

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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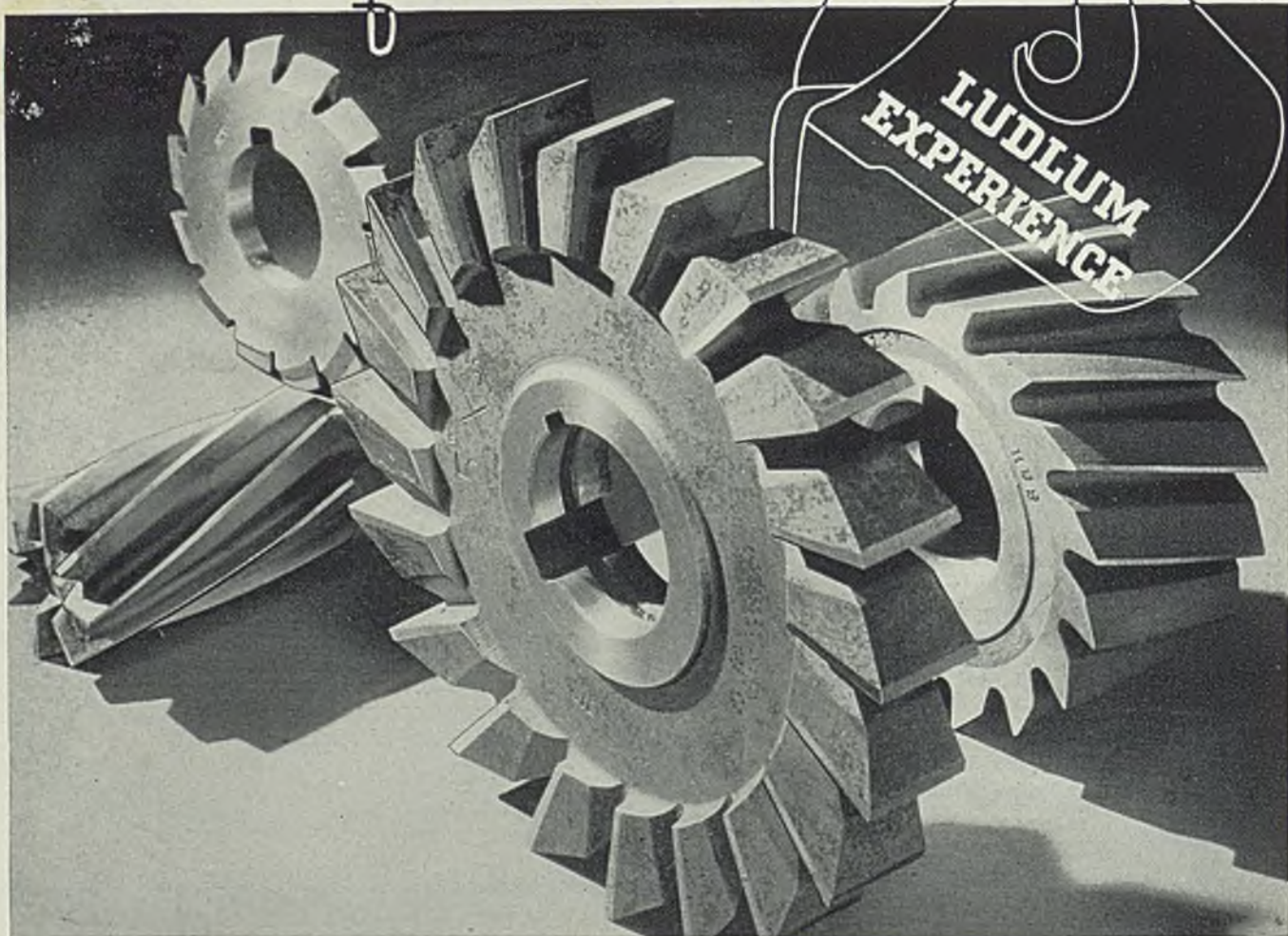
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STEEL

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As the Editor Views the News

IN SPITE of the atmosphere of general satisfaction and good will which has been created by numerous favorable developments since election day, there are indications that difficult problems lie obscured under the pink haze of the moment. Sooner or later the realism of the labor relations and the public relations problems will burst through the enveloping mist to challenge the best that we can muster in tact and diplomacy. Fortunately, industry is pursuing new tactics, which, we believe, will lead to success. It is tackling the employment problem with a different spirit. Its present attitude cannot help but win public approbation.

• • •

In granting wage increases, extra pay, bonuses, etc., many industrial companies have done the obviously wise thing to meet the expectation of greater rewards entertained by their employes. However, the shower of increases by corporations able to raise wages has placed many less fortunate concerns in an extremely

Not All Can Keep Pace

embarrassing position. Thousands of companies, through no fault of their own, simply cannot match the liberality of some of the industrial giants whose announcements of dividend and wage disbursements make front page headlines. Some industries have emerged from the depression more rapidly than others. The 1936 tax law, plus this present display of largess, compounds the injustice to the unfortunate employers.

• • •

The present government administration is dominated heavily by the influence of organized union labor. Perhaps we do not have a labor government in the strict sense, but we have the nearest approach to it in the history of this nation. The administration, by virtue of its fondness for NRA, obviously favors regimentation and standardization in industry. This implies that all companies—regardless of peculiar local conditions or special factors characteristic of the in-

Labor Is Riding High

dustries to which they belong—shall be subject to uniform demands. Undoubtedly this is the new dealers' justification for a renewal of the NRA plan. It also fits the specifications set forth by John Lewis for horizontal industry unions. The elements of uniformity, regimentation, etc., will appear prominently in labor-sponsored legislation in the next congress. Much of it will be a headache to conscientious employers.

• • •

With these disturbing contingencies ahead, industry must make up its mind as to how it will act. It can be stubborn and aloof, or it can try to co-operate with the administration. In spite of all of the manifest difficulties involved, the majority of industrial executives seem to feel that a co-operative spirit should prevail.

Don't Lose By Default

This publication (p. 35) believes that every effort should be made to work with, instead of against, the tide of public opinion. For industry to sulk and stand aloof means absolute domination of the federal administration by organized union labor. To assume the role of a good sport, and to try to help the government in dealing with its difficult problems may open the way to a more satisfactory solution.

• • •

No industrial plant can maintain an enviable record of accident prevention unless its responsible officers are constantly guarding against the hazards encountered in materials handling operations. Education and instruction of the men engaged in handling materials and systematic inspection of equipment (p. 45) are the fundamental necessities for a low accident rate. . . . A careful check of the oil lubricated bearings in many manufacturing establishments probably would reveal many instances of incorrect design. The location of oil holes and distributing grooves (p. 38) in relation to the maximum pressure area has much to do with the efficiency of the lubricating oil or grease. . . . An unduly high friction load on a bearing is not always due to faulty lubrication. One manufacturer discovered that the trouble (p. 61) lay in V-belts adjusted to fiddle-string tightness.

Keep Accident Rate Down

E. L. Shaner

Debate Merits of Wage Scale; More U. S. Steel Units Sign

ARGUMENTS for and against the sliding scale method of adjusting wages were heard in the steel industry last week, while the United States Steel Corp. went ahead regardless of objections from some of its employes and put its plan in effect.

Arguments against the use of the cost of living index as a wage determinant came from E. T. Weir, chairman, National Steel Corp., whose main point was that it will tend to "chain" rates and hold down the standard of living.

It was no secret that other independent steelmakers do not favor the Steel corporation's system; none has followed it, though in advancing wages 10 per cent Nov. 16, practically all said they expect to make further adjustments "when warranted."

For the sliding-scale principle—but a scale based on sales prices instead of living costs—appeared Michael F. Tighe, president of the Amalgamated Association of Iron, Steel and Tin Workers.

Tighe takes a position diametrically opposed to that of John L. Lewis and his followers who have seized control of the Amalgamated, and who from the first have scoffed at the Steel corporation's sliding scale.

Tighe referred to the sliding-scale idea as one which B. F. Jones, one of the founders of Jones & Laughlin Steel Corp., negotiated with the Sons of Vulcan—Amalgamated's predecessor—fifty years ago.

Weir States His Case

Said Mr. Weir:

"In our own case, after negotiations with our employes' representatives a wage increase was arrived at which was mutually satisfactory. We didn't close the door to future negotiations about wages and we did not peg an increase or decrease to the cost of living.

"There are always factors to be considered in changing wages other than the cost of living. I cannot subscribe to the theory of chaining wages to living cost because if carried to its natural conclusion this arrangement would halt future advances in standards of living.

"In the past 40 years we have witnessed a great and general improvement in living standards. Many things have contributed to this, but fundamentally the improvement has

been due to a steady and favorable 'spread' between wages and living cost.

"As I see it any attempt to permanently establish the living cost index as the sole barometer for wage adjustments would tend to retard the continued increase in real buying power which has been and should be the goal of all industry."

Writing in the current issue of the *Amalgamated Journal*, Tighe says:

"It appears that the steel corporations are now coming to realize the importance of the one particular and basic foundation upon which the Amalgamated association has functioned since its institution—the sliding scale.

"Under the system employed by the Amalgamated association a conference is arranged with the employers' association, they meet on common ground, both sides fortified with their own particular knowledge of the business in which they are engaged. They place their cards openly and freely on the table, and while the question of the cost of living is one of the subjects of discussion, it is

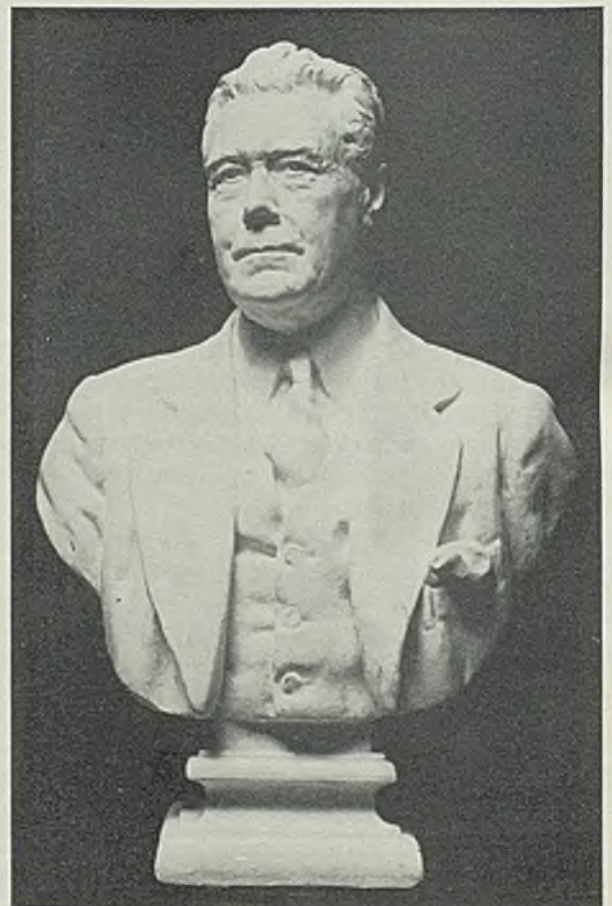
secondary to the particular and most important one, which is based on the selling price of the material produced.

"Ever since the founder of the present corporation, Mr. Ben F. Jones, as president of the Jones & Laughlin Co., instituted the sliding scale in his dealings with the Sons of Vulcan, this method had been observed by the successor of that old and storm-tossed organization, the Amalgamated Association of Iron, Steel and Tin Workers. No one who has any knowledge of economics has questioned the wisdom of the method by which wage rates were adjusted.

"While we are convinced that the best interests of both the steel corporations and employes will be served by dealing directly with the Amalgamated Association of Iron, Steel and Tin Workers, if they are not at present ready to do so, then we would advise that they take a pattern from the Amalgamated association in dealing with such questions."

Carnegie-Illinois Steel Corp. announced that since its proposed wage agreement was approved at a great majority of its plants and by the employes it would become effective in all its mills. Employes in the Edgar Thomson, Duquesne and Farrell-Mercer works division, in the Pittsburgh district, and the Gary tin and Gary steelworks divisions in the Chicago district, who held out

◆
Myron C. Taylor, chairman, United States Steel Corp. From a bust made recently by the noted sculptor, Frederick MacMonnies. Friends say it is an excellent likeness. Dorr photo
◆



against the agreement now find themselves receiving the higher wages without having signed a contract for a year.

Of the 18 Carnegie-Illinois plants in the Pittsburgh-Youngstown area, 15 were on record as approving the contract. The last two to agree were the Youngstown works, with 7500 employes, and the Vandergrift works.

STEEL PENSION SYSTEMS TO BE MODIFIED

Revisions in existing industrial pension systems neared the announcement stage last week as iron and steel executives scrutinized the social security act's old age pension program, which becomes operative Jan. 1 and to which the steel industry will contribute \$7,210,320 next year, on the basis of present payrolls.

A special committee of the United States Steel Corp. has been studying the problem for many weeks. The extent of changes in the present setup has not yet been indicated, but it was said that every effort will be made to keep benefits to Steel corporation employes on a parity with present standards.

In 1935, the Steel corporation paid out \$7,901,748 in pensions to 12,559 persons. The average pension per month was \$55.90. On the basis of the corporation's present payroll it would contribute \$3,235,140 to the government program next year. Employes will pay an equal sum. No pensions will be granted until 1942. From 1 per cent of the payrolls next year, the government program calls for an increase to 3 per cent in 1949.

BEST OCTOBER SINCE '29 IN METAL TRADES EMPLOYMENT

Metal trades employment in leading cities increased during October to the highest level for that month since 1929 and to the best rate for any month since June, 1930, according to the National Metal Trades association, Chicago. The October index of 91.9 compares with 90.1 in September, and with 76.6 in October, 1935. The largest increase was shown at Detroit where automotive operations stimulated employment.

Spring Merger Proposed

Standard Steel Spring Co., Coraopolis, Pa., in proposing to acquire all assets of Blood Bros. Machine Co., Allegan, Mich., has called a special meeting of its stockholders in Pittsburgh Nov. 24. The Standard company plans to exchange unissued shares on a share-for-share basis for each of the 13,756 shares of the Blood Bros. stock outstanding.

Improve Public Relations, Train Men, Founders Urged

FRIENDLY and sympathetic relationship between government and business is the first need of the business man and of government itself, declared Thomas W. Pangborn, president, at the fortieth annual convention of the National Founders' association in the Waldorf-Astoria hotel, New York, Nov. 18-19.

The theme of Mr. Pangborn's presidential address was: "What kind of government does the business man want?"

In addition to a sympathetic and understanding government, he said,



Franklin R. Hoadley
Elected president, National Founders'
association

the average business man wants a government that is honest, efficient and effective, one that understands its functions and discharges them, but which also understands its limitations and respects them. The business man wants a government which calls into its councils the best men it can get and makes it possible for them to stay on the job without loss of self respect; moreover, a government which practices and teaches economy.

Mr. Pangborn stated that industry has understood its functions better and has done a better job than government. He thought industry is doing a better job of selling itself to the public than it has ever done before, though the task is a large, difficult and continuing one.

He endorsed wholeheartedly the "good neighbor" policy of the federal government in relations to other countries. But, he added, the "good neighbor" policy should begin at

home. Any domestic policy which ignores the mutual inter-dependence of the American people is fraught with peril.

"We cannot safely legislate on the basis that there is a natural antagonism between labor and management; between debtors and creditors; between farmers and city people; or between business and government itself.

"That was the fundamental fault in the NRA and AAA. It lies at the root of the Wagner labor act, which was based entirely on the mistaken idea that American wage earners shared the conception of 'our enemy, the employer', as held by William Green, head of the American Federation of Labor.

"American business should again be free to resume its cycle of producing more and better goods for more people to use and enjoy. That is the American method of producing the more abundant life."

Shortage of Skilled Labor

Commissioner A. E. McClintock in his report referred to the association's strong financial position and to an increasing membership, which now includes 315 plants.

The commissioner pointed to an increasing shortage of skilled help and urged members to do their utmost in training new apprentices. The recent survey of the membership of the industry revealed that the average age of the men now employed was 48 years. It is important, therefore, that young men be brought into the industry and given proper training. Improved business in the industry has stimulated the activities of outside labor organizers.

Pointing to a definite change in the trend of American affairs, Dr. Virgil Jordan, president, National Industrial Conference Board Inc., New York, urged American industry to center its attention on its primary function of producing goods and rendering business service.

He warned industry to keep its head and not contribute to another speculative boom. "If it loses its head now, it will do it literally when the next depression comes," he declared.

He believed the trend, as indicated by recent elections, is decidedly toward a centralized form of government. He enumerated various steps pointing in that direction. Productivity, he said, is the one essential in the success of whatever course is ultimately followed.

Arnold Lunn, of the faculty of the

University of Notre Dame, speaking on the "Communitistic Peril in Europe," said that due to "muddle headedness" communism has become a real threat, not only in Europe, but also in the United States. Communists, he declared, have traded on the reluctance of the public to give the necessary time and thought to study of the problems. He advocates public debates between speakers of groups opposed to communism and speakers accredited by the Communist party as a means of bringing the issues before the public.

The issues involved in the CIO drive have not been defined clearly, J. A. Voss, director, industrial relations, Republic Steel Corp., said in his address on "Industrial Relations." Employee representation is the best method of solving problems between the groups, because the men are familiar with the problems, and are sympathetic with the difficulties faced by employers.

Whiting Williams, Cleveland, speaking on "Getting the Co-operation of Employee-Citizens," said that during the depression "people searched for some new law or device to settle differences between industry and labor, but co-operation, the establishment of mutual trust, still is fundamental."

In the past few years, and especially since efforts are being made to organize the mass production industries, "we have been witnessing a national, historic competition between employers and employees. This competition is a selling contest, with the organizers on the one hand, and industry on the other. In the long run employees will gain more if employers win the contest."

C. J. Stark, president, Penton Publishing Co., Cleveland, publisher of STEEL, *The Foundry*, and

other industrial papers, spoke on "Today's Business and the Public." He said:

"Our resources in both skilled personnel and in national wealth, and our guarantee of individual opportunity within a free democracy have made this essentially a business nation. Our home market provides and will continue to provide the greatest outlet for the products of our farms and factories in all the world.

"It is unthinkable that the American public knowingly will impose such handicaps and restrictions upon so beneficent an instrument as modern business in their daily lives and welfare as to interfere with its proper functioning in their behalf. It is beyond belief that any sane or politically minded government no matter how intent upon social reform will deliberately rob industry of those voluntary, self-generating powers without which it cannot hope to prosper and progress.

Industry Faces Great Problem

"It is well to bear in mind that no government ever created good business through its own acts; furthermore, that no government can ever hope to be successful politically without good business. On this perhaps we may take a leaf from the results of the recent national election.

"Then, what is the great problem

that the management of business and industry faces in the light of these new conditions? Isn't it to take the public more and even more into its confidence as to its affairs in order that its problems, its objectives and the conditions under which it must be conducted to flourish and to grow, may be understood and better evaluated in terms of the public good?

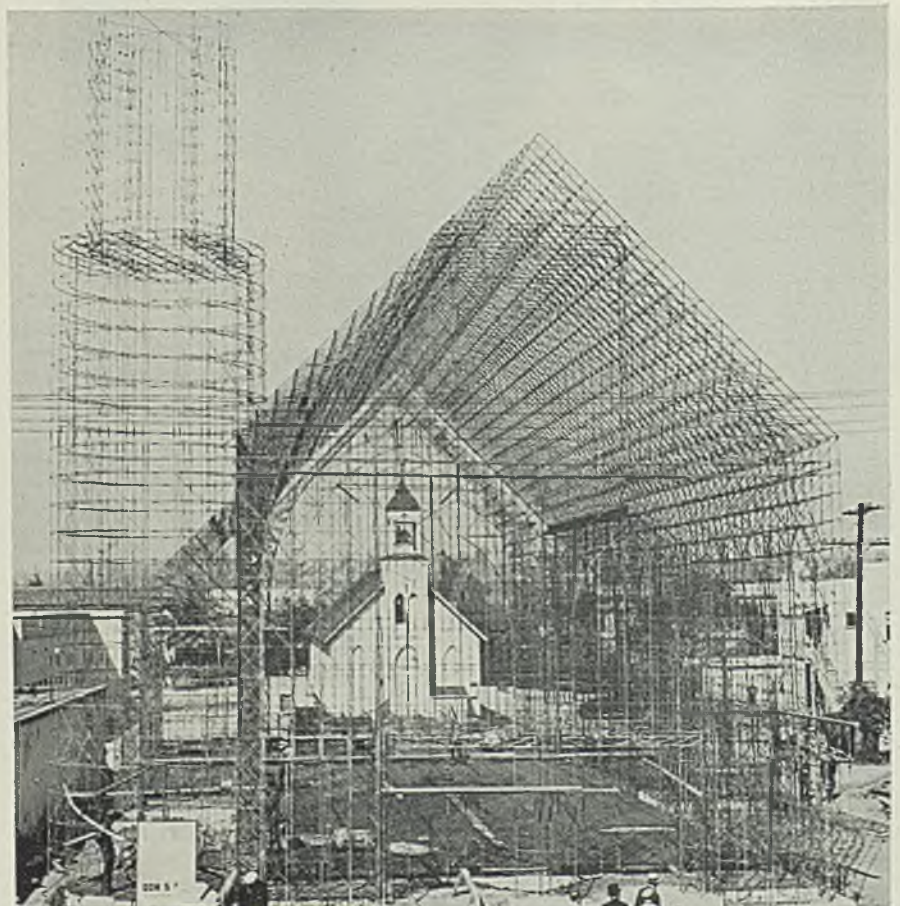
"What a tremendous force for education and understanding would accrue if all business and industry could be mobilized and would make the preservation of an informed and wholesome public opinion an essential duty of successful management!

"Business owes it to itself to see that it is better understood by the public as a matter of simple justice to its employes . . . to its stockholders . . . and above all as a patriotic duty to the country as a whole."

Franklin R. Hoadley, Farrel-Birmingham Co., Ansonia, Conn., was elected president of the association, succeeding Mr. Pangborn. H. D. Hammerstadt, Rockwood Mfg. Co., Indianapolis, was elected secretary, and J. M. Taylor, Chicago, secretary-treasurer. Mr. McClintock was re-elected commissioner.

The closing session was devoted to technical papers, which will be referred to in subsequent issues of STEEL.

Huge Web of Steel Forms Frame for Church



SSMALL steel rounds interwoven into panels of 12 x 20 feet and arc-welded at all points form walls, roof and floor of this church building in Culver City, Calif. The exterior will be finished with gunite on metal lath and the interior with plaster over metal lath. Fabrication is under the patent of A. M. McLellan, Los Angeles. Resistance to fire, earthquake and termites is claimed. Arrangement of the steel results in a compensating framework, distributing stresses, it is said

Wide World photo

Expect Gains in Foreign Trade

WHILE optimistic over the growing volume of international trade, speakers at the twenty-third National Foreign Trade convention, held last week in the Stevens hotel, Chicago, emphasized the need for counteracting economic nationalistic policies. More than 1000 delegates attended.

James A. Farrell, former head of the United States Steel Corp. and chairman of the National Foreign Trade council and the National Foreign Trade association, stated that international trade has lagged behind domestic recovery because of the restraints imposed by economic nationalism.

Bargaining powers of the United States constitute a chief influence in overcoming the remaining obstacles to the recovery of foreign markets, according to Mr. Farrell.

Speaking of the trade agreements effected by this country, he said that they "will be found upon examination to be a logical method by which to increase our exports, with reasonable assurance of payment for these goods.

Sees Return to Stability

"To what extent and in what directions the disturbing influences of post-war dislocations have changed the character of the world economy is a question frequently debated. The tendency, however, to drift away from the world economy appears to have reached its pinnacle. The trade agreements with Canada and France, and subsequent developments in new currency alignment, seem to presage a return in substantial measure to the stable conditions of pre-war years.

Discussing the export outlook with reference to countries engaged in industrial development, Mr. Farrell asserted that "one effect of the rise of these new industrial countries has been to increase our exports of machinery and equipment and all classes of heavy industries. The present tendency of these countries to develop their domestic industries by curtailing imports restricts the outlet for the products of older industrial nations. Experience of the past shows, however, that trade is greatest between industrial countries because of the higher purchasing power of the industrial worker and that the movement of goods in international trade is affected but little by tariff barriers.

"With the elimination of prohibitive customs regulations, quotas, exchange restrictions, and other unreasonable restraints, especially

those of a discriminatory character, American industry has little to fear in respect to competitive advantage in foreign markets."

Lewis E. Pierson, chairman of the Irving Trust Co. of New York, told the convention that relief from economic pressure which now hampers foreign trade may lead to a period of unexampled prosperity.

"Removal of the shackles on foreign trade through international co-operation should well repay the world in terms of improved business, a higher standard of living, more tranquil political and social conditions, and lessened dangers of war," Mr. Pierson said.

Silas H. Strawn, former president of the United States chamber of commerce, declared that isolationists who take the position that the United States can afford to be practically self-contained are overlooking the interests of the country.

Business Pledges Washington Aid

BUSINESS and industry last week pledged co-operation to the Washington administration.

In Washington Myron C. Taylor, chairman, United States Steel Corp., and Charles R. Hook, president, American Rolling Mill Co., attended the meeting of the business advisory council called by Secretary Roper.

At the conclusion of the meeting George H. Mead, Mead Corp., Dayton, O., sent this communication to the secretary: "In our advisory capacity we accept the responsibilities placed upon us by the President and by you, and we pledge to you our full co-operation in seeking those objectives which you so clearly express."

President Roosevelt in a message to the council asked that special studies be made of the problems of re-employment, wages and living conditions.

"We will, I hope," he said, "pass into the next period of our administration by looking to a wise and more equitable balance of the inter-related segments composing our economic and social life. To that end the business advisory council can render definite service."

Following the meeting, C. M. Chester, president, National Association of Manufacturers, in a public statement said: "In every respect I am confident that the manufacturers will agree with President Roosevelt's suggestion, and do everything possible to re-employ workers above 40 years of age as a part of the re-employment program."

Patman Measure Adjusts Tin Plate

TO CONFORM with provisions of the Robinson-Patman price bill, tin plate manufacturers last week announced abolition of the 7½ per cent discount for quantities of tin plate, effective Jan. 1.

This discount, which had been in effect since the N.R.A. steel code, had meant the granting of 39 and a fraction cents off the present official market on tin plate, which is quoted \$5.25 per base box, f.o.b. Pittsburgh.

Thus, sellers of tin plate will quote a uniform and flat price on plate to consumers, regardless of size. They will, however, adhere to their small quantity extras which apply on lots of 10 base boxes up to 100 base boxes. Lots over 100 base boxes do not take a quantity extra.

These extras quote 25 cents over base per 100 pounds, or per base box, for lots of 10 to 50 boxes. An extra of 10 cents up is quoted for lots in the bracket of 50 to 100 boxes.

At the same time tin plate sellers named their contract price for 1937 and occasioned some surprise, in view of rising steelmaking and administrative costs in the industry, by extending the market at \$4.85, per base box, Pittsburgh.

Expect Tin Plate Rise

Recent advances in the price of tin, cost of administering the social security act, increased taxes and higher steelmaking costs in the form of an advance in semifinished steel were all factors pointing to an increase on finished tin plate.

However, many can companies have inferred that advances in the price of tin plate would, from a competitive standpoint, force them to turn to other materials for a replacement. In the matter of beer cans for example, a recently won field for tin plate, there was likelihood that many canners and breweries would have to return to glass containers if tin plate costs were advanced.

The same is true in regard to other competitive materials such as fiber and paper where tin plate makers are constantly fearful of losing ground.

Ship Pig Iron by Barge New Orleans to Chicago

Federal Barge Line's first solid cargo from New Orleans to Chicago reached Memphis last week. It consisted of seven steel barges carrying 9000 tons of sulphur and pig iron.

Production

STEEL production gained fractionally last week to average 74½ per cent, due largely to heavier operating schedules at Youngstown, Chicago and eastern Pennsylvania. Pittsburgh, Cleveland and Wheeling districts were off slightly.

Pittsburgh—Down 1 point to 67 per cent, based on a 1-point loss to 63 per cent for United States Steel Corp. subsidiaries, and a fractional gain to 78 per cent for independents. A leading independent is operating at a new 1936 high at about 77 per cent. A new high in steelworks blast furnace production has been recorded, with 44 out of 60 now in blast, a gain of one by the Pittsburgh Crucible Steel Co. with its second Midland, Pa., blast furnace now on.

Youngstown—Up 3 points to 73 per cent, as the Farrell plant of Carnegie-Illinois Steel Corp. resumed after a shutdown of 48 hours, and the company's Ohio works added another open hearth to operate 14. Preliminary schedules indicate a fifteenth furnace will be put on at the Ohio works this week, but operations will probably sag several points due to suspension of Youngstown Sheet & Tube Co.'s bessemer furnace for a week or ten days because of ample ingot stock.

Central eastern seaboard—Up fractionally to 48 per cent, with little change expected this week.

St. Louis—Unchanged at 68 per cent. Schedules at steel casting plants are at the highest of the year, and will continue at present levels for the next few weeks.

Cleveland—Off 1 point to 79½ per

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended		Same week	
	Nov. 21	Change	1935	1934
Pittsburgh ..	67	— 1	46	21
Chicago	76½	+½	61	33
Eastern Pa...	48	+½	39	20
Youngstown..	73	+ 3	56	35
Wheeling ...	89	— 3	78	54
Cleveland ...	79½	— 1	80	46
Buffalo	84	None	37	24
Birmingham..	74	None	46½	25
New England	73	None	93	55
Detroit	100	None	94	48
Cincinnati ...	96	None	†	†
St. Louis	68	None	†	†
Average ...	74½	+½	54½	29

†Not reported.

cent, with Corrigan, McKinney division of Republic Steel Corp. operating 12 of 14 open hearths, Otis Steel Co., all 8, and National Tube Co. at Lorain, 11 of 12.

Chicago—Increased ½ point to 76½ per cent, a new high rate for the year to date. Only slight fluctuations are expected during the balance of this quarter. Twenty-five of 38 stacks are active. Lighting of additional furnaces is anticipated next month.

Cincinnati—Steady at 96 per cent, with 23 open hearths active. Any fluctuations the remainder of this quarter will be for servicing reasons only.

New England—Held at 73 per cent, with indications that the rate will jump to 88 per cent this week.

Buffalo—Maintained at 84 per cent, and no major revision is

planned until after the close of navigation.

Birmingham, Ala.—Held at 74 per cent, with 16 open-hearth furnaces on active schedule.

Detroit—Unchanged last week at 100 per cent, based on production in all 21 basic open-hearth furnaces.

Wheeling—Down 3 points to 89 per cent, with 33 out of 37 open hearths in the four district plants melting.

SHEET PRODUCTION UP

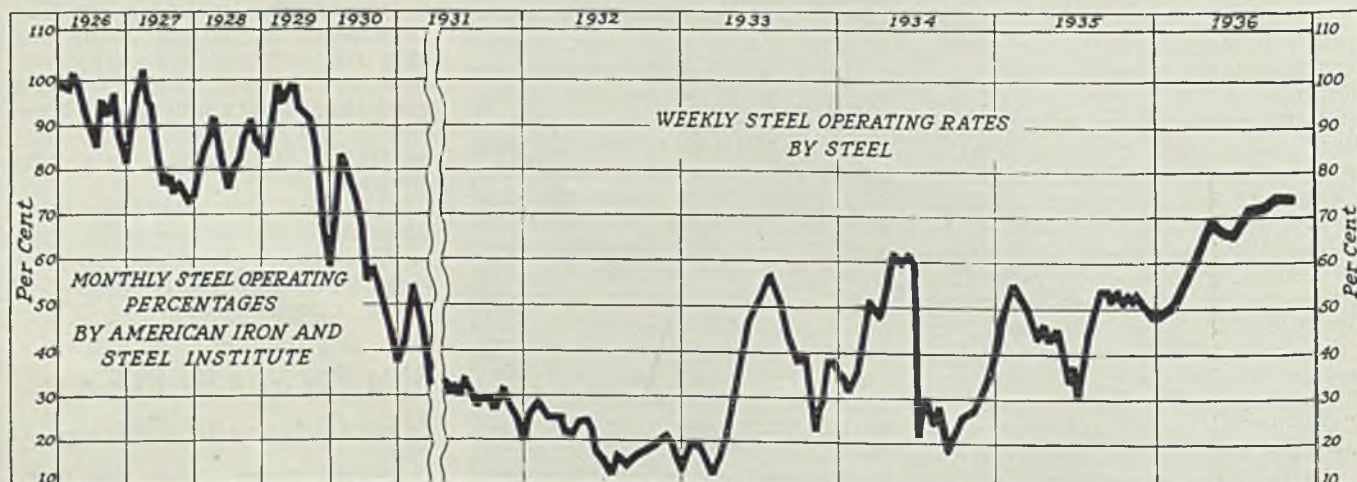
Daily average sheet sales in October, as reported by the National Association of Flat Rolled Steel Manufacturers, Pittsburgh, amounted to 7439 net tons, compared with 8519 in September. Production averaged 7835 tons, against 7124 tons in September, while shipments were 7462 tons in October and 6810 tons in September. Totals for October: Sales, 223,195 tons; production, 235,057 tons; shipments, 223,874 tons.

2000 Tons of Steel in PWA Refrigerator Order

An order for 16,697 electric refrigerators has been placed with Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., by PWA. They will be installed in 34 slum clearance and low rent housing projects in 26 cities.

Requirements for this order will be close to 2000 tons of steel, 1250 tons for the cabinet and accessories and 750 for the motor and cooling unit. This is said to be the largest single order of its kind ever placed and will total well over \$1,000,000.

Steelworks Operations Hold Within 70 to 75 Per Cent Range for 18 Weeks



FOR the past 18 weeks steel operations have held steadily in a range of 70 to 75 per cent, a longer steady rate of operation than in any year since 1929. Toward the close of 1935 for 15 weeks operations held within 51 to 54½ per cent. The curve for 1936 is exceptional in showing an almost uninterrupted rise from close to 50 per cent at the beginning to 74½ per cent, the present level

Sheet & Tube Begins Ten-Million Expansion Project

A BROAD program of plant improvements and betterments, designed to increase and improve the company's finishing capacity and efficiency of operations, is announced by the Youngstown Sheet & Tube Co.

This includes installation of new equipment, and improvement of existing equipment in the company's plants in the Youngstown and Indiana Harbor districts. The projects now going forward will cost \$10,000,000.

In the Campbell plant, Youngstown, another four-high continuous cold steel mill will be added to present cold rolling facilities, increasing cold rolling capacity by about 15,000 tons a month. Contract for this mill has been awarded to Mesta Machine Co., Pittsburgh. Additional normalizing, annealing, pickling, and other equipment for rounding out finishing facilities will be included.

The new mill completes the company's program of rehabilitation of its strip sheet producing facilities begun with the building of its continuous hot strip mill two years ago.

A reversing mill for rolling of rounds will be installed at the company's Brier Hill plant in Youngstown, to improve the company's pipe facilities. This mill, which will have a capacity of 35,000 tons a month and will produce rounds up to 14 inches in diameter, will supplant existing facilities for rolling rounds at the Campbell plant, where sizes and tonnages were restricted.

Other improvements include rehabilitation of finishing facilities of the seamless tube plant, including new upsetting and threading equipment, at the Campbell plant, and completion of the company's cold-rolled tin mill and other projects now under way at Indiana Harbor.

Three new buildings are included in the program. The new cold mill will be housed in a building 120 x 900 feet. New buildings will also house the seamless mill improvements at Campbell and the new round mill at Brier Hill.

Ludlum Steel Co. Spending \$1,095,000 on Its Plants

Appropriations for plant improvements during 1936 by the Ludlum Steel Co., Watervliet, N. Y.,

now total \$1,095,000 as a result of recent expenditures approved by the directors, employees were informed in a letter last week.

The plants at Dunkirk, N. Y., and Watervliet have been allocated \$370,000 for improvements, in addition to the \$315,000 appropriated early in the year. For the plants of subsidiary companies at Wallingford, Conn., and Detroit \$400,000 has been appropriated. Most of the money will be spent to increase capacity.

Stockholders already have received a dividend of \$1 a share, and another dividend of 25 cents a share will be paid payable Dec. 21 to stockholders of record Dec. 7, the employees were advised.

For Christmas, salaried employees will receive compensation amounting to 5 per cent of their respective salaries received over the last six months of this year. Effective Dec. 1 the company will make a further substantial increase in wages to all hourly employees, details of which will be announced later, the letter said. The increase will represent an "equitable distribution of a total increase equivalent to approximately 10 per cent of the payroll to all hourly employees and will take into consideration the varying adjustments in base rates which have been made or are now in progress in the various operating departments."

Propose Trade Groups Counsel Government

Featuring the annual convention of the National Paint, Varnish and Lacquer Association Inc. in Chicago last week was a proposal by John R. MacGregor, vice president, Eagle-Picher Lead Co., Cincinnati, for this body to take the leadership in organizing representatives from every trade association to advise Washington on industrial legislation. The resolution won unanimous approval.

Rep. Wright Patman, and Edwin S. George, Dun & Bradstreet Inc., discussed the purpose and probable future of the Robinson-Patman act.

"I doubt that any law on the statute books has more effective provisions for its enforcement than this law," said Patman. "It has three sets of biting teeth: the federal trade commission, the depart-

ment of justice, and any private concern that has cause of action."

Mr. George believed that the bill could not have been passed "had not thousands of business men been sympathetic, or at least tolerant, of its general purpose." He forecast more legislation of this kind, but said that business "need not go into a state of panic . . . for business is not an unrelieved aggregation of evil practices."

First New Blast Furnace in 8 Years

INLAND STEEL CO., Chicago, is considering an addition to its pig iron producing capacity and shortly is expected to award contracts for the building of a blast furnace. The company currently has four stacks with an annual capacity of 1,003,000 gross tons. Four new open-hearth furnaces recently were built, adding 300,000 tons to the company's steelmaking capacity.

The blast furnace will be the first to be built in the United States since 1928. Since 1918 only 20 stacks have been erected, and in this time 203 have been abandoned, 167 remodeled. Total annual capacity now is 49,777,893 tons, compared with 48,626,115 tons in 1918.

Sees World Gains for Porcelain Enamel in 1937

Increased building construction and modernization throughout the world will augment the use of porcelain enamel on steel next year, said Robert A. Weaver, president, Ferro Enamel Corp., Cleveland, after conferring with managers of Ferro companies in France, Holland, England, Australia, Canada, Brazil and the Argentine, last week.

The foreign representatives brought word of increasing interest in porcelain enamel on steel as a building material and of the spread of the porcelain enamel bath tub.

Among the foreign managers were Glenn Hutt, Australia; F. M. Hartford, Argentina; Dudley Clawson, Brazil; William Marshall, England; Major Wilfrid Mavor, Canada; Georges Desurmont, France, and Zeno Deuvorst, Holland.

Porcelain enamel on steel for United States construction work alone now totals more than \$1,000,000 a year. The modern kitchen, with its electric refrigerator, range, dishwasher and appliances, and the bathrooms of the nation account for another \$15,000,000 annually.

Acetylene Convention Cites Need for Widespread Education in Industry

A LARGE attendance greeted the opening of the thirty-seventh annual convention of the International Acetylene association in Hotel Jefferson, St. Louis, Nov. 18. Members from many sections of the country were on hand to take part in the program, intended to bring out the results of recent research and to acquaint users with the possibilities of the oxyacetylene process.

Dr. A. B. Kinzel, chief metallurgist, Union Carbide and Carbon Research Laboratories, reported briefly on the twelfth annual International Acetylene and Allied Industries congress held in London last June. Emphasis at this meeting, he said, was placed on welding rather than cutting.

Following his presidential address, C. O. Epperson, vice president, Keith Dunham Co., and National Cylinder Gas Co., Chicago, proceeded to the formal award of the Morehead medal, bestowed annually in recognition of outstanding service to the oxyacetylene industry. On this occasion it was given to Dr. David S. Jacobus, Babcock & Wilcox Co., New York, because of his leadership in the formulation of codes and procedures which have made fusion welding acceptable.

Trade Literature Needed

Presiding over the general industries session, A. E. Gibson, vice president Wellman Engineering Co., Cleveland, and president, American Welding society stressed that welding is still in its infancy. Technical papers were presented by I. T. Hook, American Brass Co., Ansonia, Conn., and Eric Oberg, editor, *Machinery*, New York. Mr. Hook described procedures used in welding cupronickels and silicon copper alloys, while Mr. Oberg detailed advantages to the machine designer which are made available through the use of welded construction.

Keynote address by Philip W. Swain, editor, *Power*, New York, cited the need in the welding industry for technical literature which might give the average American all he needs to know about the processes of the industry.

Featuring a number of papers covering the use of oxyacetylene process in numerous applications, the heavy industries session was called to order by Julian D. Conover, secretary, American Mining congress, Washington. R. G. LeTourneau, president, R. G. LeTourneau Inc.,

Peoria, Ill., discussed uses of oxyacetylene in cutting steel and alloy steel shapes in the manufacture of heavy dirt-moving equipment.

Cutting and preparing steel plate for use in building cars was covered by B. F. Orr, superintendent of car shops, Cleveland, Cincinnati, Chicago & St. Louis railroad, Beech Grove, Ind., in a paper read by Thomas Quinn of that organization.

Construction and maintenance work in the metal mining industry requires extensive application of the oxyacetylene process, according to H. R. Wass, St. Joseph Lead Co., Bonne Terre, Mo. Prepared by G. Stuart Jenkins, general superintendent, Consolidated Coal Co., St. Louis, a paper describing effects of modernization and mechanization of coal mines was read by G. C. Conway of that company.

Charles H. Ellaby, United States engineering department, St. Louis, declared engineers who design large

ADDITIONAL news of the steel and metalworking industries will be found on pages 95 and 96.

steel structures feel there is a lack of available data on welded structures and incline toward use of riveted construction. One of the high spots of the meeting was a trip to the plant of Midwest Piping & Supply Co., St. Louis, where guides explained operations.

The association elected the following: president, D. W. Gibson, Air Reduction Sales Co., New York; vice president, Elmer H. Smith, Commercial Gas Co., Minneapolis; secretary, H. F. Reinhard, New York; treasurer, Henry Booth, Shawinigan Products Corp., New York; directors, C. O. Epperson, National Cylinder Gas Co., Chicago; H. S. Smith, Union Carbide Co., New York; W. C. Keeley, National Carbide Corp., New York; H. B. Dolisie, Canadian Liquid Air Co. Ltd., Montreal.

James I. Banash in his report as consulting engineer said that while acetylene equipment is provided with all possible safeguards the fire curve is mounting with the improvement in business, and he recommended an intensive campaign to

get users to observe safety precautions.

Twenty-one new members have joined the association in the past year.

Welding and cutting round table discussions held at Soldan high school Thursday evening proved one of the best educational features ever developed by the association. Some 600 users of the process in the St. Louis district attended eight simultaneous sessions, where their questions about the use of the process were answered by 34 of the country's best known authorities.

Financial

YOUNGSTOWN Sheet & Tube Co. declared the regular quarterly dividend of \$1.37½ per share on its preferred shares. To apply against \$17.87½ per share of preferred dividends in arrears the company also declared a dividend of \$8.25 per share payable Dec. 15 to record of Dec. 5. This will reduce arrears to \$9.62½ per share. Directors called \$5,000,000 3½ convertible debentures for redemption on Dec. 22, at par and accrued interest, plus 4 per cent premium.

Inland Steel Co., Chicago, has declared a special dividend of \$1.50 a share, payable Dec. 17 to stock of record Dec. 1.

Blaw-Knox Co., Pittsburgh, declared a dividend of 35 cents per share, payable Dec. 18 to record of Nov. 27. This will make a total of 80 cents paid this year.

Allis-Chalmers Mfg. Co., Milwaukee, declared an extra dividend of 50 cents and a quarterly dividend of 37½ cents, both payable Dec. 24 to record of Nov. 30.

Mullins Mfg. Corp., Salem, O., declared an initial dividend of 50 cents on both class A and B common stock, payable Dec. 21 to record of Nov. 28.

Freight Rate Hearings To Begin Jan. 6

Interstate commerce commission will begin hearings Jan. 6 on the railroads' petition for new freight rates to take the place of the present rates and surcharges. The commission last week denied the railroads' request to vacate the present rate orders so that they might immediately file the revised tariffs.

The hearings beginning Jan. 6 will consider the propriety of the rates proposed. Present surcharges were due to expire Dec. 31, but probably will be extended until the commission has decided the issue.

ket on semifinished is currently based on \$32, Pittsburgh, for rerolling billets, sheet bars and slabs, and \$37 for forging quality billets, with \$40 and \$42 the respective wire rod bases.

Scrap

Scrap Prices, Page 87

Pittsburgh—Consumers' participation in scrap last week had dwindled nearly to a vanishing point. The proportion of unprepared material which mills here have been receiving since the market's advance has increased considerably. With no sizable sales of test, No. 1 steel for local delivery at \$17 to \$17.50 is unchanged and largely nominal. On the contrary, the participation of a district electric furnace interest in low phos scrap through large purchases has held this market firm and steady at around \$21. Machine shop turnings at \$11.50 to \$12 are under the handicap locally of restricted shipments at several important points.

Chicago—Despite lack of interest on the part of steelworks in making new commitments for heavy melting steel, the market here continues strong. Dealers and brokers find only a limited tonnage of this grade available at \$16.50, and prices paid in covering contracts range up to \$17. Some additional mill buying is looked for despite the announced intention of some consumers to stay out of the market for the balance of the year.

Boston—Further revisions have been made in buying prices of scrap in New England, No. 1 heavy melting steel for export gaining 25 cents a ton to \$12.25, and heavy breakable cast for domestic consumption being quoted down 25 cents to \$9.75. Pittsburgh mills are coming back into the market for a small amount, but generally new business is slow. Foreign demand is still weak.

Philadelphia—Mixed trends are noted in scrap, although prices are still on the easy side. This is particularly true of cast scrap, which is coming out more freely than in a number of weeks. Heavy melting steel also is easy with the leading buyer picking up some scattered tonnages for Bethlehem, Pa., and Sparrows Point, Md., at the new offerings noted last week of \$14 and \$13.50, respectively. Incidentally, this buyer for No. 2 has offered \$1.50 under the market on No. 1 steel. There has not been sufficient buying at lower prices, however, to result in a change from current levels.

Some sellers of scrap are less disposed to part with material than

they were a week ago, in the belief that consumption is due for an increase in view of probable price advances for first quarter. Incidentally, one buyer of foundry specialties has recently closed on good tonnage for his various plants in anticipation of further expansion in railroad equipment requirements. The fact that this buyer has covered for the time being, at least, is taken as an indication that the low point has been about, if not definitely, reached on these specialties at this time.

New York—Some new business is developing from eastern Pennsylvania. Demand from foreign sources still is quiet, although brokers' prices for material for export have been revised, some classifications being advanced and others lowered. Interstate commerce commission has permitted Delaware & Hudson, Baltimore & Ohio, Delaware, Lackawanna & Western, Lehigh and Pennsylvania railroads to reduce rates on scrap iron and steel shipments over certain routes in New York to meet competition of the state barge canal, from May 1 to Nov. 30. The reduction is from \$3.78 to \$3.43 on shipments from Albany, Troy, Watervliet and Schenectady to Buffalo.

Buffalo—Dealers expect early sales of No. 1 heavy melting steel but admit they have been unsuccessful in efforts to obtain a higher bid. Little has been sold at the last offer of \$16 for tonnage and contracts have been generally with the intention of shipping other materials. Minor weakness in other markets will be offset by the closing of navigation at this port, dealers believe.

Detroit—Open-hearth grades still fail to indicate much of a price trend last week and in the absence of buying activity, were without quotable change. A \$13.50 to \$14 market on No. 1 steel and unchanged prices on other open-hearth grades, are for the most part nominal. On the other hand, cast scrap and low phos specialties are moving briskly.

Cincinnati—A strong undertone exists in the iron and steel scrap market despite recent sales, aggregating more than 5000 tons, at prices below post-election expectations. Dealers continue bullish, little material is available at current bids to apply on contracts and yard stocks are being built up.

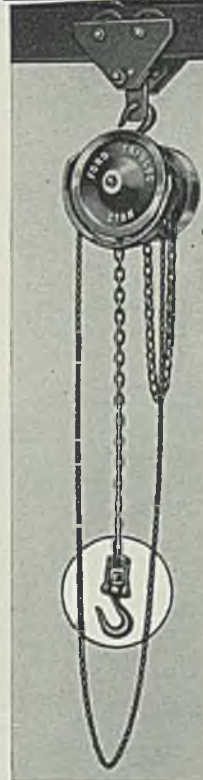
St. Louis—Iron and steel scrap continues strong with advances recorded on some items, mainly steel specialties and heavy melting steel, while buying has subsided since the purchase of 12,000 tons by East side mills early in the month, demand is strong and all industries would purchase if prices were lower.

Birmingham, Ala.—Larger consumers have not been in the market

for tonnage above the ordinary but have been informed that they can get all the stock needed. Quotations are unchanged, heavy melting steel holding at \$11 to \$13. Reports are to effect that the melters have little stock on yards and can be expected to be in the market more or less steadily.

Seattle—Japan lost interest in export scrap when Pittsburgh prices dropped 50 cents this week. Exporting houses can forward commitments only from British Columbia ports. However, scrap cannot pay

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diversion charges in addition to the regular trans-Pacific freight of \$4.25 a ton. Local mills are still buying and No. 1 heavy melting steel is being maintained at \$11 per ton, f.a.s.

Toronto, Ont.—Buying and shipment of iron and steel scrap are improving. Local dealers state that there is a good market for most lines of scrap, with steel grades most active. Foundries also are taking larger tonnages of iron scrap and there is heavy demand for machinery cast. Inquiries are more numerous for scrap and some good orders have been placed recently. Prices are firm and unchanged.

Warehouse

Warehouse Prices, Page 88

Pittsburgh—Several jobbers, realizing the impending price advance in steel products, are reported laying plans for increases in inventories. Current demand holds at a steady pace, and resale prices are unchanged.

Cleveland—Distributors of warehouse products report that sales so far this month have improved over the corresponding period in October. Lighter grade materials such as sheets, strip, wire and tubular goods are most active.

Detroit—Steel jobbers here find a sizable volume of business for automobile plant maintenance work and attractive lots for fill-in purposes on production schedules. Furthermore, due to a continued presence of industrial repair work, warehouse steel sales so far in Novem-

ber have shown no decline from the first half of October.

Chicago—Sales have shown little decline so far this month, though a downward trend is anticipated during the remainder of the year. Demand is well diversified. Prices are unchanged, but prospective advances by mills indicate higher levels on warehouse items.

Boston—Warehouse sales continue to regain strength. Sheets and strip are in good demand. Suspension of activity during the November holidays by manufacturers who use warehouse commodities is expected to be reflected in the total volume of November sales.

New York—The strength displayed during late October continues during the first half of November. Releases for cold strip are becoming larger, and common black and galvanized sheets are in good demand. Most of the current buying is for immediate needs.

Philadelphia—Warehouse sales have been sustained so far this month at a better rate than anticipated. Prices are unchanged.

Cincinnati—Volume of sales from warehouse rebounded to previous levels, after an election week let-down. Sheets are exceptionally active. Prices are firm.

Seattle—The jobbing trade felt the reaction of post-election and the maritime strike, resulting in reduced volume of business last week. Local houses are making no delivery guarantees, and should the tieup continue, items urgently needed will be ordered by rail.

St. Louis—Warehouse business is holding at a steady pace. Demand

is diversified, there still being a heavier than seasonal demand from the building industry for angle bars, rods, sheets and plates. Cold finished items are reported active, and tool steel and oil country supplies are in good demand. Prices are firm.

Iron Ore

Iron Ore Prices, Page 87

Cleveland—Freezing temperature at the head of the lakes and frozen ore still adding to the trouble of vessel men all last week, forced a lineup of boats at the Duluth and Superior docks that exceeded 45 at one time.

Vessel companies are now giving serious consideration to their closing date. Most of the boats trading to the head of the lakes will probably be tied up for the winter by the end of this month.

Baltimore—Substantial ore arrivals are reported here for the period Oct. 21 to Nov. 2, inclusive. Iron ore arrivals comprised 11,000 tons from Daiquiri, Cuba, Oct. 22; 3802 tons Wyalla, Australia, Oct. 28; 11,500 tons, Daiquiri, Cuba, Oct. 31; and 21,500 tons, Cruz Grande, Chile, Oct. 31.

Manganese ore arrivals included 15,000 tons from Colombo, Ceylon, Oct. 26; 7400 tons Poti, Russia, Oct. 24; 1500 tons, Calcutta, India, Oct. 28; 8460 tons, Poti, Russia, Oct. 29; 4050 tons, Poti, Russia, Oct. 29; 8270 tons Takoradi, Gold Coast, Africa, Oct. 30; and 5000 tons, Calcutta, India, Nov. 1.

Chrome ore included 5700 tons from Fethiye, Turkey, Oct. 29. Ferromanganese arrivals included 400 cases from Yokahoma, Japan, Oct. 21; 251 tons, Ymuigen, Holland, Oct. 29; and 300 cases from Tokio, Japan, Nov. 2.

Steel in Europe

Foreign Steel Prices, Page 88

London—(By Radio)—For the fourth time this year Great Britain has established a new high record in production of steel ingots and castings. October output was 1,060,500 gross tons, compared with 1,027,000 tons in September, an increase of 33,500 tons. In March and April new all-time marks were set, only to be exceeded in September and again in October.

Pig iron production in Great Britain also increased in October, with 670,300 gross tons from 113 blast furnace stacks, compared with 650,800 tons from 111 furnaces in

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September. This is a gain of 19,500 tons.

Shortage of pig iron in Great Britain is becoming acute and exports have been stopped. Hematite makers on the east coast are out of the market. Some consumers have offered premiums to obtain supplies. The steel market continues active and export demand is increasing. However, domestic requirements absorb the greater part of the output. Sheet export trade is disappointing.

The Continent is receiving excellent inquiry and is making sales to the Far East, North and South America. Many steelworks on the Continent are booked full until January.

Metallurgical Coke

Coke Prices, Page 85

Graceton Coal Mining Co. Inc. Graceton, Pa., which was recently formed to take over the properties of the Graceton Coal & Coke Co., is tentatively planning resumption of operations in a number of available beehive coke ovens which have not been used for a considerable time. United States Fuel & Iron Co. is preparing to fire coke ovens at the Alicia, Pa., No. 1 plant under lease from the Monessen Coal & Coke Co., a subsidiary of Pittsburgh Steel Co. Such preparations to resume production clearly confirm the continued scarcity of furnace coke which, for the beehive grade, is ranging firmly at \$3.75 to \$4 a ton, f.o.b. ovens, and for common foundry brand, \$4.25 to \$4.50. Inasmuch as blast furnaces are taking all available by-product coke, a number of integrated steelworks have retired from the open market on by-product coke for domestic use in the coming season.

Cokemakers at Chicago find November shipments the heaviest for the year, at steady prices. At Cincinnati a slight recession is noted because of heavy buying late in October.

Ferroalloys

Ferroalloy Prices, Page 86

New York—Ferromanganese shipments this month will show little falling off from October, according to leading sellers, who further declare that they would not be surprised to see shipments in December even exceed the current rate. This latter speculation is based largely on the probability that higher prices of finished steel, which now appear highly probable for first quarter, will drive in considerable steel tonnage over the re-

mainder of this year, with a resultant higher consumption of alloys. Sellers of domestic spiegel-eisen look for much the same trend with respect to their products, and for the same reason. Prices on ferromanganese are \$75, duty paid, Atlantic and Gulf ports and on domestic spiegeleisen, 19 to 21 per cent, \$26, Palmerton, Pa., on lots up to 50 tons, and \$24, on 50 tons and over.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 85

Changes in demand are slight. Farm equipment manufacturing is accounting for small gains, but freight car builders are not increasing purchases. Requirements of the latter and of railroad shops remain in fair volume, however. Demand from miscellaneous users is steady and is contributing to a fairly substantial total in shipments to all consumers. Instability still characterizes prices for bolts and nuts, published prices being only nominal. Rivet quotations are fairly steady.

Nonferrous Metals

Nonferrous Metal Prices, Page 86

New York — Nonferrous metals experienced a fourth consecutive week of seething activity last week although the former tense price situation was relieved. Export copper eased while tin quotations recovered after a sharp drop around

midweek. Lead and zinc were firmly established at levels \$2 per ton above those prevailing at the end of the previous week.

Copper—The foreign copper situation seems to be under better control with production under the restriction agreement stepped up 10 points to 105 per cent of standard tonnages which means that monthly output will approximate 70,000 tons. Prices declined to around 10.45c, c.i.f. European ports, while the domestic market held firm at 10.50c, Connecticut. Steady prices and quiet buying here are now expected over the immediate future.

Lead—Prices advanced \$2 per ton Tuesday to 4.95c, East St. Louis, the highest level attained since Jan. 3, 1931. Tone of the market continued strong and with sellers limiting sales the outlook favors still higher levels.

Zinc—Prime western was firmly established at 4.95c, East St. Louis, as the week opened and continued to maintain a strong undertone at the end of the period. Sellers were reluctant to take business at the going market and rumors of at least a 15-point rise were numerous. The industry's statistical position is the strongest in years.

Tin—The vertical rise in tin prices was temporarily checked Wednesday and the market broke sharply when the International Tin committee lifted export quotas 15 points for the fourth quarter of this year. Prices tended higher thereafter due to the scarcity of spot supplies. Straits spot closed around 53.25c.

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Great Lakes Steel Tanker Placed by Standard Oil

Standard Oil Co. (Ind.), Chicago, has awarded a contract to the Manitowoc Ship Building Corp., Manitowoc, Wis., for an oil tanker with a capacity of 2,750,000 gallons for delivery by the opening of navigation in the spring of 1937, at a cost estimated at \$1,000,000. The vessel will be 465 feet in length, with a 55-foot beam, and a depth of 28 feet, and will require about 3000 tons of steel, largely plates.

The motive unit, a triple expansion surface condensing engine of 2500 horsepower, will be supplied by steam at 200 pounds pressure from two of the largest Scotch boilers ever built on the Great Lakes, by the shipbuilding company's affiliate, Manitowoc Boiler Works. The huge propeller will be cast in manganese bronze.

The Manitowoc yards built its first tanker for Standard Oil of Indiana in 1929-'30, named the E. G. SEUBERT in honor of the president of the company, and having a capacity of 2,100,000 gallons. The new tanker will have a riveted hull with welded bulkheads and welding will be used largely elsewhere, requiring considerable re-equipment of the Manitowoc yard shops with electric welding units and other machinery. John E. Thiell is secretary of the shipbuilding company.

Basis for Figuring Cost Of Tungsten Carbide Tools

Following a recent price reduction for cemented tungsten carbide tools and blanks to 45 cents per gram Super Tool Co., Detroit, has issued a bulletin showing by sketches the basis for figuring prices.

The bulletin states: For all purposes the calculated weight of a cemented carbide blank shall be the weight of a right geometrical figure in which the blank can be inscribed, without deductions of any kind. The density for calculations is 240 grams per cubic inch. The right geometrical figures are: A parallel piped, all surfaces of which are rectangles; a prism, the end surfaces of which are right triangles and the side surfaces of which are rectangles; a solid right circular cylinder; a hollow right circular cylinder, the inner surface of which is a coaxial right circular cylinder.

Russia Sends Pig Iron

Leading importations at Philadelphia during the week ended Nov. 7 were 3125 tons of chrome ore from Cuba and 2953 tons of pig iron

from Soviet Russia. Other arrivals included 92 tons of steel tubes, 41 tons of steel bars and seven tons of steel forgings, all from Sweden.

McKinley Campaign Cards Were Tin Pie Plates in '91

In a political campaign 45 years ago pie plates produced votes far better than speeches and literature, according to Hayward Niedringhaus, president, Granite City Steel Co., Granite City, Ill.

Made from some of the first tin plate manufactured in this country, 100,000 of the pie plates were distributed by William McKinley at meetings throughout Ohio during his successful campaign for governor of that state in 1891.

McKinley was capitalizing on the tariff act of 1890 which he introduced as congressman, and which levied a duty of 2.2 cents per pound on imported tin plate. Prior to 1890 most of this nation's tin plate came from Wales, where labor costs were lower, according to Mr. Niedringhaus, but one year after the tin plate clause had been put in the tariff act, 20 mills were operating in the United States and ten more were being built. At the close of 1897 there were 60 mills in operation. Today there are 672.

"In 1891 only 50 tons of tin plate were produced in the entire United States," pointed out Mr. Niedringhaus. "In 1935 the total for the entire country amounted to 1,870,000 tons."

McKinley came in person to order the pie plates, and it was a rush job, said A. W. Niedringhaus, production manager of the Granite City company. Each of the pie plates was inscribed: "American Tinplate 1891—Made by St. Louis Stamping Co." The Granite City Steel Co. formerly was the Granite Iron Rolling Mills which was a part of St. Louis Stamping Co.

Tests Show Ancient Iron Not From Meteors

One of the mysteries of the famous piece of iron found in the Great Pyramid apparently has been cleared up as a result of a controversy between English archeologists, indicating that iron was smelted in Egypt much earlier than previously believed.

Christopher Hawkes, writing in the September issue of *Antiquity*, a quarterly review of archeology, reveals the results of tests made in the British museum laboratory in November, 1926, and in April, 1932, showing that the Pyramid piece, a "thin film of metallic iron with a

more or less thick coating of its oxides," dating from about 2900 B. C., contained no nickel. Neither could nickel be detected in another piece of iron, from Abydos, dating from about 2500 B. C.

Since most iron of meteoric origin contains nickel, the tests apparently show that iron occasionally was smelted in the Near East as early as the third millenium B. C.

Mr. Hawkes was replying to G. A. Wainwright, who in the March issue of *Antiquity* said that "although an occasional piece of iron may be found, it was not until the fifteenth century that one may expect to meet with iron here and there in Egypt. Actually Egypt was the last country of the Near East to enter the iron age." Mr. Wainwright questioned whether the Great Pyramid and Abydos pieces were of terrestrial or meteoric origin.

The report on the chemical analysis bears the stamp of authority, according to Harry C. Richardson, Republic Steel Corp., Cleveland, whose studies of ancient metallurgy were published in *STEEL*, Feb. 18 and 24, and March 4, 1935. A plausible theory, according to Mr. Richardson, is that Egyptians occasionally obtained small pieces of iron through the smelting of Nubian gold.

Equipment

Pittsburgh—Mesta Machine Co. has received a contract from Bethlehem Steel Corp. for construction of a new 56-inch continuous mill with an annual capacity of 600,000 tons, to be built at the Sparrows Point, Md., division of the company. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has received a contract covering the electrical equipment for the mill. The aggregate of both contracts is expected to exceed \$25,000,000.

Chicago—With machinery and equipment buying holding to an active rate, sellers anticipate good business during the remainder of the year. Railroads give promise of increasing their purchases of shop equipment materially in 1937, following five to six years of restricted buying. Most recent inquiries from the carriers will not be acted upon until next year. While few large lists have appeared in the machine tool market lately, activity has been supported well by a relatively large number of smaller inquiries. Small tool demand continues good, being spread among a diversified list of industries.

Seattle—Seasonal restrictions are affecting demand although volume of turnover has been maintained this year in larger proportion than usual.

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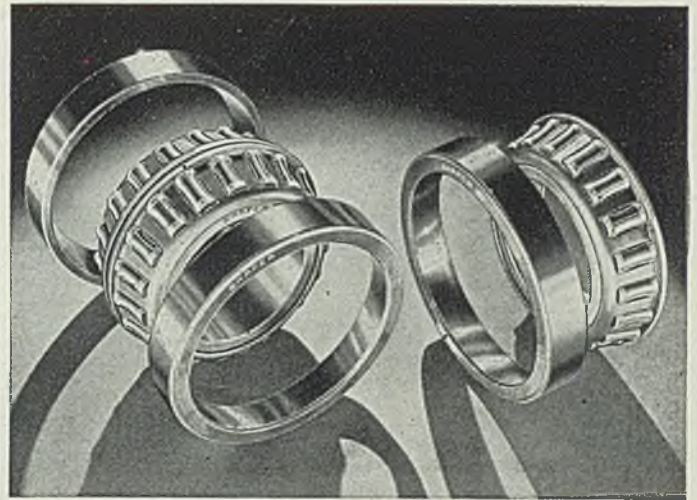


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Construction and Enterprise

Ohio

BARBERTON, O.—City is having plans prepared for its \$420,000 sewage disposal project. Harry W. Alcorn is city engineer; Barstow & LeFeber Inc., 31 North Summit street, Akron, are consulting engineers. (Noted Nov. 2.)

BEDFORD, O.—City is taking bids, due Nov. 20, for construction of trunk sewer, ejection station and force main. Other contracts will follow. (Noted Oct. 19.)

BLOOMVILLE, O.—Village approved bond issue of \$20,000 at November election, and is having plans prepared for construction of waterworks system, including well supply, pump house and elevated steel tank. Cost is estimated at \$50,000. Champe, Finkbeiner & Associates, 1025 Nicholas building, Toledo, are consulting engineers. (Noted Sept. 28.)

BUCYRUS, O.—City voted approval of \$75,000 appropriation for construction of sewage disposal plant. Total cost is estimated at \$140,000, remainder to be supplied by PWA. American Solvent Recovery Corp., 83 South High street, Columbus, is survey engineer.

CANTON, O.—Milcor Steel Co., Milwaukee, is having plans drawn for new buildings as part of its program for further expansion of factory here.

CARROLLTON, O.—Village, board of public affairs, plans construction of sewage disposal plant and system. Bond issue of \$50,000 approved by voters. Arnold, Rosch & Hartline, New Philadelphia, O., are consulting engineers.

CENTERVILLE, O.—Village has completed plans for construction of waterworks system, including pump house, vertical pumps, supply line and services. Cost is estimated at \$115,000. Bond issue for this purpose approved at November election.

CIRCLEVILLE, O.—Voters approved bond issue of \$75,000 for construction of sewage disposal plant. William J. Graham is mayor.

CLEVELAND—City, division of water and heat, department of public utilities, city hall, is taking bids, due Nov. 20, for miscellaneous parts for repairing stokers in power plant boilers.

DAYTON, O.—Phillip Kravitz Bag Co. has moved to quarters in Bucher building at 420-26 Burns avenue and will install new equipment.

DAYTON, O.—War department, air corps, office of contracting officer, Wright field, will take bids until Dec. 1 on fabricating and furnishing structural steel in accordance with air corps drawing No. 47-147-1, invitation circular 37-337, delivery f.o.b. Wright field, and until Dec. 2 for one motor-driven band saw, to operate on 220-440-volt, 60-cycle, three-phase A. C., invitation circular 37-338; and for miscellaneous steel and iron wire, invitation circular 37-336.

EDON, O.—Village approved bond issue of \$23,000 at November election, for construction of waterworks. W. C. Bingham is clerk.

GALION, O.—Voters approved \$60,000 bond issues at November election for construction of sewage disposal plant.

L. C. Cline is service director; American Solvent Recovery Corp., 83 South High street, Columbus, is survey engineer. (Noted Oct. 5.)

LIMA, O.—City is taking bids, due Nov. 24, for furnishing pump valves for slow pumping engine at main pumping station. Cost is estimated at \$3600.

MARIETTA, O.—Crystal Dairy Co. is enlarging its plant at Third and Church streets. Additional building will contain retail business, storage facilities and extra equipment.

MINSTER, O.—Village is having preliminary plans prepared for construction of elevated tank and tower, main reinforcements and pumps. Champe, Finkbeiner & Associates, 1025 Nicholas building, Toledo, are consulting engineers.

NILES, O.—Niles Rolling Mill Co. has placed contracts for construction of additional 3-high breakdown mill and continuous furnace and additional finishing mill and continuous furnace. Equipment is to be installed before the end of the year.

OVERLIN, O.—Village bond issue of \$20,000 for proposed street lighting system was approved by voters at November election. Mr. Zahm is city manager.

PLEASANTVILLE, O.—Village voted in favor of \$15,000 bond issue for construction of waterworks. E. M. Wildermuth is clerk.

PORT CLINTON, O.—Ohio National guard, Columbus, will readvertise for bids on construction of steel water tank and tower at an estimated cost of \$10,903.

PORT CLINTON, O.—Village has postponed referendum on question of issuing \$219,000 power plant bonds until special election Feb. 2, 1937. Fred Slauterbeck is mayor, Burns & McDonnell Engineering Co., Kansas City, Mo., is consulting engineer. (Noted Oct. 19.)

SANDUSKY, O.—Apex Electrical & Mfg. Co., 1070 East 152nd street, Cleveland, has purchased Holland-Rieger Co. Inc., and plans expansion here.

SMITHVILLE, O.—Village share of proposed waterworks system finances, amounting to \$16,000, approved by voters at November election. Project will cost \$78,000. H. M. Yoder is mayor. (Noted Oct. 19.)

SOUTH CHARLESTON, O.—Village is having preliminary plans drawn for \$80,000 municipal light plant. C. D. Juvenal is mayor; Collins Wight, Union Trust building, Dayton, is engineer.

ST. CLAIRSVILLE, O.—Village will receive bids Nov. 23 for construction of sewage and treatment plant. Cost is estimated at \$200,000. Jennings-Lawrence Co., 538 Rowlands building, Columbus, is consulting engineer; C. D. Bradfield is mayor.

WESTERVILLE, O.—Village is preparing plans for construction of additions and repairs to sewage disposal plant. Ross E. Windom is manager; Jennings-Lawrence Co., 538 Rowlands building, Columbus, is consulting engineer.

WILLOUGHBY, O.—J. H. R. Products Co. will construct fireproof sheet steel kiln building to replace the one de-

stroyed by fire recently. Cost is estimated at \$10,000. (Noted Nov. 9.)

WOODSFIELD, O.—Village is preparing plans for construction of sewage and garbage disposal plant at an estimated cost of \$39,000. Eugene Smith is mayor; Jennings-Lawrence Co., 538 Rowlands building, Columbus, is consulting engineer.

Michigan

ADRIAN, MICH.—City officials have been ordered to submit plans by March 1, 1937, for secondary sewage disposal system estimated to cost \$60,000, by state stream control commission.

BATTLE CREEK, MICH.—City is completing plans for water supply system, including additional wells, pump house, pumping equipment, mains and meters; should be ready for bids about Nov. 16.

DETROIT—Harvey Goldman & Co., 10567 Grant avenue, has been incorporated by Harvey H. Goldman, 16575 Edinborough avenue, to deal in machinery.

DETROIT—Detroit Vapor Stove Co., 12345 Kercheval street, has awarded boiler pipe contract for addition to its power plant to Hickey, Shaw and Winkler.

DETROIT—Yard and shops of Currier Lumber Co., Van Dyke and East Davison avenues, were destroyed by fire Oct. 28. Loss is estimated at \$200,000.

DETROIT—National Automotive Fibres Inc. has awarded contract for \$100,000 plant addition to O. W. Burke Co. Hugh Millar is architect.

DETROIT—Barnes-Gibson-Raymond Inc. has been formed to deal in metal products. Correspondent is Associated Spring Corp. of Delaware, 6400 Miller avenue.

DUNDEE, MICH.—City must submit plans for secondary sewage disposal system by May 1, 1937, to state stream control commission.

GRAND RAPIDS, MICH.—American Box Board Co., 470 Market street S. W., plans construction of \$125,000 warehouse, 350 x 75 feet, to be erected on Godfrey avenue S. W.

GRAND RAPIDS, MICH.—Proos Mfg Co., 324 Page street N. W., has been organized by Neal Proos, 419 Carrier street N. E., to manufacture stampings.

KALAMAZOO, MICH.—U. S. Foundry Corp., 2200 Lane boulevard, has been formed by Edwin Doerschler, 1205 Staple avenue, to manufacture castings.

MUSKEGON, MICH.—Anaconda Cable & Wire Co. has awarded general contract for construction of plant addition to Strom Construction Co., Grand Rapids. Cost is estimated at \$40,000.

MUSKEGON, MICH.—Norge Corp. suffered damage by fire estimated at \$200,000.

HULBERT, MICH.—J. Sheperd Parrish Co., 222 North Bank drive, Chicago, woodenware manufacturer, has started reconstruction of three factory buildings destroyed by fire.

RIVERVIEW, MICH.—Dixie Refining Co. is receiving bids for construction of refinery, to be located here, at a cost of about \$800,000. Paul R. Kempf, 312 First National Bank building, Ann Arbor, is president.

Illinois

BROADVIEW, ILL.—American Vault Works Inc., Forest Park, Ill., is erecting \$60,000 plant, 175 x 131 feet, at Gardner road and Twenty-first street. A. W.

(Please turn to Page 106)

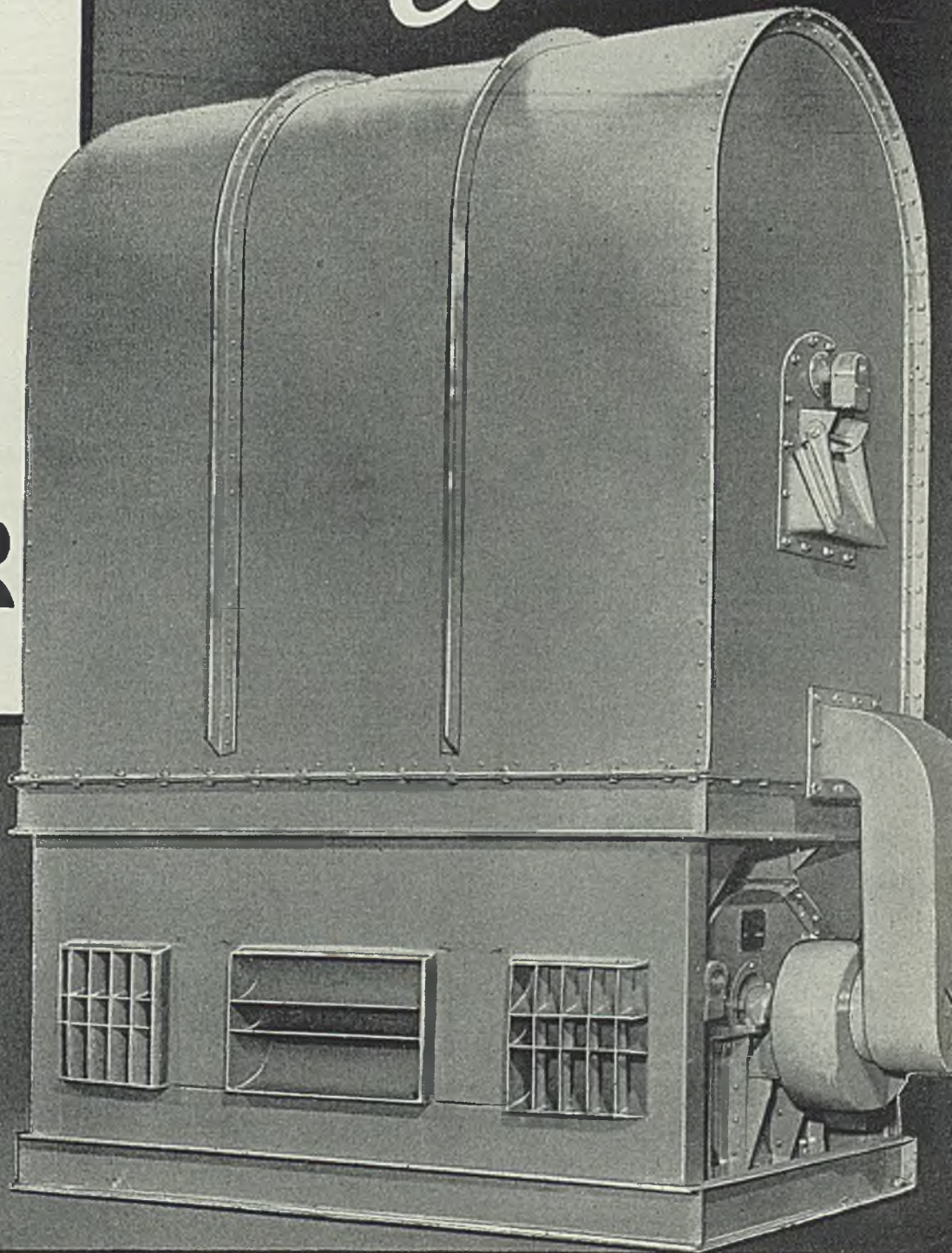
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(Continued from Page 104)

Komarek & Co. Inc., 11 South LaSalle street, Chicago, are builders and architects.

CHICAGO—Dole Valve Co., 1901-1935 Carroll avenue, suffered a loss estimated at \$5000 from explosion in air-conditioning plant.

CHICAGO—Ace Metal Fillings Co., 10 North Clark street, has been incorporated by C. M. Field and associates to manufacture, cut and thread metal products. Milton H. Weiss and Edward W. Weiss, 10 North Clark street, are correspondents.

DEKALB, ILL.—Northern Iron & Metal Co., 604 South Fourth street, has been incorporated by T. Gordon and associates, to deal in iron, metal and building material.

GENEVA, ILL.—Modern Steel Equipment Co., recently incorporated by Fred L. Gurtner, 15 Rugby place, and Harvey G. Knuth, 132 Wilcox avenue, has acquired former plant of Howell Mfg. Co. at 722 James street, and is modernizing and re-equipping building.

ROCKFORD, ILL.—Ebaloy Foundries Inc., 605 Rockford National Bank building, has been incorporated by F. L. Mitchell and associates to engage in general foundry business. Frank A. Welsh, Rockford, is correspondent.

Indiana

GOSHEN, IND.—Penn Electric Switch Co., Des Moines, Iowa, has purchased site here and plans erection of \$225,000 plant. Bert Penn is president.

LAWRENCEBURG, IND.—Peoples Coal Co. plans construction of additions to incline and coal tippie on the Ohio river here.

Connecticut

NEW BRITAIN, CONN. — Stanley Works Inc. plans installation of electric motors, conveyors, hoists and other equipment in one-story addition to rolling mill. Cost is estimated at \$100,000.

New York

BUFFALO—City will take bids Dec. 8 for buildings and equipment for sewage disposal system; buildings to cost \$3,800,000; equipment, \$1,934,000.

JAMESTOWN, N. Y. — Chautauqua Trailer Coach Co. has been incorporated here and has taken over former Broadhead factory building on East First street. Plant will be remodeled for large-scale production of auto trailers. Rhoe Henderson is general manager; Harry S. Ackroyd, superintendent.

NEW YORK—Gerdans Products Corp. has been organized here by M. W. Markowitz, 110 West Fortieth street, to deal in machinery.

NEW YORK—Queens Bronze & Aluminum Foundry Inc. has been organized by Russel R. Kittel, 6 East Forty-fifth street, New York.

NEW YORK — Cornish Wire Co. Inc., 30 Church street, has acquired the plant of Boyd Textile Corp. and plans to convert building for manufacture of light wire, hardware and radios.

RIVERDALE, N. Y.—The metal mill of Revere Copper & Brass Co. Inc. was damaged by an explosion. Loss is estimated at \$25,000.

YONKERS, N. Y.—Hablirshaw Cable & Wire Corp. plans million-dollar addition to its plant on the Hudson river here. Ordinance will be presented to common

council to authorize sale of city-owned site.

New Jersey

TRENTON, N. J.—L. A. Young Spring & Wire Corp., Detroit, has purchased ten-acre site here and plans construction of factory building with approximately 150,000 square feet of floor space. Plant will be complete unit for manufacture of cushion springs and coat hangers.

Pennsylvania

ERIE, PA.—Metals Processing Inc. was granted state charter at Harrisburg, Nov. 10. Firm was incorporated by O. G. Hitchcock, 801 West Twelfth, and associates, to apply protective and ornamental coatings.

SHARPSVILLE, PA.—Western Steel Products Mfg. Co. will erect butt-weld tube mill here. B. A. Small is general manager.

Maryland

BALTIMORE—City board of awards will ask bids about Dec. 1 for construction of \$5,000,000 Loch Raven-Monte-bello water tunnel.

BALTIMORE—Frankford Distilleries Inc., Kresson street, is considering bids for construction of warehouse, 10 stories, 143 x 171 feet, on Willow Spring road. Carl J. Epping, 806 East Broadway, Louisville, Ky., is architect.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, Navy department, will receive bids until Nov. 20 for miscellaneous motor-driven universal tool and cutter grinders, schedule 9217, for delivery San Pedro, Calif.; one motor-driven outside planer and shaper, schedule 9218, and one motor-driven light duty engine lathe, schedule 9219, both for delivery Puget Sound, Wash.; miscellaneous motor-driven engine lathes, schedule 9222, for delivery various east and west coast points; one motor-driven squaring shear, schedule 9223, for delivery Boston; one motor-driven universal gear-hobbing machine, schedule 9232, for delivery Mare Island, Calif.; until Nov. 24 for one motor-driven horizontal boring, drilling and milling machine, schedule 9229, for delivery Puget Sound, Wash.; for miscellaneous motor-driven power hack-saws, schedule 9234, for delivery San Pedro, Calif., and Puget Sound, Wash.; one motor-driven power hack-saw, schedule 9235, for delivery Puget Sound; one motor-driven precision bench lathe, schedule 9236, for delivery San Pedro; one motor-driven turret lathe, schedule 9237, for delivery Puget Sound; one motor-driven metal cutting band saw, schedule 9238, for delivery San Pedro; one combine auxiliary air and circulating pump and spares, schedule 9239, for delivery Mare Island, Calif.; miscellaneous motor-driven sensitive drills, schedule 9244, for delivery San Pedro and Puget Sound; one 42,955-pound steel forging for propeller shaft, schedule 9248, for delivery Puget Sound.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids until Nov. 20 for miscellaneous single phase, natural draft ventilating transformers, schedule 9287, for delivery Philadelphia; one motor-driven metal cutting band saw, schedule 9266, for delivery Sewall's Point, Va.; one right-hand motor-driven band saw, schedule 9268, for delivery Philadelphia; and one double head, motor-driven, pipe and nipple threading machine, schedule 9271, for delivery Brooklyn; until Nov. 24, bids will be taken for miscellaneous motor-

driven radial drills, schedule 9243, for delivery San Pedro, Calif.; one motor generator, for plating, schedule 9246, for delivery Puget Sound, Wash.; miscellaneous motor-driven engine lathes, schedule 9249, for delivery San Pedro and Puget Sound; miscellaneous insulated electric cable, schedule 9252, for delivery various east and west coast points; miscellaneous switch boxes, schedule 9254, also for delivery various east and west coast points; one motor-driven watchmakers lathe, schedule 9256, for delivery San Diego, Calif.; one heavy duty, motor-driven engine lathe, schedule 9261, for delivery Puget Sound, Wash.; one motor-driven, screw machine turret lathe, schedule 9282, for delivery Brooklyn; one heavy duty motor-driven engine lathe, schedule 9283, for delivery Philadelphia; two motor-driven engine lathes, schedule 9285; two motor-driven riveting hammers, schedule 9286; and four motor-driven surface grinding machines, schedule 9287, all for delivery Newport, R. I. Bids will be taken until Nov. 27 for miscellaneous steel plates, sheets and strips, schedule 9277, delivery Portsmouth, N. H., and Mare Island, Calif.; and until Dec. 1 for one motor-driven universal shaper, schedule 9288, for delivery Mare Island.

Florida

MIAMI, FLA.—City commission has approved six-year program of public works improvements totaling \$36,280,000. Program includes sewage disposal plant, to cost \$6,000,000; sanitary sewers and storm drains, \$2,000,000; water supply improvement, \$5,500,000, and other improvements.

Georgia

CUMMING, GA.—Town plans waterworks improvements at an estimated cost of \$29,000. J. B. McCrary Engineering Corp., 22 Marietta street building, Atlanta, is engineer. Federal aid has been applied for.

HOGANSVILLE, GA.—United States Rubber Co., 1792 Broadway, New York, has \$12,000 two-story addition to machine shop under construction here. Company also plans for construction of shipping room. B. S. Loops, Pelzer, S. C., is supervisor of work.

Kentucky

GLASGOW, KY.—City voted bond issue of \$200,000 in November election, for construction of power plant. (Noted Sept. 21).

HENDERSON, KY.—City will open bids Nov. 24 for construction of steel or concrete cover to existing reservoir of municipal waterworks. Contract award contingent upon approval of state director, PWA; work to begin not later than Dec. 15. Westcott & Thornton, Cary building, Owensboro, are consulting engineers. (Noted Oct. 26).

MAYSVILLE, KY.—Standard Oil Co. of Kentucky, Louisville, will lay a number of short pipe lines and make wharf improvements at its property near here.

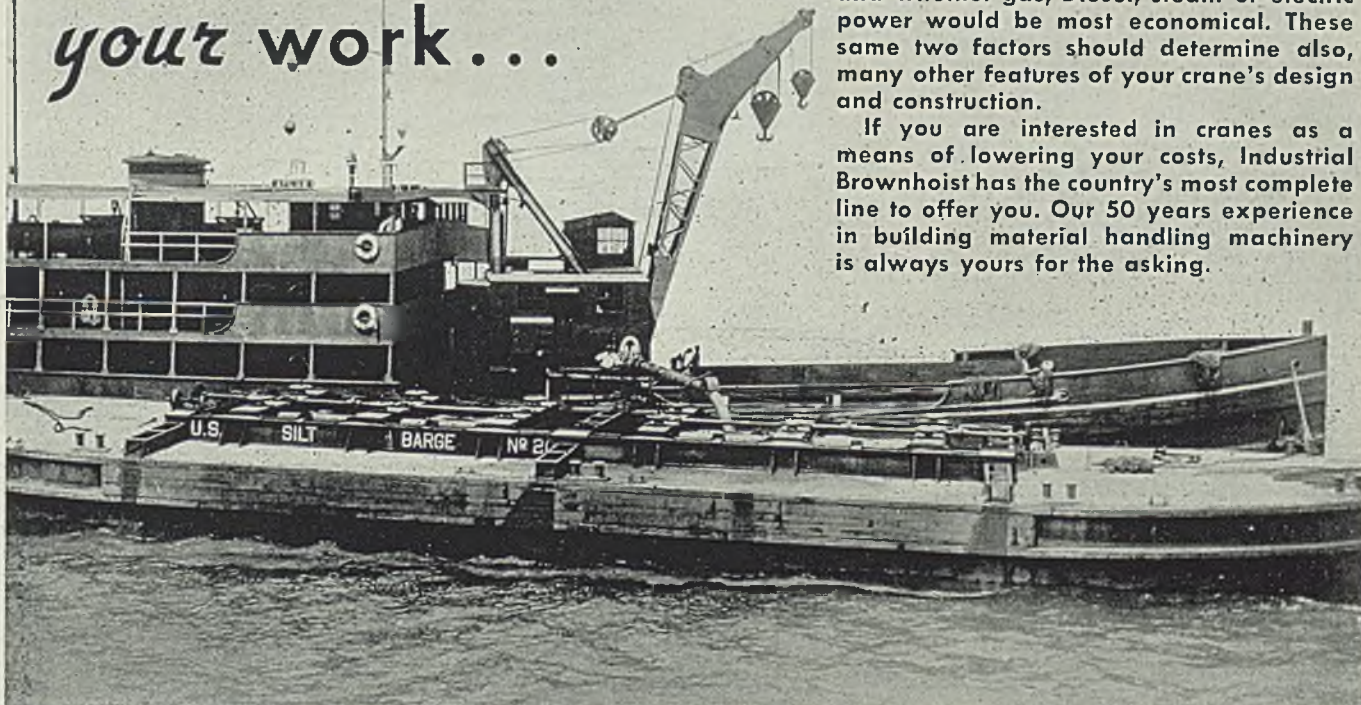
MIDDLESBORO, KY.—City voted \$175,000 bond issue and will soon complete preliminary plans for constructing electric distribution system. J. Stephen Watkins, 606 Citizens' Bank building, Lexington, is engineer. (Noted Oct. 12.)

OWENTON, KY.—City has voted \$75,000 bonds, to finance construction of power plant. (Noted Sept. 14.)

WILLIAMSTOWN, KY.—City voted in

(Please turn to Page 108)

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(Concluded from Page 106)

tavor of issuing \$72,000 bonds for construction of light plant.

Missouri

MOBERLY, MO.—Plant of Missouri Power & Light Co. here was damaged by fire recently.

Oklahoma

KINGFISHER, OKLA.—Consumers Rural Power Co., recently organized, plans rural electrification project in Kingfisher, Logan, Major and Blaine counties, including erection of power substation and 300 miles of transmission lines. Federal allotment of \$300,000 has been granted.

NEWKIRK, OKLA.—Kay county has REA allocation of \$300,000 for construction 590 miles of electric lines. Kay county electric co-operative association will be formed, with headquarters in Newkirk. Morris L. Cocke, Washington, is rural electric administrator.

OKLAHOMA CITY, OKLA.—City receives bids Nov. 24 for waterworks improvements. (Noted Nov. 9.) Frank Herrman, office engineer and designer of water department, will receive bids.

Texas

DALLAS, TEX.—D. Harold Byrd, Byrd-Frost Inc., Tower Petroleum building, plans erection of refinery in Long Lake oil field.

DALLAS, TEX.—Cass-Liberty Gasoline Co., First National Bank building, will construct \$300,000 natural gasoline plant in Rodessa field, southwest of Rodessa, La. Dudley S. Golding is president; Petroleum Engineering Co., Philtower building, Tulsa, Okla., is contractor.

HANDLEY, TEX.—Tarrant county water control and improvement district No. 2, W. C. Foster, chairman, will open bids about Dec. 1 for construction of sewage disposal plant, including installation of Imhoff tank, dry beds, chlorinator, etc. Cost is estimated at \$20,000. Hawley, Freese & Nichols, Capps building, Fort Worth, are engineers.

HOUSTON, TEX.—Russell-Hale Chemical Co., 2812 Center street, has acquired two one-story warehouses and will erect addition.

LONGVIEW, TEX.—Longview Concrete Products Co. will establish concrete plant here. Will C. Hurst is president.

Wisconsin

CLINTONVILLE, WIS.—Utility Tool & Body Co. is being organized here, to manufacture special motor truck equipment for use in construction of transmission lines. City will build initial unit of plant, 50 x 150 feet. A. A. Washburn is mayor.

OCONTO, WIS.—Oconto county electric co-operative association plans rural electrification in parts of Oconto and Marinette counties. Construction will include about 300 miles of transmission lines with substation and service facilities. E. B. Wayte, Capitol building, Madison, is chief engineer. Allotment of \$290,000 has been secured through REA.

SUPERIOR, WIS.—Arft-Killorien Electric Co., Appleton, Wis., has been awarded contract at \$90,000 for construction of 100-mile rural electrification project in Douglas county.

Minnesota

BRAINERD, MINN.—Crow Wing co-operative light and power association will take bids soon for construction of

210 miles of rural transmission lines in Crow Wing and Morrison counties. Project has been allotted \$240,000 REA funds.

MINNEAPOLIS — Crown Iron Works Co., 1229 N. E. Tyler street, coal stoker manufacturer and structural steel fabricator, has started construction on second-story addition to factory building, 21 x 74 feet. E. L. Anderson is president.

NORTHFIELD, MINN.—City is having surveys made for municipal power plant and distribution system, at a cost of \$250,000. Municipal Construction & Finance Co., Lincoln, Nebr., is consulting engineer.

NORTHFIELD, MINN.—St. Olaf college will take bids soon for construction of addition to power plant and installation of additional equipment at a cost of about \$125,000. Charles Hodgdon, 111 West Monroe street, Chicago, is architect. (Noted Sept. 14.)

North Dakota

FARGO, N. DAK.—Fargo Foundry Co. has awarded contract to T. F. Powers Co. for construction of steel warehouse, 50 x 200 feet, second-story addition to factory and general improvements to entire plant, to cost about \$40,000.

South Dakota

LENNOX, S. DAK.—City will construct waterworks at a cost of \$20,909. E. M. Godsted is city auditor; Perkins & McWayne, Sioux Falls, are architects. (Noted Nov. 2.)

RAPID CITY, S. DAK.—City plans \$125,454 waterworks system with PWA aid. A. S. Holm is city manager; Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

RELIANCE, S. DAK.—City has PWA funds for construction of waterworks system to cost \$26,365. E. K. Kentch is city clerk; Dakota Engineering Co., Mitchell, S. Dak., is engineer. (Noted Nov. 2.)

FLANDREAU, S. DAK.—City will construct power plant at a cost of \$166,770. S. L. May is mayor; John W. Emberg, Madison, S. Dak., is engineer. (Noted Nov. 2.)

WILLOW LAKES, S. DAK.—City has PWA allotment of \$40,000 for construction of waterworks system. D. M. Cook is acting mayor; Dakota Engineering Co., Mitchell, is engineer.

Iowa

DAVENPORT, IOWA—Harold D. Le Mar, Omaha, plans erection of bakery here. Cost of building and equipment is estimated at \$100,000. Bids will be taken within next 60 days. W. E. Long Co., Chicago, is architect.

GRISWOLD, IOWA — Laco Oil Burner Co. plans construction of new factory, 165 x 236 feet.

MOUNT AUBURN, IOWA — Benton county electric co-operative has been allotted \$200,000 REA funds for construction of 418 miles rural transmission lines.

STORM LAKE, IOWA — Storm Lake Packing Co. has started construction of two additions to packing plant. Cost is estimated at \$40,000.

VINTON, IOWA—Benton county electric co-operative has secured REA allotment of \$200,000 for construction of 418 miles of rural transmission lines in Benton county.

WEST LIBERTY, IOWA — Village plans purchase of additional diesel engine for municipal power plant. Charles J. Mackey is village clerk.

Nebraska

COLUMBUS, NEBR.—Loup river public power district, C. B. Fricke, president, has received REA allotment of \$2,314,000 for construction of 164 miles of transmission lines, with substations at Columbus, Norfolk, Madison, Fremont and Lincoln.

OMAHA, NEBR.—Max and Jacob Cohen, South Saint Paul, Minn., will build one-story packing plant at Thirtieth and J streets, Omaha. Cost of plant and equipment is estimated at \$175,000.

ST. PAUL, NEBR.—Howard county rural public power district, J. C. Toman, president, has been allotted \$400,000 REA funds for construction of 393 miles of rural transmission lines. H. H. Henningson, Union State Bank building, Omaha, is engineer.

STROMSBURG, NEBR.—Polk county rural public power district has secured REA allotment of \$367,500 for construction of 350 miles of transmission lines. Hemlngsen Engineering Co., Union State Bank building, Omaha, is consulting engineer.

TEKAMAH, NEBR.—Burt county rural public power district has REA allotment of \$275,000 to construct 250 miles of transmission lines. Henningsen Engineering Co., Union State Bank building, Omaha, is consulting engineer.

YORK, NEBR.—L. L. Coryell Oil Co., Lincoln, Nebr., is planning erection of warehouse and storage building here, at a cost in excess of \$50,000. L. L. Coryell is president.

Montana

HELENA, MONT.—State water conservation engineer, J. L. James, has called bids Dec. 5 for construction of Ruby dam, under allotment of \$527,275. Specifications call for 90 tons of reinforcing steel.

Idaho

SAND POINT, IDAHO—Plant of Charland Machine Co. was damaged to the extent of about \$4000.

ST. MARIES, IDAHO—City has rejected bids for proposed Rochet creek water project. All bids were over estimate of \$118,000. New bids will be asked soon.

Pacific Coast

EUGENE, OREG.—Nelson Bros., Salem, were awarded contract at \$59,128 for reconstruction of university power plant, including boiler.

ATTALIA, WASH.—General Petroleum Co., Higgins building, Los Angeles, has purchased 40-acre site here for proposed wharves and storage tanks.

CHEHALIS, WASH.—Puget Sound Power & Light Co. plans construction of 2000-KVA substation on site already acquired.

SEATTLE — Ben Herz Iron Works Co., 1327 Weller street, is restoring plant after recent fire.

SEATTLE — Idaho Gold Placers Inc., capital \$100,000, has been formed by R. L. Zech and associates, 708 Joseph Vance building.

SPOKANE — Benton county has \$35,000 REA allotment for construction of 43 miles of power distributing line.

WALLA WALLA, WASH.—Walla Walla Canning Co. plans construction of equipment, storage and blacksmith shops at local plant. F. L. Jones is manager.

Men of Industry

MARTIN L. HOPKINS has been promoted to assistant manager of sales, bolt and nut division, Republic Steel Corp., Cleveland. Frank P. McEwen will continue as the other assistant in this division.

Mr. Hopkins became associated with the Union Rolling Mill Co. in 1890, and during his association with that company became its secretary, and was in that position when it was merged with the Upson Nut Co. and Bourne-Fuller Co. in 1920. He later was elected secretary of the combined companies, and retained that title until the formation of Republic Steel Corp. in 1930. His activities with Republic have been centered chiefly on sales of bolt and nut products.

F. W. Pettit has been named assistant to M. E. Towner, general purchasing agent, Western Maryland Railway Co., Baltimore.

Leland D. O'Connell, recently manager of welding activities, has been appointed manager, Denver office, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

William Trudgian, former manager of the Denver office, has been promoted to the post of special representative, succeeding L. M. Cargo, retired.

H. W. Schmid, 1955 Ruckle street, Indianapolis, has been appointed representative in Indianapolis territory by the Ohio Electric Mfg. Co., Cleveland, for the sale of its motors.

Noah Van Cleef, Van Cleef Bros., Chicago, manufacturer of Dutch brand rubber and chemical products, will sail Dec. 8 for Australia and New Zealand, to call on the firm's distributors in these countries.

E. C. Bonia has been named eastern sales director, plumbing ware division, Briggs Mfg. Co., Detroit. He formerly was New England zone manager for Briggs. E. O. Brady, has been appointed western sales director for Briggs, with headquarters in Chicago, and R. B. Jenkins has been placed in charge of the southeastern zone, with headquarters at Miami, Fla.

Herman S. Thoenebe has been appointed director of industrial advertising, John Falkner Arndt & Co., Philadelphia, advertising agency. Heretofore Mr. Thoenebe had been connected with the engineering department, Bell Telephone Co. of



Martin L. Hopkins

Pennsylvania, Austin Co., Cleveland, and more recently was advertising manager, American Engineering Co., Philadelphia.

Arch Warner, for many years engineer and sales manager, Universal Products Co. Inc., has been made Michigan district manager of the Logan Gear Co. and the Birmingham Stamping & Tool Co., with headquarters in the New Center building, Detroit.

D. M. Pattison, sales engineer for Warner & Swasey Co. in Chicago for the past six years, has been appointed manager of the company's Cleveland sales territory. A native of Chicago, Mr. Pattison was graduated from University of Illinois in 1922 and spent three years in time study work, product and methods engineering under the Bedaux system for the Ruud Mfg. Co., Hydraulic Pressed Steel Co., and Industrial Brownhoist Corp. Follow-



D. M. Pattison

ing several years of sales and engineering work for the Federal Electric Co., Chicago, and the Wardwell Mfg. Co., Cleveland, he joined Warner & Swasey as special apprentice in 1928.

Sewell A. Avery, recently president, United States Gypsum Co., Chicago, has been elected chairman of the board. He has been succeeded as president by O. M. Knode, executive vice president. Mr. Avery had been president since 1905, while Mr. Knode has been associated with the company since 1902. Mr. Avery also is president and chairman of Montgomery Ward & Co., and a director of the United States Steel Corp.

Julian M. Avery, electro-chemical and metallurgical engineer, formerly with Union Carbide & Carbon Corp., New York, has joined the staff of Arthur D. Little Inc., research chemist and engineer, Cambridge, Mass. A graduate of Massachusetts Institute of Technology, 1918, he obtained his first practical plant experience as a lieutenant in the chemical warfare service.

Mr. Avery is a member of the Electro Chemical society and the American Institute of Mining and Metallurgical Engineers.

George B. Cushing has been promoted to manager of sales promotion, A. M. Byers Co., Pittsburgh. Mr. Cushing joined the Byers company in 1928 to organize and head the present advertising department, and subsequently in 1931 organized a technical promotion group known as the engineering service department.

B. D. Landes, who has been in the technical group since its inception, has been appointed manager of the engineering service department.

T. C. Winans, who has been in the advertising department since 1930, has been named advertising manager.

R. H. Gardner, formerly in the Washington office of the company, has been made manager of pipe sales.

Arthur M. Price, Price-Watson Co., has been elected president of the Chicago chapter of the Institute of Scrap Iron & Steel Inc., New York. Other officers elected include, first vice president, John T. McEnroe, John T. McEnroe Co.; second vice president, Max Patinken, Peoples Iron & Metal Co.; third vice president, Walter Newman, Hyman-Michaels Co.; secretary, Harvey Kaplan, M. S. Kaplan Co.; treasurer, Arthur L. Jeffrey.

Maurice D. Friedman, M. D. Friedman Co., Ashland, Ky., has been elected president of the Cincinnati chapter of the institute. Other officers are, vice president,

(Please turn to Page 32)

Automotive

Piece Name - Rear Axle

Material - SAE Steel

First Chucking Operations:

1st Sta. - Unload and Load

2nd Sta. - Drill M. Rough Turn and Rough Face

3rd Sta. - Drill Stem - Finish Turn and Rough Face

4th Sta. - Rough Face, Rough Chamfer and Rough Groove

5th Sta. - Chamfer and Finish Groove

6th Sta. - Finish Groove and Chamfer

7th Sta. - True Bore - Finish Turn and Chamfer

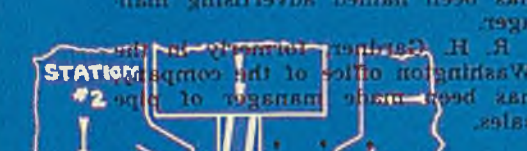
8th Sta. - Finish Turn and Ream

Time per Piece - 39 Seconds

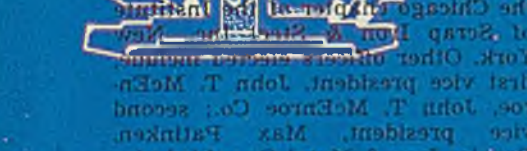
LOADING STATION



STATION #2



STATION #3



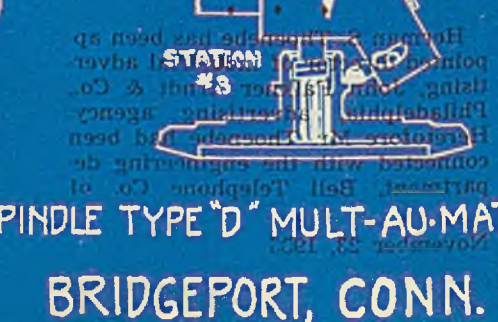
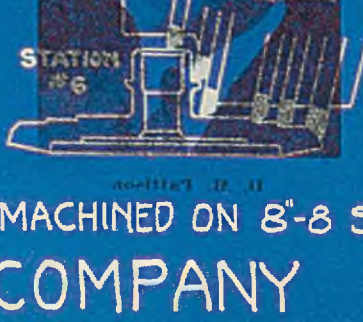
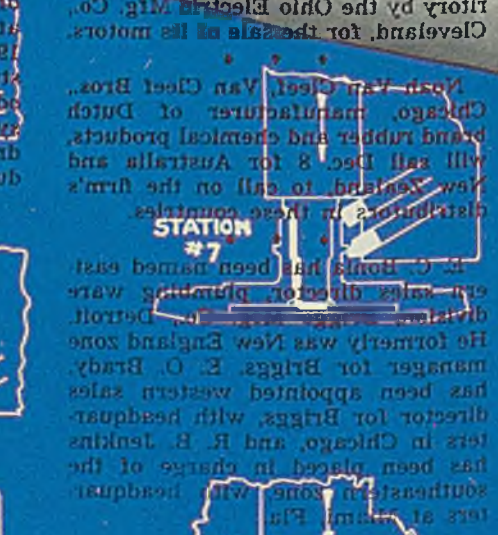
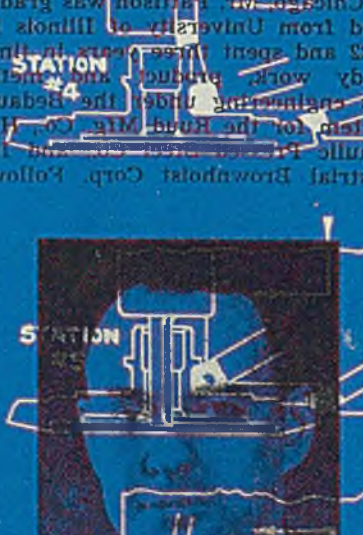
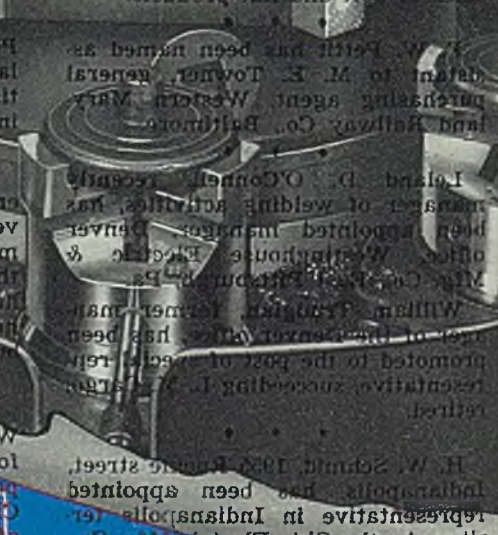
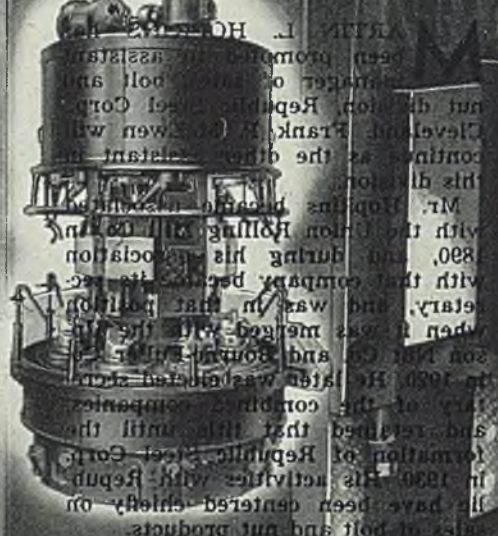
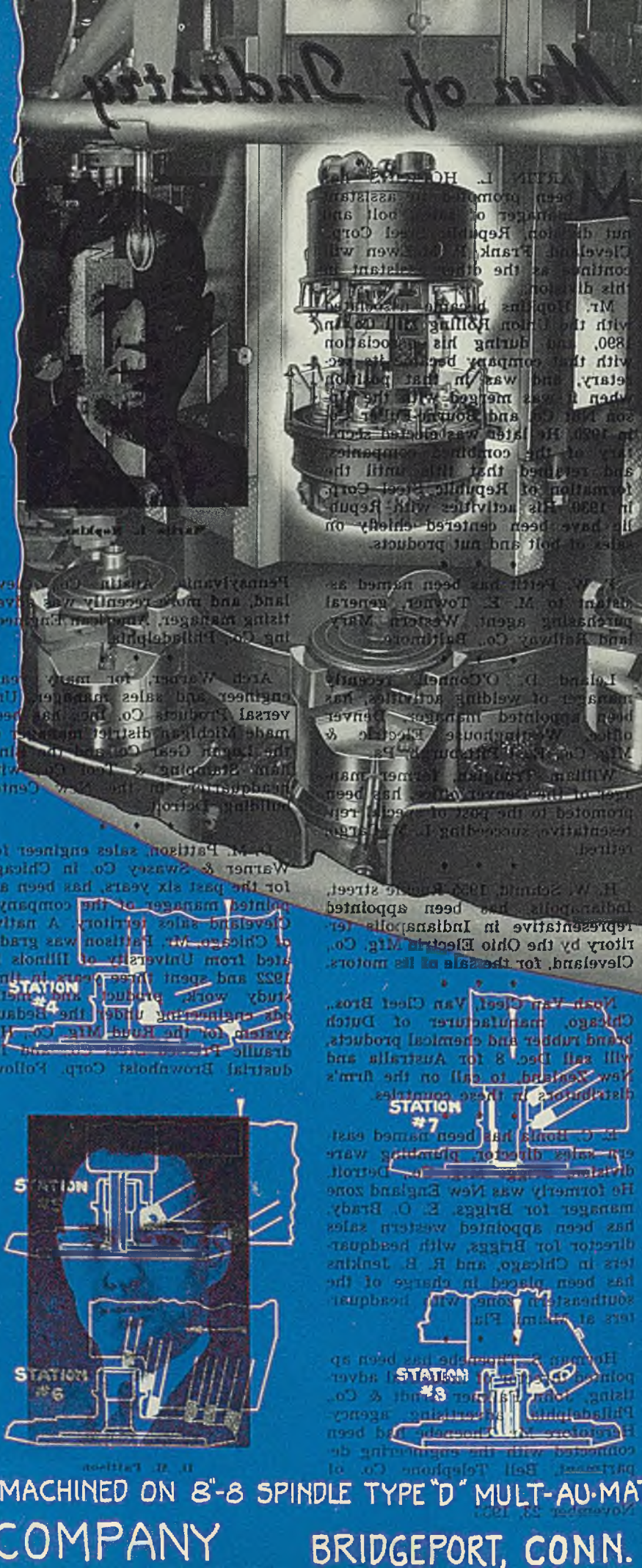
STATION #6



STATION #7



STATION #8



REAR AXLE DRIVING GEAR MACHINED ON 8"-8 SPINDLE TYPE "D" MULT-AU-MAT

THE BULLARD COMPANY BRIDGEPORT, CONN.

Motors of Tomorrow

MOTOR DOM

Automobile Production

Then there is some basis for believing that savings may be worked out by Nash-Kelvinator Corp. through joint purchases. Stockholders meet Dec. 23 to ratify the merger of the two concerns.

Now that the year is winding up, it is time to look back at the progress of the automobile industry. An examination of all of the 1937 models under one roof at one time would show how many 1936 features have been carried over. Changed or modified features were few. There were often work on outward appearance—trim, wheels, hubcaps, and so on. Doubtless, many of these changes would call this a superficial improvement of the industry and all times a problem that surpasses the industry's ability to solve.

In a nutshell, the industry's conservative place, something new in each model, and not becoming too radical. Models for 1937 were assigned with the 1936 departure from 1936 to arouse the desire to buy and you may be sure that when it comes time to build 1938 models, the same conservative policy may be followed. It is this year, says Harry Klinger, president of Pontiac Motor Co., boys out these conditions, when he said that like every other volume motor car maker, the organization was constantly worried for fear it might get ahead of the public's demand for a year.

Keep No Stop with Public
The motor people he said were more concerned that the public would not buy the models from year to year and that they would not appear in appearance. The motor car designers' leading problem was to keep exactly in step with the public's taste.

Consistent with this policy, the industry always has preferred to take a major engineering change by degrees, over the span of several years.

The most successful automobile designs are those which incorporate the greatest number of features desirable to the public. Public taste progresses just as rapidly as the automobile itself," states H. Murray Northrup, chief engineer of the Hudson Motor Co., showing how opinions coincide.

"Automobile engineering design progresses along many lines. Some of these are very obvious and easy to follow. Others are more various until the time they burst forth on the public in fully developed form."

Just to examine in 1934, we brought out a car in which the space was concealed within the lines of the body. For some time past we had felt that this was a tendency, but the public up to that time was not ready for the change. Since the introduction of the 1934 Hudsons with concealed tires, the industry generally has gone to that particular form of body. Now the rear compartment has been further developed, not only to include the tire, but liberal baggage space," Mr. Northrup says.

Passenger Cars and Trucks—U. S. Only
By Department of Commerce
The Department of Commerce has announced that the production of automobiles in the United States for the first nine months of 1937 was 1,100,000 units, a 10 per cent increase over the same period in 1936. The total production for the year is expected to reach 1,200,000 units.

Incidentally, the design of a person started with concealed tires appears to have depleted a small, yet lusty market for sheets. They say in Detroit that the metal tire cover makers have had a big swath cut out of their business.

Six Cars Designed

Little wonder that Chevrolet, just for an example, had six complete cars designed and on the boards last January when preparatory work on the 1937 model started. Furthermore, officials thought seriously enough of the L-head motor at one time to draw up and circulate plans for bidders on component parts.

But Chevrolet and General Motors executives decided it was more conservative to make a model appealing to the family and one with a few of the 1936 features carried over. The result is the car you have seen in the streets since Nov. 7.

General Motors has kept development work active for some years on a four-cylinder, L-head engine model. With a little prying you can see these and a few other novelties out at the Motor City, proving ground.

But, if a rear-engine model should be dropped into one of, say the Olds, Pontiac or Buick lines, the public probably would jam dealers' show rooms, but few would buy. Everyone would wait for the next man to try it out first.

So, as long as General Motors

is the first making this feature noticeable are the last word. The situation boils down to the truth that automotive engineering is so far ahead of what the public understands. What the Public understands is that the automobile is a machine for the road (that is, yearly) that the public will not understand the 1937 car. The public is not ready for the change. Since the introduction of the 1934 Hudsons with concealed tires, the industry generally has gone to that particular form of body. Now the rear compartment has been further developed, not only to include the tire, but liberal baggage space," Mr. Northrup says.

On one side these manufacturers are faced with the question of how to make a lucky stab with some innovation; on the other, a magnificence of culture. The public is not ready for the change. Since the introduction of the 1934 Hudsons with concealed tires, the industry generally has gone to that particular form of body. Now the rear compartment has been further developed, not only to include the tire, but liberal baggage space," Mr. Northrup says.

Very few years ago, three to four years ago, mechanical design, many have been the times when the Grahams, Reos, and Hupps and their like almost been swept away by the idea as a possible life-saver in the

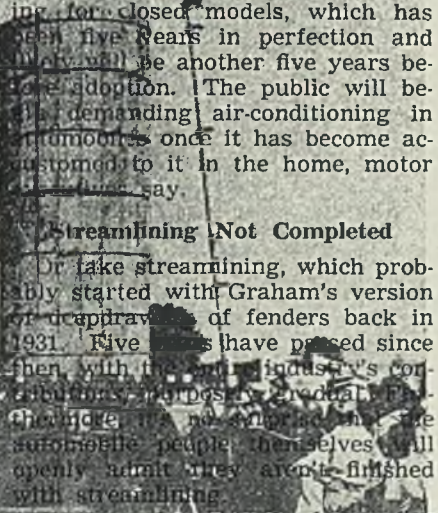
But, speaking of changes, the application only to mechanical revision isn't. Take air-conditioning for closed models, which has been five years in perfection and may well be another five years before adoption. The public will be demanding air-conditioning in automobiles once it has become accustomed to it in the home, motor

Streamlining Not Completed

Or take streamlining, which probably started with Graham's version of deapirating of fenders back in 1931. Five years have passed since then with the automobile industry's contribution of modestly creditable. The public is not ready for the change. Since the introduction of the 1934 Hudsons with concealed tires, the industry generally has gone to that particular form of body. Now the rear compartment has been further developed, not only to include the tire, but liberal baggage space," Mr. Northrup says.

Just to consider a few other "freaks" in the sense that four-wheel brakes and self-starters also fell in that description once, there's the three-wheel car, independent springing on all four wheels and complete detachability of all riders' seats to add to the subject of rear-engine mounting.

Consider wider and deeper bodies—no one believes that 1937's mod-



Mirrors of Motordom

els, the first making this feature noticeable, are the last word.

The situation boils down to the truth that automotive engineering is so far ahead of what the public wants that it requires constant restraint for the motor maker to manufacture only what the driver and rider will buy.

Speaking of air-conditioning for automobiles, some circles in Detroit think this may have been a contributing factor to the move Nash made by acquiring Kelvinator.

A short time ago, Kelvinator announced a small, inexpensive, compact air-conditioning application for residences, which when the time is ripe, would be a major step completed toward installation in coupes and sedans.

Nash appears to fortify itself from another angle, that concerning labor difficulties. Kenosha, Wis., and Milwaukee have had their strike outbreaks at many times in the last three to four years. Very likely, the Kelvinator plant could be used for certain light automobile stampings.

A number, but not a majority, of

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	452,955
July	264,933	332,109	440,999
Aug.	234,811	237,400	271,291
Sept.	170,007	87,540	135,130
Oct.	131,991	272,043	*225,200
10 mo....	2,516,005	3,147,347	3,561,496
Nov.	83,482	395,059	.....
Dec.	153,624	404,528	.....
Year	2,753,111	3,946,934	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Oct. 31	66,985
Nov. 7	84,305
Nov. 14	104,248
Nov. 21	110,160

Kelvinator's 10,300 retail outlets could hook up with Nash salesrooms.

Then there is some basis for believing that savings may be worked out by Nash-Kelvinator Corp. through joint purchases. Stockholders meet Dec. 23 to ratify the merger of the two concerns.

Week after next, on Dec. 7 to be exact, the thrice-delayed Hupp Motor Co. stockholders' meeting is scheduled, but if performance on this score means anything, Detroit will believe it only when the event comes to pass.

In a few weeks now it will be a year since Hupp stopped making passenger cars and started searching for working capital. During that tempestuous year there have been three presidents (one, Wallace Zweiner, removed by death), plus numerous court tangles with the former Archie Andrews management. The Hupp "sales" item that appeared on quarterly reports this year has meant little more than parts sales.

In spite of, and yet possibly due to its abject position, Detroit is talking considerably of Hupp these days and its eventual outcome, chiefly for the reason that through so many years its position and name were enviable in motordom.

There are many well-wishers who would like to see Hupp come back, as it said it might for 1937, when it revealed recently it had complete designs for a new model. But even the most sanguine fear that even with the money obtained most of the dealer outlets have been lost.

Much repairing would be necessary in a plant idle for a year. Three to four months would be required for new tools and dies.

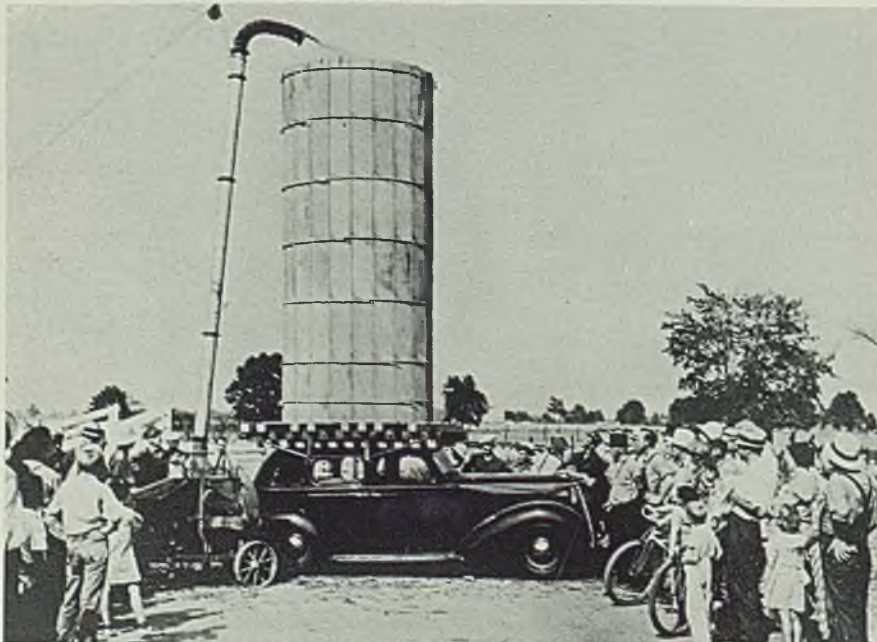
There are still only a few re-trenchment moves left, such as sale of some of the Detroit plants, in the way three Cleveland plants were sold a few months ago.

In that connection, one of the leading motormakers in Detroit is said to be trying to buy some of Hupp's plant space outright. Part of it already is under lease to Good-year.

In assemblies last week, the gap between Ford and Chevrolet narrowed. Ford, on a six-day week, made better than 25,000 models, while Chevrolet on a five-day week accounted for 28,000 during the week.

At this writing, Chevrolet has the field better stocked than Ford and for that reason the Ford rate may make further gains.

Giving All-Steel Body the Concrete Silo Test



DUSHING a car over a cliff to demonstrate the strength of an all-steel body is obsolete. New tests are being devised, of some interest to manufacturers whose steel is shown to endure so much. Studebaker drove a stock sedan to a farm district; built a 5-ton concrete silo on its all-steel top. Then, with an appreciative audience standing by, filled the silo with 300 pounds of ensilage.

Car doors still opened easily, closed securely

Free with every order

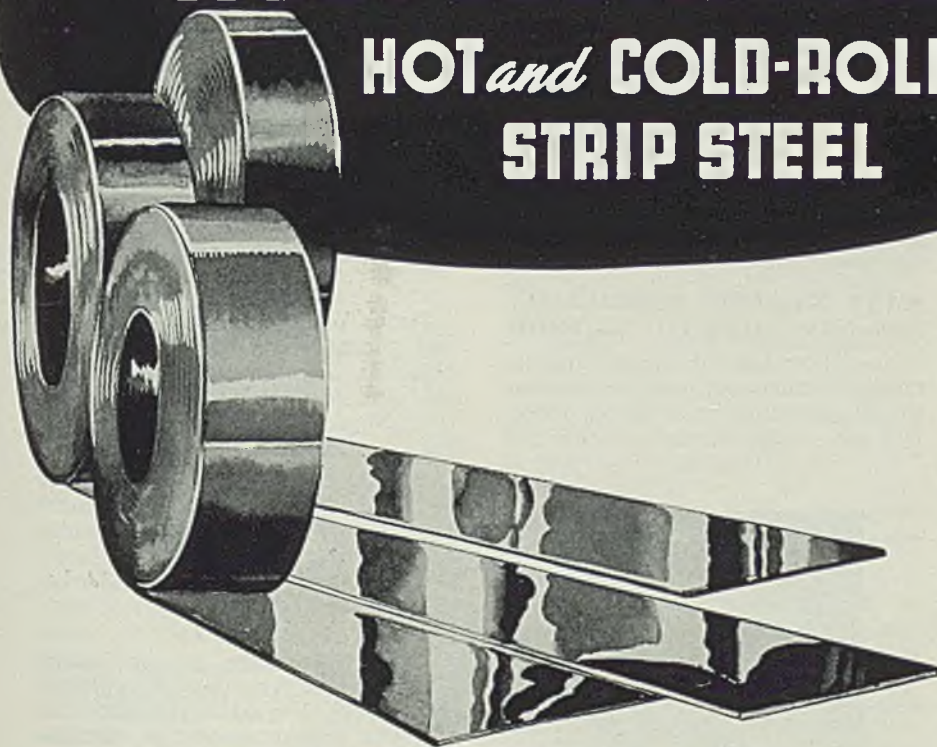
40 years of "know how"



You can't see it . . . you can't feel it
 . . . you can't weigh or measure it in
 physical terms . . . it's intangible, but
 you know it is there!

WEST LEECHBURG

HOT *and* COLD-ROLLED STRIP STEEL



In 1897, north of Pittsburgh in a little town on the Kiskiminetas River, West Leechburg began the manufacture of strip steel. Only strip, and only the best strip.

For forty years, West Leechburg's mills have rolled steel hot and cold into countless miles of gleaming ribbon, each foot produced with ever-increasing knowledge and skill.

Today, West Leechburg is an accomplished specialist—headquarters for strip in any steel—including all grades of Allegheny Stainless. Delivery and attention to detail are of headquarters quality—absolutely dependable.

ALLEGHENY STEEL COMPANY . . . BRACKENRIDGE, PA.
WEST LEECHBURG DIVISION

Sales Offices and Warehouse Stocks in the Principal Cities
 Warehouse Stocks carried by JOS. T. RYERSON & SON, INC., WAREHOUSES . . . Union Hardware & Metal Company, Los Angeles . . . American Brass & Copper Company, San Francisco—Oakland
 ALLEGHENY PRODUCTS: SHEETS FOR AUTOMOBILE BODIES, METALLIC FURNITURE, DEEP DRAWING, ALLEGHENY METAL, ALLEGHENY STAINLESS STEELS, ELECTRICAL SHEETS, HOT & COLD ROLLED STRIPS, STEEL CASTINGS, SEAMLESS TUBING, BOILER TUBES, PIPE.
 (Allegheny Metal is licensed under Chemical Foundation Patents Nos. 1,316,817 and 1,339,378)

WEST LEECHBURG . . . HEADQUARTERS FOR STRIP STEEL,
including all grades of ALLEGHENY STAINLESS

Men of Industry

(Concluded)

H. ... Cincinnati; ... Edward ... & Son, Columbus, O.

Jack R. Fersheimer, St. Louis, has been elected president of the St. Louis chapter of the Institute. Harry Keiner, Hickman Williams & Co., has been made first vice president; C. ... I. J. Cohen & Son ... Steel & Rail Co., St. Louis, third vice president, and Fred S. Fuld, Harry Benjamin Equipment Co., secretary-treasurer. D. H. Cohen, ... St. Louis, retiring ... has been named chairman of the ...

F. L. Walton, ... Champion Machine & ... Cleveland, has been appointed director of sales, Cape Ann Tool ... Pigeon Cove, Mass.

Meetings

METAL TREATING ... INC. in Cleveland ... ed the following ... dent, A. D. Bach, ... allurgical Corp., ... Mass.; vice president, ... Pittsburgh Commercial Heating Co., Pittsburgh; treasurer, ... Muehlemeyer Co., Rockford, Ill.; and secretary, Kenneth Stumpf, Stanley B. ...

New directors were named as follows: B. G. Saul, Porter Forge & ... Derhammer, Lakeside, ... man, Commonwealth Industries, Detroit, ... Thulmer, ... Milwaukee.

The institute approved a national ... including ...

Among keynote speakers who will define the attitude of business toward current economic and social problems at the ... can Industry to be held at the Waldorf-Astoria, New York, Dec. 9-10, in conjunction with the convention of the National Association of Manufacturers will be E. ... man, National Steel ... burgh, and Lewis H. ... dent, Johns-Manville ... York.



President ... Kuehn ... Steel Co., Milwaukee, ... of Inland ... has been ... a director of Inland ... STEEL, Nov ...

Other speakers will include ... Hook, president ... Co., Middle ... and ... and ... of Industrial ...

Research, Pitts ... Proceeding the Cong ... can Industry ... the ...

... the ... will ...

MANY EXHIBITS SCHEDULED FOR NEW YORK POWER SHOW

A wide range of power and industrial machinery and accessories, a considerable portion in operation, will be shown at the twelfth Na-



... J. ...

tional Exposition of Power and Mechanical Engineering in Grand Central Palace, New York, Nov. 22-25. Three floors will be devoted to exhibits which will include ... materials handling and power plant equipment, control instruments, valves and fittings, heat and sound insulation, electrical equipment, flexible couplings, indicators and lubricants, paint spraying apparatus, and drain room accessories.

CHARLES A. PATTERSON, 62, for ... and late president of the Standard ... Co., Cleveland, in that city, ... served with the Atlantic Foundry Co. and was vice president of the former Fulton Foundry Co.

... 67, president ... Works, ...

... 62, president and ... in New ...

... 35, ...

... 33, ...

James W. ... and general manager ... mill and machinery ... city, Nov.

Thomas S. ... shop experience ... city ...

F. ... 65, prominent inventor and ventilating engineer, New York, in Washington, recently. He was president of the General Fan Corp., New York, and for many years was president of the Typhoon Fan Co., also of that city.

Charles Allen Maydwell, 83, well known in the steel and hardware ... Pacific coast, in Oak ... Nov. 10. He formed the ... Co., San Francisco, in ... represented a number of eastern manufacturers. In 1923 he

WEST LEBCHURGE STEEL COMPANY HEADQUARTERS FOR STRIP STEEL ... including all grades of ALLEGHENY STAINLESS

tactics and provide adequate punishment for violations."

These two representatives also asked that provision be made to provide expenses for workers who are a party to litigation against employer coercion or discrimination. The letter continued:

"We also request a law with teeth, absolutely forbidding the financing of company unions by the management, in any way, and providing that all meetings by employe representatives be held outside the plants and be free from all interference from the managements, and that the men of each plant be permitted to choose whatever collective bargaining agency they wish without fear or favor."

Maloy and Patterson expressed their "heartfelt gratitude" to President Roosevelt for his statement at a recent press conference in which he said that the cost of living should not be a determining factor in wage rates if it acted to curb the improvement of wages. They said also that they were grateful for "the splendid manner in which you clarified your stand on living cost index base, such base being the essence of a so-called agreement on wages being offered by the United States Steel Corp."

LABOR'S "FRONT SEAT" SEEMS LESS SECURE THAN FORMERLY

The past week at Washington has put labor in the headlines to a considerable extent. Apparently labor leaders like to hold the front page and will continue to do it if activities and highly paid press agents have anything to do with it.

There has been a change in the feeling here within the past couple of weeks as to the attitude in which the administration is going to deal with the labor situation.

John L. Lewis and Major George L. Berry have been prominent in statements on the political and labor situation in an effort to force the attention of the Chief Executive. However, labor now knows that the President will not turn to it and ask what it wants. That is one of the reasons labor leaders have been crying so loudly. If the President cares to he can get out from under the labor situation and the labor leaders have been advised on this matter by some of their smart newspaper friends.

PATMAN LAW COMPLAINTS SEEM HEADED FOR FALL

Apropos of the continued interest in the administration of the Robinson-Patman law by the federal trade commission, there is some backstair gossip at the commission.

Attention was called last week to the fact that three out of the four answers received to the first four formal complaints under this law

attacked the constitutionality of the act.

It now develops, according to gossip at the commission, that members and other officials there feel that these first four complaints were poorly and loosely drawn and that they gave the respondent companies a wide door to attack the constitutionality feature.

In view of the fact that the complaints were issued and answers already received there is doubt on the part of some commission officials that anything can be done about it, although the commission does sometimes amend complaints. Should these three cases go into the courts for final adjudication certain observers believe the commission is going to lose, which might probably lead to amendments to the act.

CENSUS OF UNEMPLOYED IS SUGGESTED IN TWO PLANS

There is renewed talk here of the possibility of an unemployment census by the bureau of the census of the commerce department. This was taken up some time ago by the secretary of commerce but at that time he tried to pry \$15,000,000 loose from PWA funds for the census and Secretary Ickes refused to consent.

Talk of such a census began as far back as 1934 and while funds were refused then it is reported now that the President would like to see such a census and that congress may be asked for a specific appropriation for this purpose at the coming session.

The idea would be, it has been stated by Mr. Roper, that after the census has once been taken it will be kept up to date periodically, thus bringing into being another census. It is estimated that some 25,000 persons would be needed to take such a census and Mr. Roper has refused to say that it would necessarily mean that the employes should be under civil service.

It is unofficially estimated now at the department of commerce that there are some 9,000,000 unemployed. One of the questions being worked out by a special committee appointed by Secretary Roper is to find a suitable definition for "unemployment." Included on this committee are also representatives of the labor department.

It would be necessary to carry this out, said Secretary Roper, to train these 25,000 persons for a period of three or four months to familiarize them with the questionnaires to be filled out. It is estimated that the field work for such a census would take about six months.

As opposed to this idea of a census is one that is now being suggested by the President calling for

a self-registration census of the unemployed such as is now carried out in England. Under the plan, if it should be carried out, once a month the unemployed would register themselves and the President believes that such a census could be taken for about 10 per cent of the cost of the census suggested by Secretary Roper. In order to receive any relief the worker would have to register as being unemployed. This would save the ringing of doorbells all the time to take the census if it were to be kept up to date. The President evidently feels that something along this line should be undertaken.

TRADE AGREEMENTS HELD GREAT AID TO COMMERCE

Speaking last week at the national foreign trade convention, Assistant Secretary of Commerce E. G. Draper took up the question of the effects of trade agreements.

In the case of those countries with which we now have agreements he stated that "the record of our export and import trade with these countries shows an increase of nearly \$190,000,000 for the first six months of 1936 compared with the first six months of 1934, before the trade agreement program became active.

"This represented a gain of business activity of 42 per cent. On the other hand, our foreign trade with all other countries during this same period grew by \$230,000,000, a somewhat larger amount, but for the trade involved, it represents an increase in activity of only 16 per cent."

Mr. Draper contended that "in every case, concessions granted or received have little effect on domestic production, as concessions on highly competitive products have been avoided."

"We are well on our way to restoring our foreign markets and are stimulating a healthy amount of imports from foreign countries in the interest of American consumers as well as in the interest of world prosperity," continued the secretary.

"It is true that import quotas, exchange controls and high duties are still prevalent throughout the world, but further increases in these trade restrictions are already in bad odor, and foreign nations are showing an increasing interest in efforts to remove excessive trade barriers. The example of the United States has been enlightening. We have every reason to believe that the trade agreement program of the United States is but the first of a series of steps which will be made by all the major industrial nations of the world in a determined effort to reopen the channels of international trade."

Don't Let Extreme Opinions Distort Your Perspective

IN THEIR efforts to appraise the significance of the election result of Nov. 3, a number of commentators are making rather sweeping statements. If one were to believe some of the opinions expressed in print, over the radio and in informal luncheon conversation, a new era has come upon us overnight and forthwith we are to be plunged into a radically changed state of national existence.

Undoubtedly time will help to tone down these extreme views. In an economic system as complex as ours, violent changes cannot be effected suddenly, no matter how marked or positive is the public demand for them. Even though we accept at face value the interpretation by certain authorities that the election was a "revolt of laboring men and white collar workers" against the disproportionate exercise of power over their lives by "bankers, lawyers, employers and the heavily propertied classes," we must realize that the outcome will be reflected in a more or less lengthy series of graduated changes rather than in one sudden overturn of present practices.

Responsibility of Transforming Theories into Workable Plans Will Make Idealists Conservative

The most effective brake against hasty or ill-advised tinkering with our delicately balanced economic machinery will be the sobering influence of responsibility. Thus far those who have led the alleged "revolt" have been dealing with theories. Now they are faced with the difficult task of transforming ideals into workable specifications. This job entails responsibilities, which, in the light of history throughout the world, always breed caution and conservatism.

In the days immediately ahead, the question will arise as to whether the idealists shall be trusted with the full responsibility of putting their theories into practice, or whether they shall be aided by persons who have had years of experience in dealing with problems that involve industry and finance on one hand and social progress on the other.

Industrial executives, in common with bankers and others in the discredited classes, may accept either of two alternatives in dealing with this question. They can assume a belligerent attitude, defying the will of the majority of voters and obstructing at every

turn the efforts of their duly elected public officials. Or, while still clinging to principles they believe to be right, they can adopt a co-operative policy and thereby win an opportunity to help draft the changes in our system.

The editors of this publication are inclined to favor the second alternative—at least for the present. Judging from what has happened since Nov. 3, many progressive leaders of industry also favor the co-operative policy.

Unfortunately, however, a minority in industry seems to disagree on this point. The editors of STEEL have been criticized for what one writer diagnoses as "taking a licking lying down." It has been charged that the attitude expressed editorially in the two issues since Nov. 3 does not jibe with our views presented prior to that date. Likewise there is a minority criticism of the overtures which some industrial executives have made to government officials.

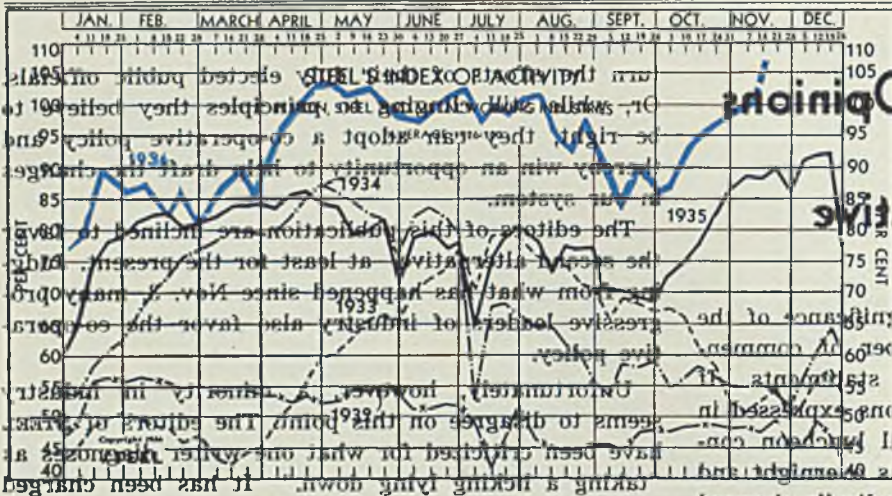
Isn't It Better To Help Guide Changes in Our System Than To Give Others Free Rein?

Possibly these critics do not look at the situation as we do. We are strongly in favor of social progress and real social security. We believe these desirable attainments are subject to the limiting factors of our economic system. We think that in the long run enlightened industrial leadership can guarantee more substantial and more orderly social progress than that envisioned by politicians of either party. We criticized the new dealers because we think they are promising social advances which cannot be fulfilled as quickly as they intimate. We think they are making a mistake in deriding thrift and independence and making a virtue out of shiftlessness and incompetence. We shall continue to criticize policies which we believe to be unsound.

However, on Nov. 3 the American public—rightly or wrongly—returned the advocates of the new deal to office. Apparently the majority has more faith in the new deal program than in industry's program. We think the public has been misled by extravagant promises, but under our laws its judgment is final.

To us, the duty of industry is clearly defined. It is to accept the verdict of Nov. 3 gracefully, and to try to help the victors to work out their difficult problems sensibly and practicably. If the winners go high hat, or become unreasonable, then a different course of action may become necessary. But unless the initial overtures of assistance are frowned upon definitely, industry's cue is to be a good sport, which role the majority of its executives now is playing to perfection.

THE BUSINESS TREND



STEEL'S index of activity in the iron, steel and metalworking industries gained 1.0 points to 108.1 in the week ending November 12.

Week ending	1936	1935	1934	1933
Aug. 15	92.6	77.5	61.4	74.2
Aug. 22	97.7	77.9	60.3	70.6
Sept. 5	87.5	70.9	53.5	65.5
Sept. 12	83.1	70.1	58.7	69.1
Sept. 19	90.1	69.4	58.1	68.2
Sept. 26	86.2	68.5	59.3	66.9
Oct. 3	89.8	70.1	57.4	67.4
Oct. 10	93.4	74.9	56.4	64.0
Oct. 17	95.5	77.4	58.2	69.0
Oct. 24	98.8	86.4	55.0	58.0
Oct. 31	99.1	86.4	55.0	52.3
Nov. 7	108.1	88.8	55.2	52.6

It has been charged that a lack of leadership in the industry has been the cause of its present predicament. The editors of this publication are inclined to believe that the industry has been hit by a severe depression since Nov. 1, 1930. The editors of this publication are inclined to believe that the industry has been hit by a severe depression since Nov. 1, 1930. The editors of this publication are inclined to believe that the industry has been hit by a severe depression since Nov. 1, 1930.

Activity Index Mounts to Highest Point Since 1929

It is better to help guide changes in our system than to let it be changed by others. The activity index of the iron, steel and metalworking industries has reached its highest point since 1929, according to a report issued by the American Iron and Steel Institute. The index, which is a composite of the production of pig iron, steel, and metalworking products, stood at 108.1 in the week ending November 12, 1936. This is a gain of 1.0 point from the previous week. The index has been on a steady upward trend since the beginning of the year, and is now at its highest point since 1929. The American Iron and Steel Institute, which is a non-profit organization, has been monitoring the industry's activity since 1929. The institute's report is based on data supplied by the industry and is considered a reliable indicator of the industry's health.

Year	Aug. 15	Aug. 22	Sept. 5	Sept. 12	Sept. 19	Sept. 26	Oct. 3	Oct. 10	Oct. 17	Oct. 24	Oct. 31	Nov. 7	Nov. 14
1936	736.497	734.973	764.680	774.771	786.786	792.792	800.800	808.808	816.816	824.824	832.832	840.840	848.848
1935	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1934	614.005	625.774	637.543	649.312	661.081	672.850	684.619	696.388	708.157	719.926	731.695	743.464	755.233
1933	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1932	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1931	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1930	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1929	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336

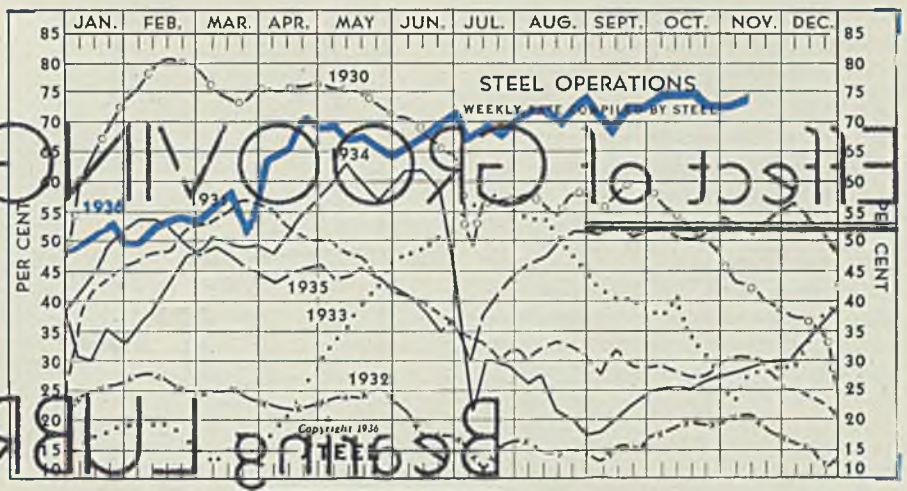
Unquestionably time will help to tone down these extreme views. In an economic system as complex as ours, violent changes cannot be effected suddenly, which had dropped off moderately in the first half of the year. The index has rebounded to within striking distance of the 800,000 car mark. Steelworks operations again assumed a stronger level of activity in the week ending Nov. 14, the rate of production was estimated at 74 per cent of capacity compared with 73 in each of the three preceding weeks. The likelihood of imminent action on finished steel prices, with the prospect of moderate increases, will serve to stimulate demand over the remainder of the year.

An indication of renewed activity in the capital goods industries is found in the October report of machine tool orders. According to the National Machine Tool Builders' association, the index for October stands at 136.5, a rebound from 118.5 in September. The index for October is a gain of 18 points from the previous month. The index has been on a steady upward trend since the beginning of the year, and is now at its highest point since 1929. The National Machine Tool Builders' association, which is a non-profit organization, has been monitoring the industry's activity since 1929. The association's report is based on data supplied by the industry and is considered a reliable indicator of the industry's health.

Year	Aug. 15	Aug. 22	Sept. 5	Sept. 12	Sept. 19	Sept. 26	Oct. 3	Oct. 10	Oct. 17	Oct. 24	Oct. 31	Nov. 7	Nov. 14
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1934	614.005	625.774	637.543	649.312	661.081	672.850	684.619	696.388	708.157	719.926	731.695	743.464	755.233
1933	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1932	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1931	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1930	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336
1929	601.788	606.917	612.046	617.175	622.304	627.433	632.562	637.691	642.820	647.949	653.078	658.207	663.336

Steelworks Operations Up 1 Point to 74 Per Cent

	1936	1935	1934
Nov. 14	74.0	52.0	28.0
Nov. 7	73.0	51.0	27.5
Oct. 31	73.0	54.5	27.0
Oct. 24	73.0	52.5	25.5
Oct. 17	75.0	51.0	26.5
Oct. 10	75.0	52.0	25.0
Oct. 3	74.5	53.5	25.0
Sept. 26	73.0	51.0	25.0
Sept. 19	72.5	52.0	22.5
Sept. 12	69.5	54.0	20.5
Sept. 5	71.5	52.0	18.0
Aug. 29	73.0	52.5	18.5
Aug. 22	72.0	52.5	20.5
Aug. 15	70.5	51.0	21.5



Class 1 Railroads Earn 2.30 Per Cent in Nine Months

	1936	1935	1934
Jan.	\$35,764,748	\$21,348,557	\$31,058,275
Feb.	33,594,718	25,719,919	29,420,772
March	35,205,513	37,850,965	52,217,083
April	41,547,644	45,625,786	32,433,939
May	41,842,147	39,505,069	39,699,194
June	50,312,580	34,102,703	42,037,757
July	61,773,765	26,919,343	35,441,265
Aug.	64,680,717	42,156,706	40,564,071
Sept.	70,166,026	57,359,339	41,713,425

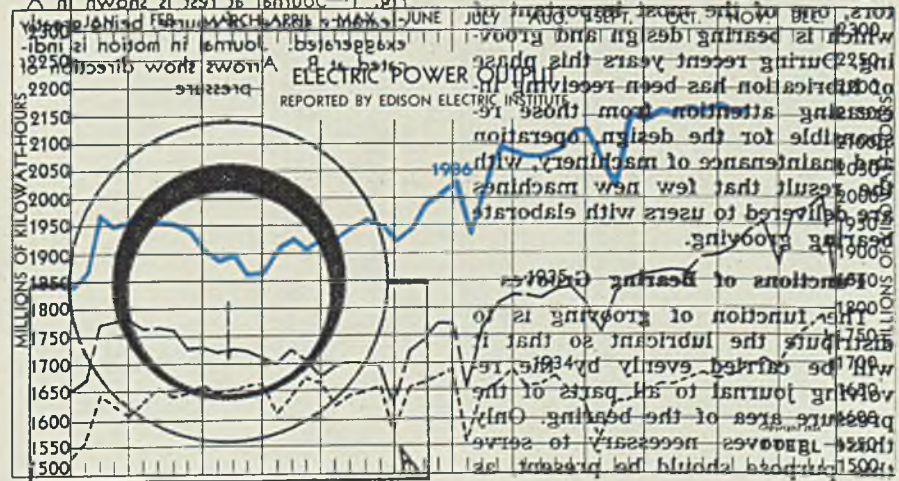
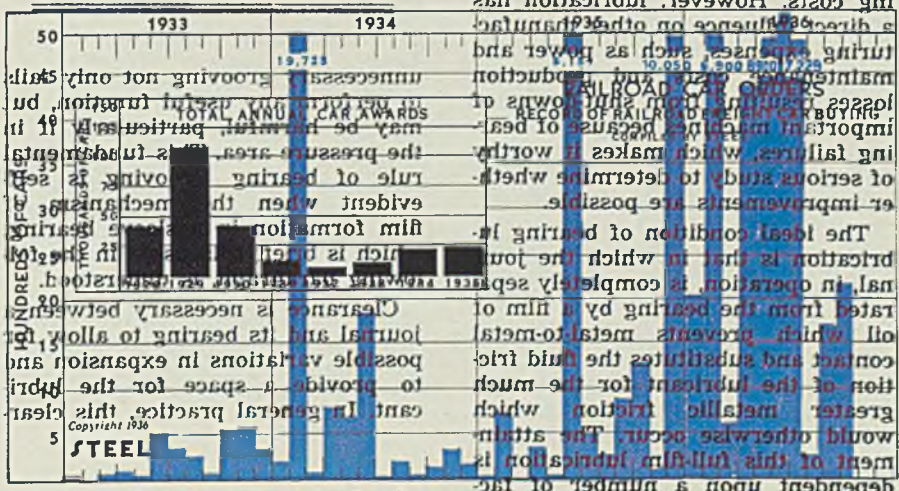
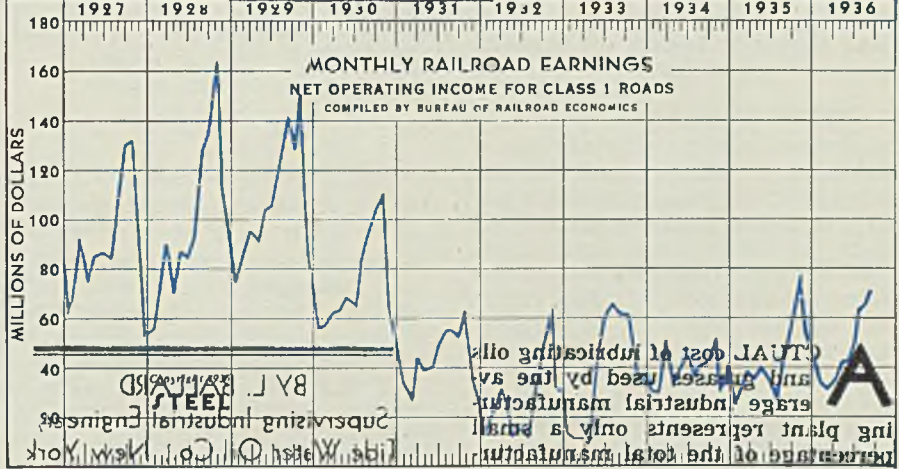
Approximately 75,425,000 tons of iron ore were used in the production of pig iron in the nine months ending September 30, 1936, compared with 54,234,305 tons in the same period in 1935 and 49,336,307 tons in 1934.

Because of the weight of the journal and the load that it supports, its center does not coincide with the center of the bearing with the result that the clearance space is in the lower part of the bearing.

October Freight Car Awards Continue Upward

The freight car industry is showing a steady upward trend in production and awards. The total annual car awards for October 1936 are expected to reach a new high, reflecting the continued demand for freight cars in the transportation sector. The industry is also seeing improvements in efficiency and quality, which are contributing to the overall growth of the sector.

	1936	1935	1934	1933
Nov. 14	2169	1938	1691	1617
Nov. 7	2169	1938	1691	1617
Oct. 31	2175	1895	1667	1583
Oct. 24	2166	1895	1677	1621
Oct. 17	2170	1863	1667	1618
Oct. 10	2168	1867	1658	1656
Oct. 3	2169	1843	1659	1616
Sept. 26	2157	1857	1648	1612
Sept. 19	2177	1851	1630	1638
Sept. 12	2078	1827	1633	1633
Sept. 5	2068	1758	1564	1512
Aug. 29	2125	1839	1648	1630
Aug. 22	2125	1839	1648	1630
Aug. 15	2094	1832	1674	1630



Effect of GROOVING on

Bearing LUBRICATION

ACTUAL cost of lubricating oils and greases used by the average industrial manufacturing plant represents only a small percentage of the total manufacturing costs. However, lubrication has a direct influence on other manufacturing expenses, such as power and maintenance costs and production losses resulting from shut-downs of important machines because of bearing failures, which makes it worthy of serious study to determine whether improvements are possible.

The ideal condition of bearing lubrication is that in which the journal, in operation, is completely separated from the bearing by a film of oil which prevents metal-to-metal contact and substitutes the fluid friction of the lubricant for the much greater metallic friction which would otherwise occur. The attainment of this full-film lubrication is dependent upon a number of factors, one of the most important of which is bearing design and grooving. During recent years this phase of lubrication has been receiving increasing attention from those responsible for the design, operation and maintenance of machinery, with the result that few new machines are delivered to users with elaborate bearing grooving.

Functions of Bearing Grooves

The function of grooving is to distribute the lubricant so that it will be carried evenly by the revolving journal to all parts of the pressure area of the bearing. Only those grooves necessary to serve this purpose should be present, as

BY L. BALLARD
Supervising Industrial Engineer,
Tide Water Oil Co., New York

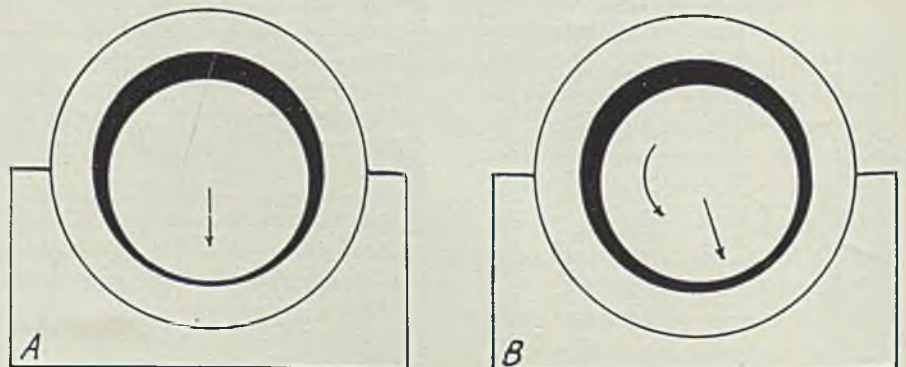
unnecessary grooving not only fails to perform any useful function, but may be harmful, particularly if in the pressure area. This fundamental rule of bearing grooving is self-evident when the mechanism of film formation in a sleeve bearing, which is briefly discussed in the following paragraph, is understood.

Clearance is necessary between a journal and its bearing to allow for possible variations in expansion and to provide a space for the lubricant. In general practice, this clear-

ance amounts to approximately 0.001-inch per inch of journal diameter plus an additional 0.001-inch. Because of the weight of the journal and the load that it supports, its center does not coincide with the center of the bearing with the result that the clearance space is in the form of a crescent with its wedge shaped ends on either side of the pressure area.

Fig. 1-A shows a journal at rest with the clearance space exaggerated for the purpose of illustration. The direction of pressure is downward and most of the lubricant has been squeezed out from the pressure area. When rotation starts with the clearance space full of oil, part of the oil, as a result of its adhesiveness, is dragged with the journal between the frictional surfaces. As the speed increases more oil is carried with the revolving journal and because of the wedge-like shape of the clearance space ahead of the pressure area, sufficient hydraulic pressure is soon built up to separate the

Fig. 1—Journal at rest is shown in A, clearance space, of course, being greatly exaggerated. Journal in motion is indicated at B. Arrows show direction of pressure



journal completely from the bearing with a film of oil. This film is hydrodynamic in action and actually forces the journal to one side so that the line of pressure is not directly downward, as when the journal is at rest, but at an angle to the direction of gravity, as shown in Fig. 1-B.

Ability of the oil film to lift and support a heavy load is dependent upon the fact that it is under hydraulic pressure as a result of the pumping action of the journal in the bearing. Obviously, any grooves in the pressure area which permit oil to escape from where it is needed will tend to destroy the lubricating film and may cause metallic contact with a resultant greater wear and power loss. A type of faulty grooving in the pressure area, which was common in the past, is the familiar "figure 8" shown in Fig. 3, which was thought necessary to provide proper distribution of the lubricant. However, the presence of

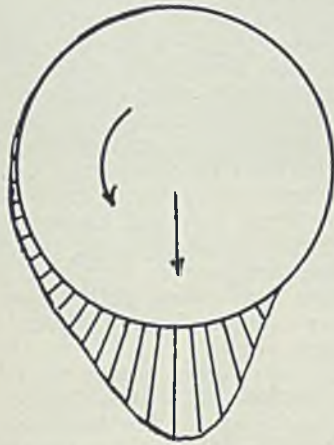


Fig. 2—Sketch showing magnitude of forces exerted by journal in motion

such grooves in the pressure area interrupts the oil film and weakens its load supporting ability.

Grooving Oil Lubricated Bearings

As previously stated, the fundamental principle of bearing grooving is to cut grooves only where necessary to distribute the lubricant lengthwise along the journal and never in the area of maximum pressure. The correct method of grooving a two-part cylindrical bearing with one point of oil application at the top is shown in Fig. 4. A groove should be cut in the top half extending lengthwise from either side of the point of application to a distance of approximately one-half inch from each end. Grooves should not be extended to the ends because they would then serve as means of escape, rather than of distribution, for the lubricant. All sharp edges should be re-

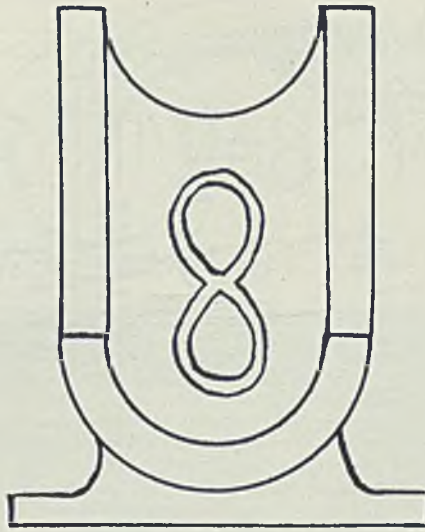


Fig. 3—Example of faulty grooving in the pressure area of a bearing

moved and corners rounded to prevent any tendency to scrape the oil from the revolving journal.

For bearings composed of two or more parts, it is important that the edges of the bearing segments be relieved or chamfered so that no sharp corners remain, as illustrated in Figs. 4 and 5. Not only does this serve to prevent the oil from being scraped off the journal, but it also provides an auxiliary reservoir aiding in distributing the lubricant longitudinally along the journal. Chamfering the edges of bearing segments and a longitudinal distributing groove at the point of application are usually all the grooving necessary or desirable in a cylindrical oil lubricated bearing with the point or points of oil application at the top and the direction of load downward.

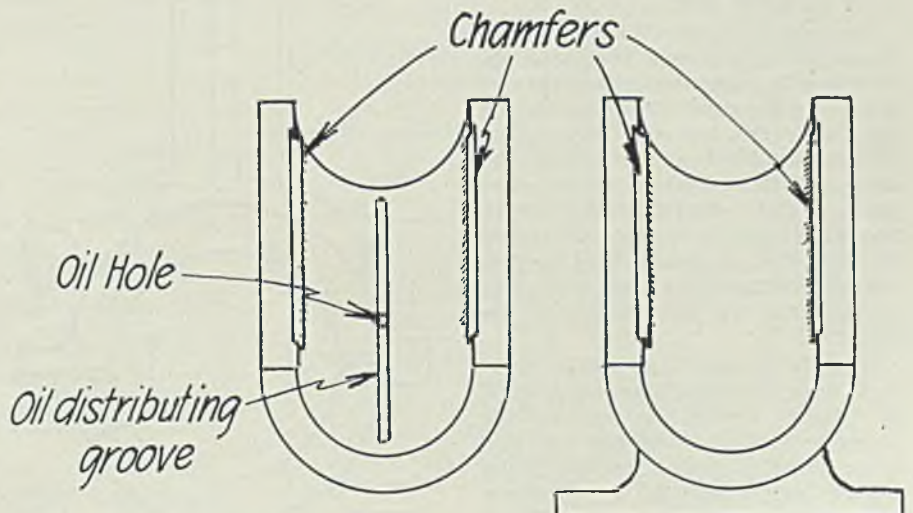
When the direction of load is upward against the top half of the bearing, the principles of grooving and chamfering are the same as for downward loads. However, the

point of oil application should not be at the top where the pressure is greatest, but at some point ahead of the pressure area to permit the formation of a load-supporting film. This is most important as it is not uncommon to find bearings with an upward load having the point of oil application and a distributing groove at the top, with the result that an effective load-supporting film cannot be formed. For medium or high-speed bearings of this type the point of application can be located in the bottom half on the side approaching the pressure area, as shown in Fig. 6. However, for relatively slow speed bearings or bearings subjected to heavy loads, more effective distribution is obtained by locating the groove in the upper half ahead of the area of maximum pressure, as illustrated in Fig. 7.

Lubricating Crankpin Bearing

Another type of cylindrical bearing commonly used in metal forming machinery, such as presses, is the crankpin bearing in which both the journal and the bearing have relative motion with respect to each other, and the area of maximum pressure is not stationary. In the case of vertical metal forming presses the crank drives the connecting rod and the pressure is downward on the working stroke and upward on the lifting stroke. As the direction of the load varies with the position of the crank, and the pressure is greatest at the bottom and top with the maximum at the bottom on the working stroke, the lubricant should be introduced on the side ahead of the bottom area of maximum pressure, as shown in Fig. 8. With the exception of chamfers on the bearing segments, in the case of a split bearing, no other grooving is necessary other than a longitudinal distributing groove at

Fig. 4—Correct method of grooving a two-part cylindrical bearing with one point of oil application in the top half



point of application should be at the top where the pressure is greatest and at some point ahead of the pressure area to permit the formation of a load-supporting film. This is most important as it is not uncommon to find bearings with upward load having the point of application and a distributing groove at the top with the result that an effective load-supporting film cannot be formed. For medium or high-speed bearings of this type the point of application can be located on the bottom half on the side approaching the pressure area, as shown in Fig. 8. However, for relatively slow speed bearings of this type, the point of application should be located on the top half on the side approaching the pressure area, as shown in Fig. 9. For installations where the bearing is subjected to heavy loads, more effective distribution is obtained by locating the groove in the upper half ahead of the maximum pressure area.

When the direction of load is upward against the top half of the bearing, it is necessary to provide a distributing groove in the upper half ahead of the maximum pressure area. This groove should be chamfered or rounded off to prevent the formation of a sharp edge which would cause a groove in the journal. The chamfering should be in the direction of rotation of the journal. The chamfering should be in the direction of rotation of the journal. The chamfering should be in the direction of rotation of the journal.

When the direction of load is upward against the top half of the bearing, it is necessary to provide a distributing groove in the upper half ahead of the maximum pressure area. This groove should be chamfered or rounded off to prevent the formation of a sharp edge which would cause a groove in the journal. The chamfering should be in the direction of rotation of the journal. The chamfering should be in the direction of rotation of the journal.

Horizontal lightly loaded bearings with grease cup or high-pressure fittings at the top require only a longitudinal distributing groove at the top and chamfering of the segment edges where the bearing is composed of two or more parts. The distributing groove should be slightly larger than would be used for oil lubrication to provide a reservoir to hold sufficient grease until the next period of application.

Heavily loaded, slow speed bearings, however, should have the point of grease application nearer the pressure area than at the top, and a distributing groove located in the bottom half ahead of the pressure area, as shown in Fig. 10, will as-

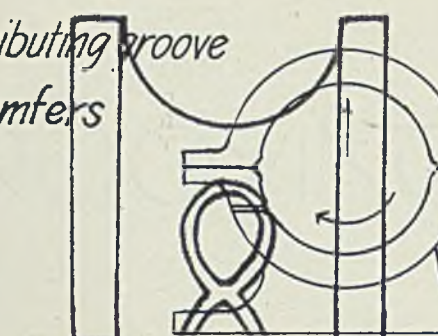
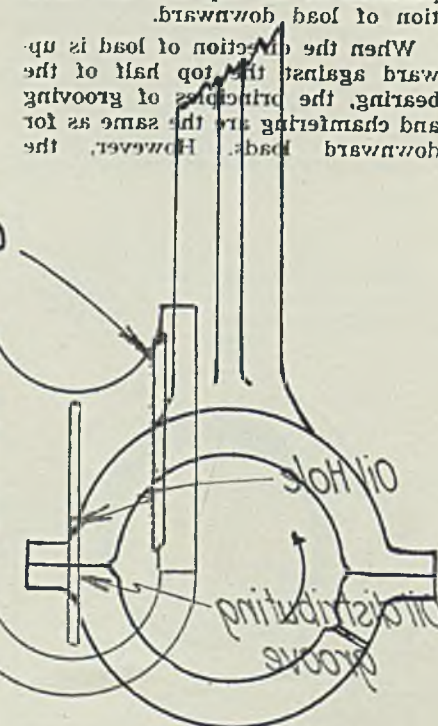
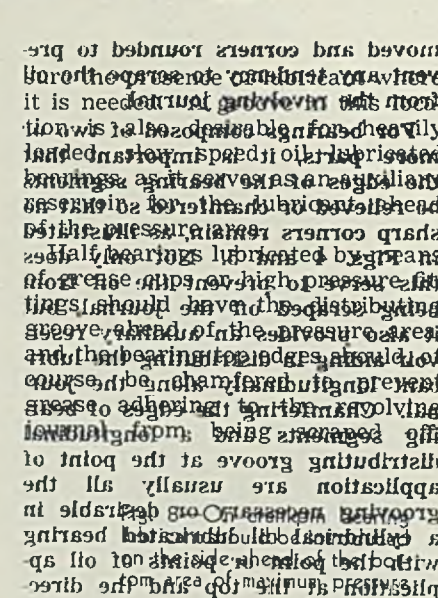


Fig. 5 (left)—Edges of bearing segments are relieved or chamfered to prevent oil being scraped off the journal. Fig. 6 (center)—For medium or high speed bearings where direction of load is upward against top half, oil hole can be located in the bottom half as shown. Fig. 7 (right)—For relatively slow speed bearings or those subjected to heavy loads, more effective distribution is obtained by locating the groove in the upper half ahead of the maximum pressure area.



journal completely from the bearing with a film of oil. This film is hydrodynamic in action and actually forces the journal to one side so that the line of pressure is not directly downward as when the journal is held out at an angle to the vertical region of gravity as shown in Fig. 1-B.

Ability of the oil film to lift and support a heavy load is dependent upon the fact that it is under hydrodynamic pressure as a result of the pumping action of the journal in the bearing. Obviously, any grooves in the pressure area which permit grease to escape from the top edge of the bearing will cause the journal to be held out at an angle to the vertical region of gravity as shown in Fig. 1-B. This will cause the journal to be held out at an angle to the vertical region of gravity as shown in Fig. 1-B.

The distributing groove should be well chamfered in the direction of rotation to aid in the formation of a lubricating film, and at the thrust end should be rounded in size and continued to the bearing end to permit lubricant to reach the thrust facing. The use of pockets between the ducts from the source of supply and the groove in the bearing will assist in the pressure and assuring even distribution. For a reversing mill, the same method of application should be used on the other side of the bearing. The angle of application should be about 45 degrees on either side of the pressure area. It is necessary to distribute the lubricant to the thrust facing.

Principles outlined in the foregoing illustrations apply to a wide variety of bearings and methods of application of the lubricant, with the necessary modifications to suit each individual case. These principles are briefly summarized in the following fundamental rules of bearing groove design:

1. Use grooves only where necessary for longitudinal distribution of the lubricant along the journal.
2. Do not cut grooves in the pressure area.
3. Chamfer or round off all sharp

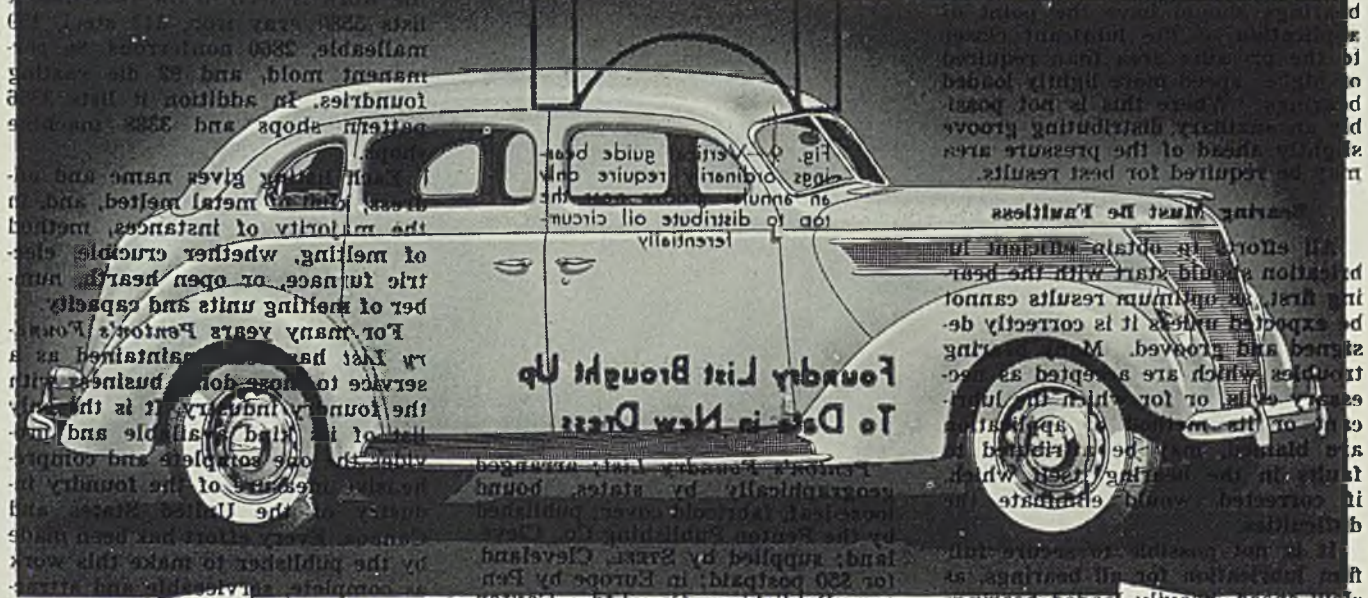
LARY coal furnace foundries in the United States and Canada has been revised and brought up to date for the first time since 1930. It is bound loose-size 6 by 9 inches, printed in typewriter type for easy reference and convenience in addressing envelopes. Blank letters or drawing of special lists, with listing arranged geographically by

Some idea of the completeness of this directory can be obtained by examining the list of contents. The directory is published in two parts, one for the United States and one for Canada. The United States part is published by the publisher to make this work complete. The directory is published in two parts, one for the United States and one for Canada. The United States part is published by the publisher to make this work complete. The directory is published in two parts, one for the United States and one for Canada. The United States part is published by the publisher to make this work complete.

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The Quality Car in the Low-price field

edges of bearing segments or grooves to prevent scraping the lubricant from the journal. To minimize end leakage grooves and chamfers should extend to within 1/16 inch of the bearing end. Locate the point of application of the lubricant in a portion of the bearing that is not under pressure, preferably at a distance of not more than 180 degrees ahead of the pressure area.



live as possible, no expense being spared in compiling the data. It should be an invaluable aid to individuals, firms, and institutions seeking to contact the industry.

This directory of gray and mal-iron steel, press aluminum permanent-mold, die casting and

Heavy loaded slow speed with intermittent methods of application of the lubricant, or grease, do not fulfill all the conditions required to support a fluid film of supporting metallic contact. However, regard- less of whether the film is partial or full, the bearing that is correctly grooved will operate with lower frictional losses and less wear and power consumption than those for which this important phase of lubrication has not been given due consideration.

85 HORSEPOWER
Maximum Performance with Good Economy
Bore 3.062 in. Stroke 3.75 in. Displacement 221 cubic inches

Two Engine Sizes - One Wheelbase AND A NEW LOW PRICE

The 1937 Ford V-8 for 1937 is the most car ever offered. It is built in only one size of roomy comfort and modern appearance. You may have either the improved 85-horsepower V-8 engine for maximum performance — or the new 60-horsepower V-8 engine for maximum economy. The smaller engine makes possible a lighter car — with lower operating costs — and a lower price.

FEATURES

- APPEARANCE**—A newly designed car. Headlamps recessed in fender aprons. Modern lid-type hood hinged at the back. Larger luggage space. Spare tire enclosed within body. Completely new interior. Slanting V-type windshield opens in all closed cars.
- BRAKES**—New Easy Action Safety Brakes, of the cable and conduit control type. The safety of steel from pedal to wheel. Self-energizing—cam mechanism is used to help apply the brakes. Tests show that about one-third less pedal pressure is required to stop the car.
- BODY**—Not an ounce of wood used for structural strength. Frame structure all steel, sheathed with steel panels—top, sides and floor. All are welded into a single steel unit of great strength. Safety Glass all around at no extra charge.
- COMFORT AND QUIET**—A big, roomy car. Extra space is in the body, not taken up by the engine under the hood. Comfort of the Center-Poise Ride further increased by smoother action of the long-tapering springs, with new pressure lubrication. New methods of mounting body and engine make this a quieter car.

When you drive the 1937 Ford with the 85-horsepower V-8 engine, you are master of a power plant that gives everything you can possibly demand in speed and acceleration. To-day's improved combustion enables it to deliver its thrilling performance with minimum gasoline consumption.

The new 60-horsepower V-type 8-cylinder engine delivers V-8 smoothness and quietness—even at speeds up to 70 miles an hour—with gasoline mileage so high that it creates an entirely new standard of economy in modern motor car operation.

We invite you to see the Ford V-8 for 1937—the quality car in the low-price field.

edges of bearing segments or grooves to prevent scraping the lubricant from the journal.

4. To minimize end leakage, grooves and chamfers should extend only to within 1/2-inch of either bearing end.

5. Locate the point of application of the lubricant in a portion of the bearing that is not under pressure, preferably at a distance not more than 180 degrees ahead of the pressure area.

6. Heavily loaded, slow speed bearings should have the point of application of the lubricant closer to the pressure area than required of higher speed more lightly loaded bearings. Where this is not possible an auxiliary distributing groove slightly ahead of the pressure area may be required for best results.

Bearing Must Be Faultless

All efforts to obtain efficient lubrication should start with the bearing first, as optimum results cannot be expected unless it is correctly designed and grooved. Many bearing troubles which are accepted as necessary evils, or for which the lubricant or its method of application are blamed, may be attributed to faults in the bearing itself which, if corrected, would eliminate the difficulties.

It is not possible to secure full-film lubrication for all bearings, as slow speed, heavily loaded bearings with intermittent methods of application of the lubricant, or grease lubricated bearings, do not fulfill all the conditions required to obtain a fluid film capable of supporting the journal with no metallic contact while in motion. However, regardless of whether full-film or partial-film lubrication is in effect, bearings that are correctly grooved will operate with lower frictional losses and less wear and power consumptions than those for which this important phase of lubrication has not been given due consideration, assuming other operating conditions are alike.

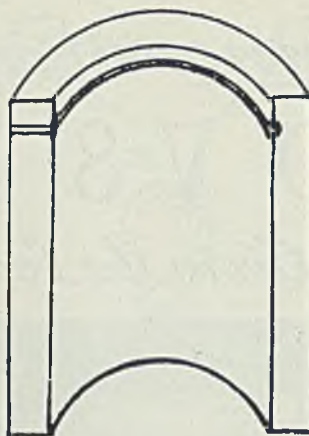
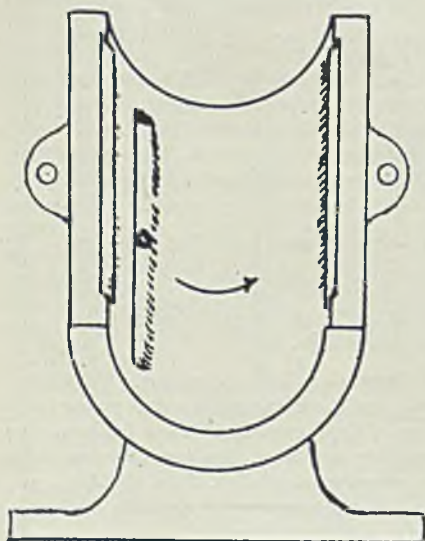


Fig. 9—Vertical guide bearings ordinarily require only an annular groove near the top to distribute oil circumferentially

Foundry List Brought Up To Date in New Dress

Penton's Foundry List; arranged geographically by states, bound loose-leaf, fabricoid cover; published by the Penton Publishing Co., Cleveland; supplied by STEEL, Cleveland, for \$50 postpaid; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This directory of gray and malleable iron, steel, brass, aluminum, permanent mold, die casting and ro-

tary coal furnace foundries in the United States and Canada has been revised and brought up to date for the first time since 1930. It is bound loose-leaf, page size 6 by 9 inches, printed in typewriter type for easy reference and convenience in addressing envelopes, filling in letters or drawing off special lists, with listings arranged geographically by towns and states.

Some idea of the completeness of the work is seen in the fact that it lists 3580 gray iron, 343 steel, 159 malleable, 2860 nonferrous, 86 permanent mold, and 92 die casting foundries. In addition it lists 3356 pattern shops and 3388 machine shops.

Each listing gives name and address, kind of metal melted, and, in the majority of instances, method of melting, whether crucible, electric furnace, or open hearth, number of melting units and capacity.

For many years *Penton's Foundry List* has been maintained as a service to those doing business with the foundry industry. It is the only list of its kind available and provides the one complete and comprehensive measure of the foundry industry of the United States and Canada. Every effort has been made by the publisher to make this work as complete, serviceable and attractive as possible, no expense being spared in compiling the data. It should be an invaluable aid to individuals, firms, and organizations seeking to contact the industry.

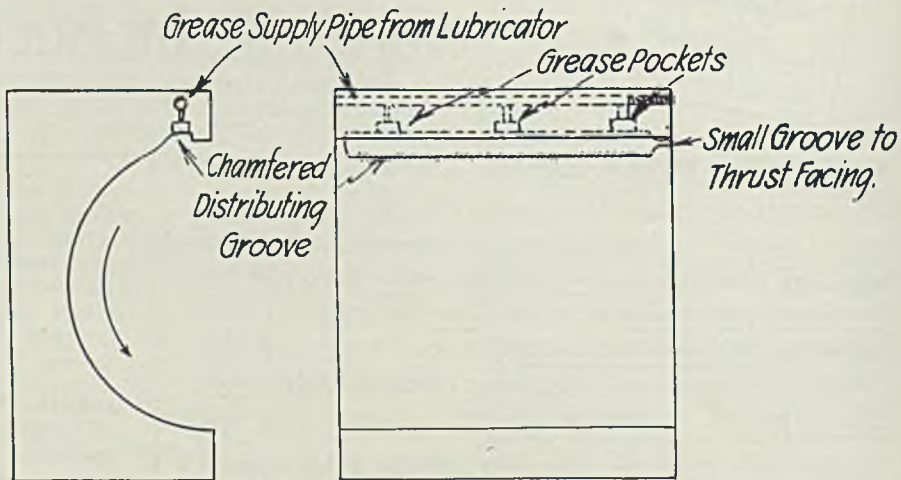


Fig. 11 (above)—Roll neck bearing designed for pressure grease lubrication. Because of the large size, more than one point of application is necessary

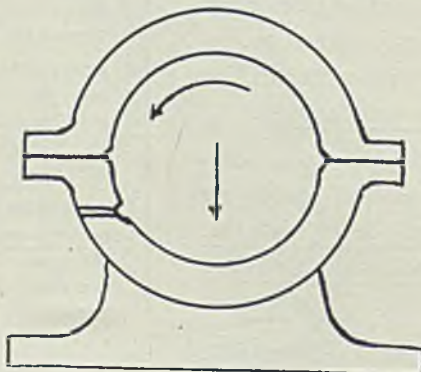
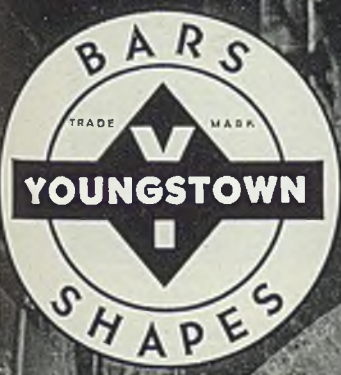


Fig. 10 (left)—Heavily loaded, slow speed sleeve bearings should have the point of grease application nearer the pressure area than at the top, and a distributing groove located in the bottom half ahead of the pressure area

YOUNGSTOWN

HOT ROLLED BARS AND SHAPES...

in forging steels....bolt,
nut, and rivet steel....
screw machine steel...and
steel for cold drawing

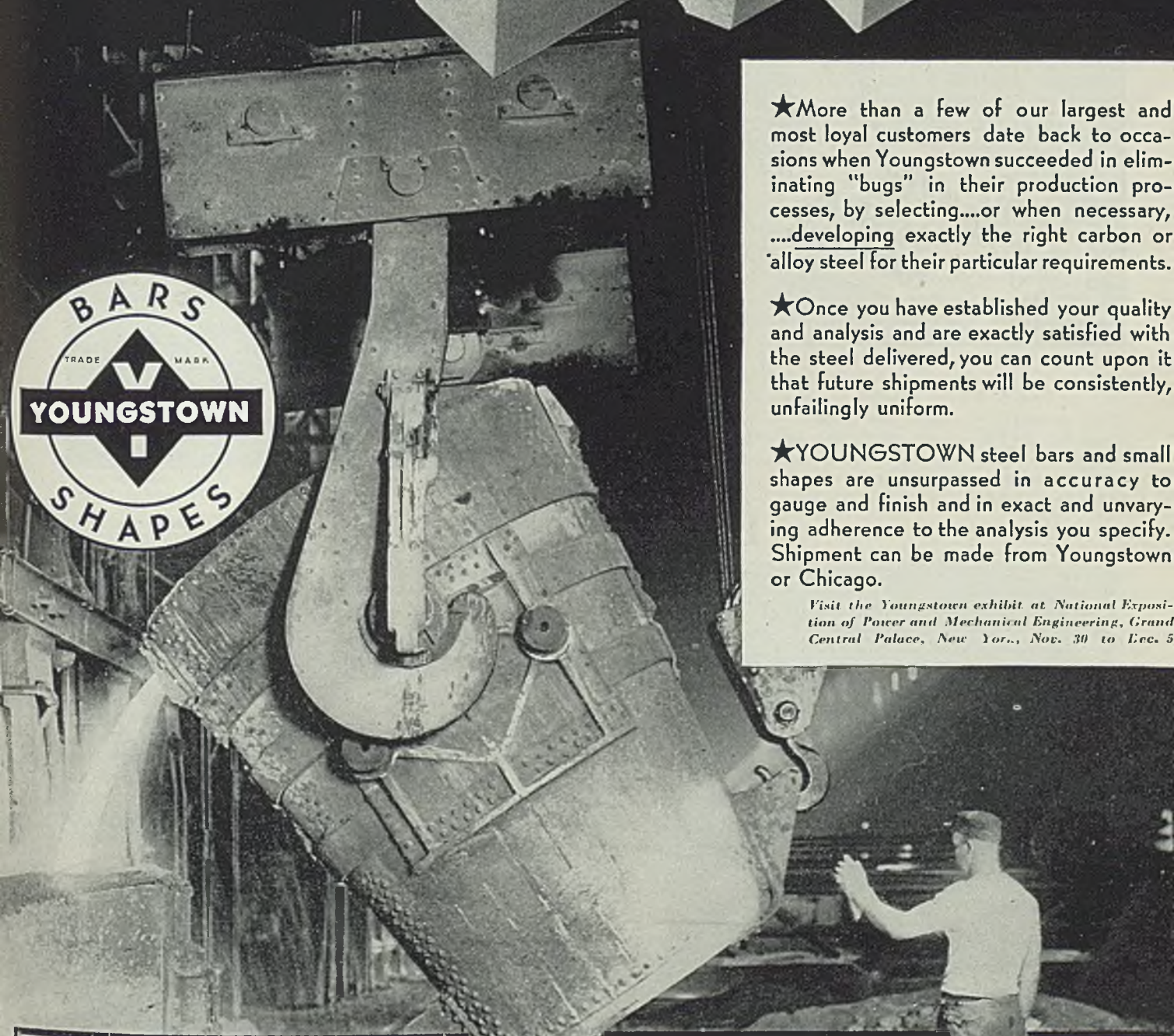


★More than a few of our largest and most loyal customers date back to occasions when Youngstown succeeded in eliminating "bugs" in their production processes, by selecting....or when necessary,developing exactly the right carbon or alloy steel for their particular requirements.

★Once you have established your quality and analysis and are exactly satisfied with the steel delivered, you can count upon it that future shipments will be consistently, unflinching uniform.

★YOUNGSTOWN steel bars and small shapes are unsurpassed in accuracy to gauge and finish and in exact and unvarying adherence to the analysis you specify. Shipment can be made from Youngstown or Chicago.

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Into Open
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A typical Standard Conveyor installation in one of the country's largest steel plants.

PLANNED material handling through efficient conveyor engineering will cut material handling costs . . . increase output of men and machines . . . build profits "inside the plant."

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Call in a Standard Engineer . . . there is one near you . . . to analyze and make recommendations for your mill.

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Materials Handling

Inspection of Equipment as It Relates to Safe Handling

BY K. A. COLAHAN

MATERIALS handling is one of the most outstanding divisions listed in accident-causing groups. The wide range of types of accidents recorded emphasizes the need for continued effort toward developing preventive measures that will be both practical and effective.

If we look at this problem coldly, we are likely to observe a multiplicity of accident possibilities that may tend to confuse our impressions. Why do so many accidents occur in the handling of materials? Certainly there are too many causes to permit a very brief answer to that question. It is said that all human beings are inclined toward carelessness, but such an opinion, if justified, would seem to indicate the futility of further effort to solve this problem.

Probably the first element needing improvement in connection with materials handling accidents is that involving the mental attitude of individuals exposed to this hazard. This probably includes every employe in a plant. Numerous instances have been recorded even in connection with the relatively non-hazardous clerical occupations.

Education Is Necessary

The primary move then should be one of education and instruction, to be followed, continually, by a supervisory interest to detect obviously unsafe working practices and bring about a quick correction. In other words, it is necessary to develop a safety consciousness on the part of those exposed to this and other hazards. The most efficient handling equipment will not prevent acci-

dents if the attitude of persons using it is indifferent or negative. Assuming, therefore, that we have a careful class of people observing all safety requirements and precaution, we have an obligation to see that the equipment they utilize is in mechanically safe operating state under all conditions of use.

The hazards of crane operations are generally well recognized, and a careful inspection would include tests of limit switches, clarity of vision by the operator, proper functioning of electrical equipment, effective warning means and a most

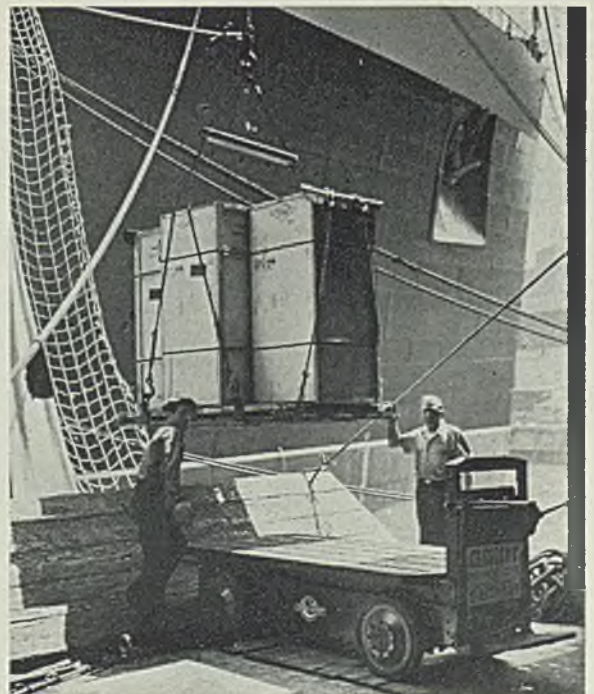
careful examination of hooks, cables or chains, and blocks.

On all types of hoists or carrying equipment, where chains or wire ropes are used either for hoisting or as slings, the examination should be most thorough. This provokes an old question as to the annealing of chains. Many plants are not equipped to perform a dependable annealing job, and considerable damage can be done if chains are not annealed properly. It is considered better, therefore, that chains be not annealed unless necessary facilities are available for performing the job properly. A complete record of each chain should be maintained. In the use of wire ropes there is further need for minute and careful examination.

Danger Arises in Use

While the factor of safety is very ample in the early stages of use, conditions frequently are encountered during the use that tend to greatly lessen the original margin

A BREAK in a rope, or defect in hook or sling, in an operation such as this might result in serious injuries to the workmen. This constitutes an ever-present hoisting hazard when careful inspection of materials handling equipment and accessories is overlooked



of safety. Kinks frequently are disastrous especially when the kink is in the range of travel over drums, sheaves or blocks. Wire ropes should be guarded against kinks or severe bruising. No less important than chains and wire ropes are the various types of hooks. These should be of the safety type and examined closely for evidence of strains or deformity. It is highly desirable that, when possible, hooks be so constructed as to permit of attachment with safety to the hands.

The industrial truck has contributed its quota of injuries, both to the operator and to others. While this type of equipment is dependable mechanically, its ease of operation permits of speedier travel and this, in turn, sometimes leads to accidents. Brakes and warning facilities are important and should be checked frequently.

Vision Must Be Good

Other types of equipment also contribute to the injury of workers. Within the past few weeks, a molder was burned critically when a gang, pushing a crucible of hot metal, was unable to see clearly the position of the monorail switch and spilled a large part of the metal over the molder sitting in its path. In this case, the monorail switch should have been marked clearly to show its position.

Both large and small plants share in these materials handling hazards, as well as other dangers. For instance, manual handling is performed extensively in all kinds of plants, and the need for gloves, palm leathers or other protective equipment is common. Where injury to the hands is probable, inspection of the protection worn should be made. Inspections should go beyond the condition of equipment

THE accompanying article constitutes excerpts from a paper presented at the Western Pennsylvania Safety conference in Pittsburgh, Nov. 13. The author, K. A. Colahan, is district engineering manager, American Mutual Liability Insurance Co., Philadelphia.

and should consider frequently circumstances under operation. Recently a well-constructed hoist fully enclosed with an acceptable screen enclosure permitted considerable quantities of fine sand to blow against the hoist operator's face.

The goggles worn by this man were entirely unsuitable and poorly fitted. The handling of loads on that hoist was hazardous on every trip and inspection of the circumstances seemed to be in order.

Elevators also are a distinct source of hazard in handling materials. We frequently find loaded trucks placed on elevator cars with insufficient clearance remaining for the truck handlers. Elevator sides and entrances should be provided with substantial standard enclosures and gates.

Elevators Constitute a Hazard

Inspection of elevators should be made carefully to cover the condition of gates or doors, and particularly of hoistway entrance gates or doors; operating mechanism and car safety device, as well as limit stopping switches or devices. Equalization and extent of wear of cables, plus any other weakened condition, should be noted and necessary corrections or replacements promptly made.

Generally in the plant where the

safety of working personnel is considered important, this kind of attention is given not only to types of equipment specifically rated as materials handling, but also of innumerable other kinds, especially where parts are subjected to unusual or excessive strains occasionally. For instance, the clamps, brackets or collars frequently used on stationary loading masts are subjected to a wide range of directional stresses.

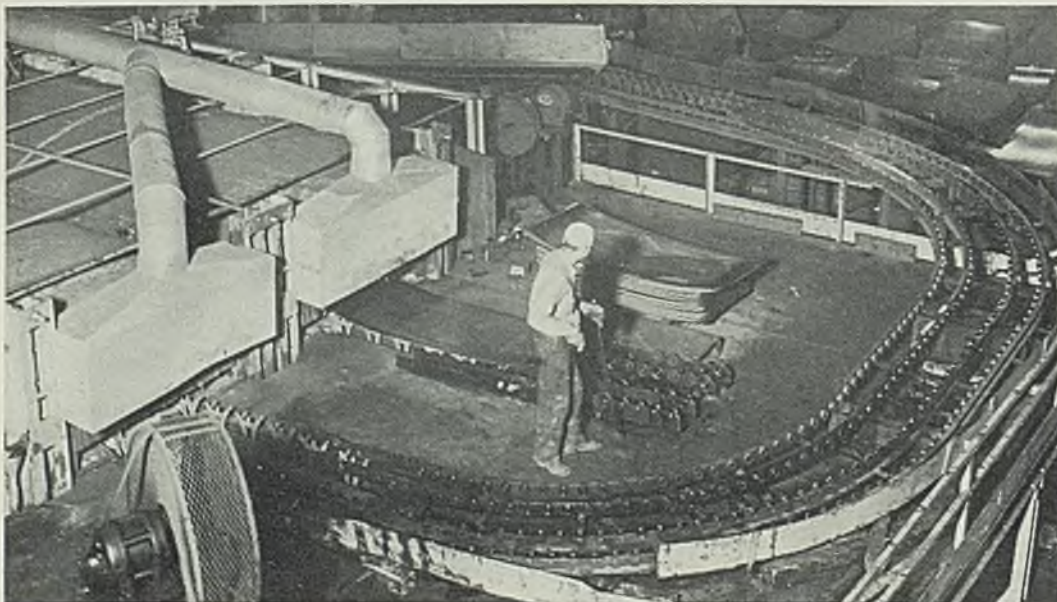
Breaks Occur Unexpectedly

When overloading also enters the picture, it would be wise to inspect carefully these collars or clamps since they do, from time to time, fail unexpectedly. A recent clamp break resulted in a fatality, and examination of the bracket showed a partial break approximating 50 per cent that evidently had existed for a long time. This type of failure usually results in one or more severe injuries.

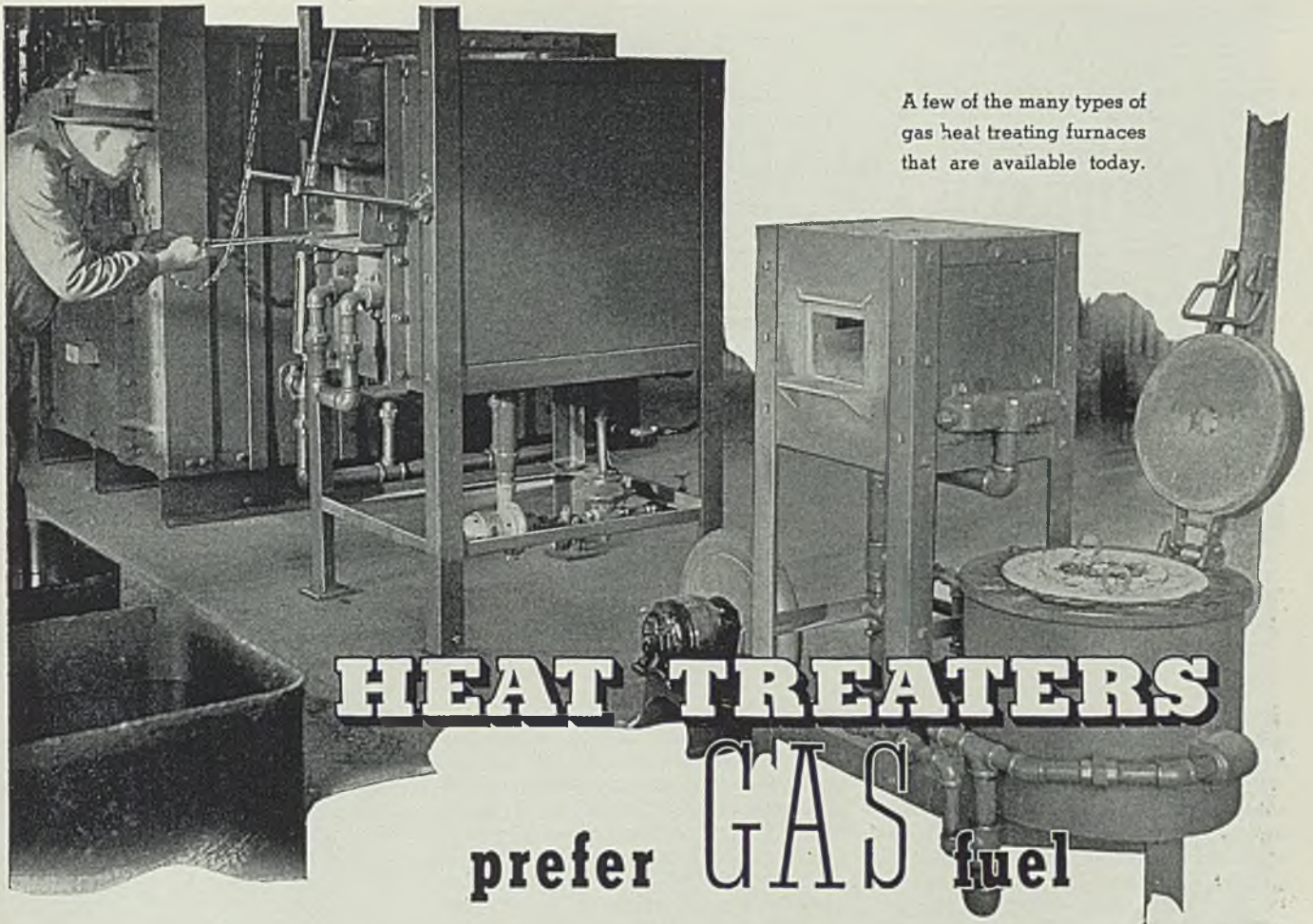
The operation of shovels adds additional types of hazards. Generally, the basic hazards from a handling standpoint are somewhat similar, but they differ from an operating standpoint. Ropes, blocks, hooks and hatches should be regularly and frequently examined. In the case of tractor driven equipment, clutches should be tested and repaired promptly. A failure of this kind can cause much trouble and probably injury. Recently, a piece of equipment of this class backed over a bank and fell 150 feet, due to a sticking clutch. The loss involved was approximately \$18,000, which is a stiff price to pay as a penalty for neglect.

Specific references to equipment only touch on the prominent kind of equipment likely to be found in the average plant in the metal industry.

(Please turn to Page 58)



THIS operator, whose job is an important manual handling one, feeds sheets from a wheel conveyor loop to a furnace, into which the sheets roll on a section of wheel conveyor. Note that the operator's hands are protected by safety gloves — an essential measure. Photo courtesy Mathews Conveyor Co.



A few of the many types of gas heat treating furnaces that are available today.

HEAT TREATERS prefer GAS fuel

In small heat treating shops and in large industrial plants with heat treating departments, Gas has long been the preferred fuel. This is significant, because the heat treater knows that his reputation and future depend upon the quality of his work. And both he and the plant operators have found Gas to be more dependable and more satisfactory. They have found that Gas is more flexible, more easily controlled, more accurately controlled, more convenient, cleaner, and more economical.

Today, the preference for Gas in heat treating shops, is increasingly pronounced. Modern and more efficient applications of Gas—for forging, carburizing, core-baking and many other processes—have been made possible by important research developments. And this combination of dependable gas fuel and up-to-date equipment is improving quality, reducing the number of rejections, increasing production and lowering over-all costs in heat treating shops everywhere.

company industrial engineer for detailed information regarding the application of Gas to your special heat treating operations.

INVESTIGATE THE ADVANTAGES OF GAS FOR:

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- Carburizing
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- Blueing
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- Forging
- Galvanizing
- Core Baking
- Spheroidizing
- Malleablizing

And many other processes.

You, too, will want to take advantage of the new economies and new efficiencies offered by gas fuel today. Call your gas



AMERICAN GAS ASSOCIATION

INDUSTRIAL GAS SECTION: 420 LEXINGTON AVENUE, NEW YORK CITY

SURFACE TREATMENT

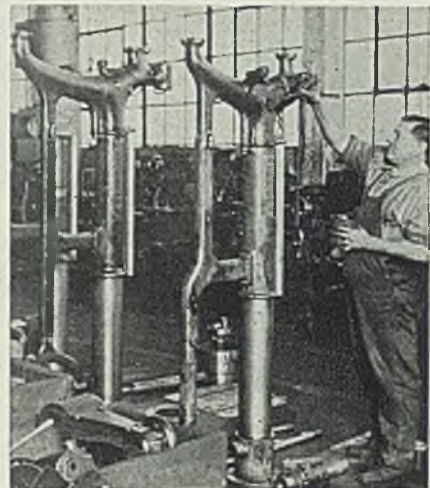
AND FINISHING OF METALS

Reconditioned Machines Refinished To Insure Attractive Appearance

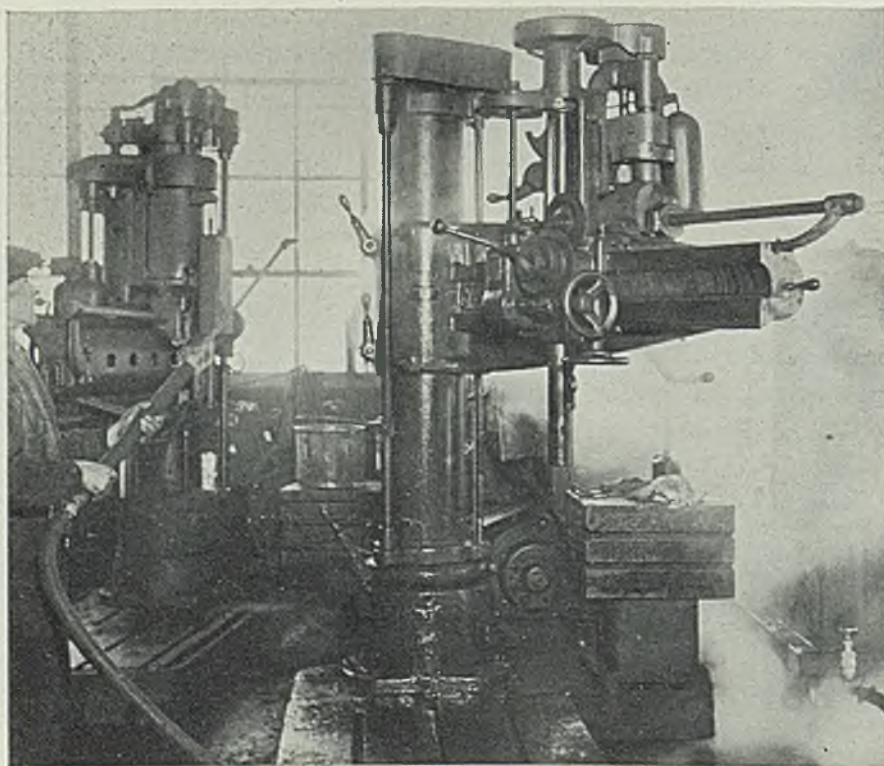
MACHINE tool dealers, like automobile dealers, frequently take used machines in trade when selling new machinery. These machines are received in various stages of mechanical wear and despite heavy protective coatings of grease are usually covered with a certain amount of rust. This together with the dirt accumulated in the grease during shipment cause the machines to present a very un-

sightly appearance. In this condition they can neither be overhauled nor shown to prospective buyers, and the dealer must have the means at hand economically to prepare these machines for resale.

Before a machine can be resold it must be placed in good mechanical condition and refinished to present an attractive appearance. There might be some inclination to under-rate the value of an attractive fin-



Oil base filler is applied by brush to the repaired machines as illustrated



Used machines are received in a greasy, dirty condition which requires the use of high pressure steam cleaning. A commercial cleaner is usually added to the feed water of the portable boiler which can be seen in the background to the right

ish on a reconditioned machine tool but experience has proved that a poor finish creates the impression of poor mechanical condition to the observer and for this reason it will be found that the product of ethical and reputable dealers in reconditioned machine tools compares very favorably with new machinery both from a mechanical and appearance standpoint.

Examples of good practices in machine tool reconditioning are shown in the methods used by prominent dealers in this equipment. In one plant, all machinery when received is stored in a cleaning room. Here it is subjected to the cleansing action of a portable high pressure cleaning machine, which vaporizes a water solution of commercial cleaner and ejects it through a nozzle at high velocity. This combination of high pressure steam and cleaning agent not only removes grease and dirt but loose paint and filler as well. By adjusting the concentration of solution and time of operation, the machines can be cleaned down to the bare castings if desired. The operation of the device is shown in an accompanying illustration.

The cleaning serves a multiple



COORDINATION

● One slip and this feat fails. Only the perfect coordination of nerve, mind, and muscle spells success . . . In steel making only the skillful coordination of many metallurgical factors during the melting of a heat spells success. Every operation must "click". The correct amount of the right ferro-alloys must be added at the proper time under the most suitable operating conditions.

Since 1906, Electromet has made the right ferro-alloys. Electromet Metallurgists, with years of practical experience

in steel making, can help you use them under the *right* conditions to make better steel. Avail yourself of this service. It may save you much and will cost you nothing.

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Electromet
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THE TIME HAS COME, THE WALRUS SAYS, TO THINK OF



INVITATION

MR. MANUFACTURER: Without any doubt, the next few years (even months) will see many new products and old products, perhaps some of them competitive with your own, made better and more attractive and more saleable . . . through the skillful use of USS Stainless Steel.

Manufacturers who wish to investigate, today, the possibilities of improving their product or service with USS Stainless Steel are invited to write our nearest District Office. They may write freely, in full confidence, with no subsequent obligation.

Their inquiries will receive the attention of stainless steel specialists of wide experience in many fields — and, if necessary, be investigated in modern laboratories where the most advanced equipment is available to study any problem for which the answer is not already known.

Make no mistake about it—the trend to USS Stainless Steel has just begun. Countless opportunities remain to be explored.



HOW TO MAKE the most out of a small location. Lustrous store fronts of USS Stainless Steel attract more customers because people naturally identify "stainless" with "cleanliness".



HERE'S A NEW way to whet appetites —brilliant fountain, bar and restaurant equipment of USS Stainless Steel which stays brilliant. Stainless steel is the only commercial metal which is permanently immune to all food products.



THE BURLINGTON'S new Zephyrs make 1039 miles between and Denver every night. Even the rural members of these complete trains are made of stainless steel.



Stainless Steel

For railroad trains and air-o-planes
And ships with stainless keel

For boudoirs, beds and valve-in-heads
For plaques and plats and platters
For water gates and dental plates
And other wondrous matters . . .



The original Walrus and the Carpenter — as illustrated in Alice's Adventures in Wonderland.

JUST a few years ago, stainless steel was thought of only in connection with cutlery.

Then some adventurous architect tried trimming a building with stainless steel . . . and the owner was delighted. He found that stainless steel gave it an air of modern dignity, never needed polishing, kept his building always looking young.

A motor-car maker beautified his car with stainless trimming which simply couldn't rust because it was "stainless" all the way through . . . and he found it helped him sell more cars.

A watch maker started putting his watches in strong cases of silvery stainless steel which were machined so closely that people could even wear his watch in swimming . . . and of course he began selling more watches.

A restless engineer designed a new kind of train . . . and thanks to stainless steel

this train cost less to run because it was lighter; attracted more fares because it gave people the kind of a ride they wanted.

Before long, all kinds of people began making all sorts of things out of this wondrous new metal. But the important fact is that practically every experiment with stainless steel was an outstanding success.

Even more important are the opportunities still undeveloped. In the days ahead, there will be many more successful developments in stainless steel which will earn money and fame for the people who make them.

The Walrus is right-er than he thinks. The time has come when every manufacturer — whether he sells razors or soap or milk or transportation — should investigate the improvements and savings now possible with USS Stainless Steel.

SUGGESTION

MR. BUYER: In USS Stainless Steel, metallurgy has closely approached "the perfect metal." In countless applications this brilliant new metal is permanent; it effectively resists every destructive force of nature — stress, wear, corrosion, heat, and time itself.

Whenever you are considering any important purchase, we suggest you investigate the possibility of getting a better piece of equipment made wholly or partly of USS Stainless Steel. Almost without exception, the product which benefits through the unusual properties of USS Stainless Steel will be more attractive, last longer, cost less for maintenance, do a better job for you . . . give you more value per dollar spent.

Our nearest District Office will be glad to recommend competent fabricators and sources of supply skilled in making better products of USS Stainless Steel.

Remember that in many products, there is no known limit to the useful life of USS Stainless Steel; it will stay "brand new" forever!



FOR HARDWARE like kick plates, push plates and hinges, USS Stainless Steel is ideal. It stays permanently brilliant with only an occasional wash. It is so tough and wear-resistant that it should outlast the building.



THE FLEETWINGS' "Sea Bird" amphibian is stronger, safer, and over 200 lbs. lighter than equivalent planes of conventional construction. USS Stainless Steel was specified for every part except motor and wing covers.



THREE BIRDS with one stone . . . This smart New York bakery truck of gleaming stainless steel saves weight, reflects heat, makes a most effective advertisement.



FROM BAGHDAD to Damascus, this air-conditioned stainless steel trailer bus will soon whisk you across the Arabian Desert in a single day. Stainless steel made possible the weight reduction which made possible the necessary capacity.

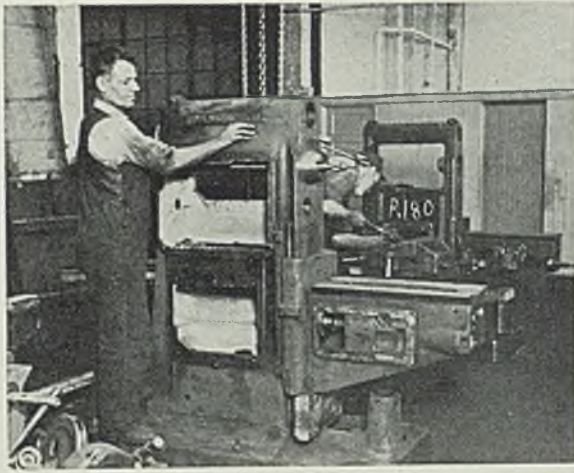
U·S·S STAINLESS STEEL

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

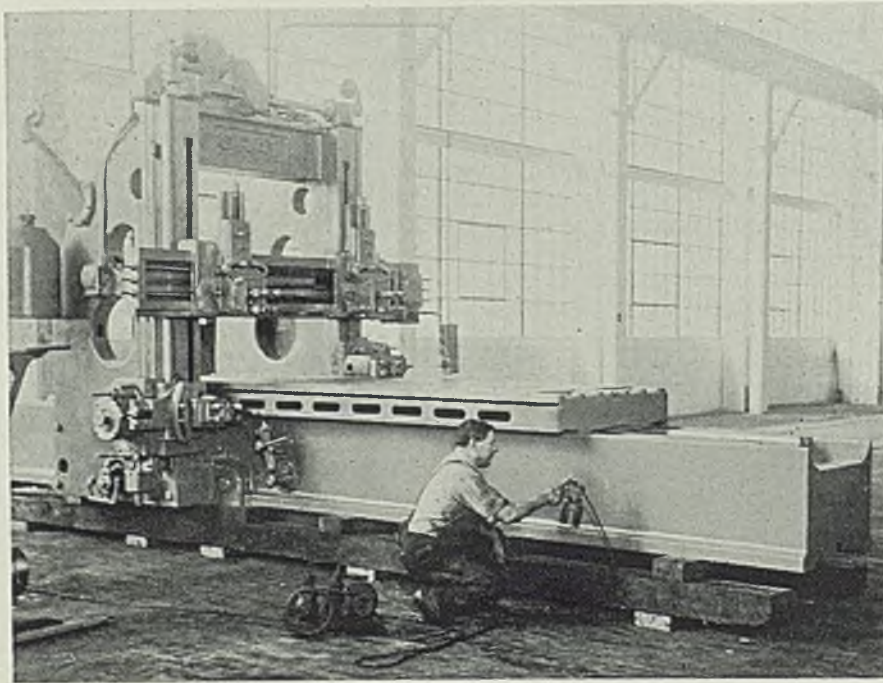
Columbia Steel Company, San Francisco, Pacific Coast Distributors · United States Steel Products Company, New York, Export Distributors



UNITED STATES STEEL



AFTER the filler has dried 12 hours, it is sanded by hand, as shown at left, where operator is finishing a milling machine. Below a workman is applying finish coats of machine paint with a portable spray machine. Planer illustrated here has been completely overhauled and finished

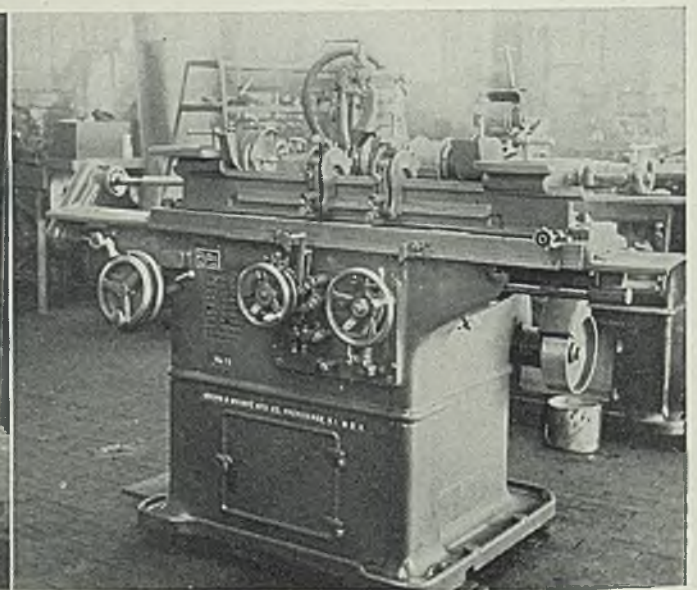
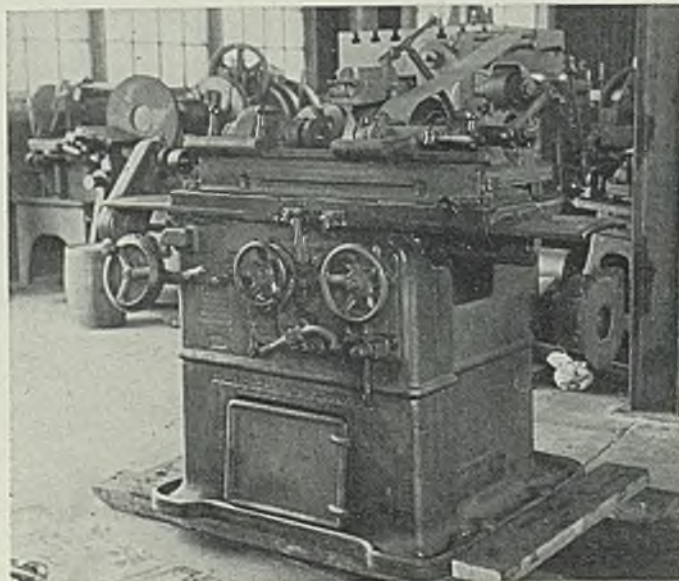


purpose. It permits close inspection of the machine for mechanical defects, cracked castings and the like; it eliminates extra labor on the part of the machinists who dismantle, repair and reassemble the machines; and finally it prepares the machine for refinishing except for a final cleaning with gasoline.

After the inspection which follows the cleaning the machines are sent either to the machine shop for immediate reconditioning or are stored in a large warehouse for future use. After the machines have been cleaned free of grease, some measure of protection from moisture must be afforded them in storage. This is usually done by applying a temporary coat of paint to the rough parts and a coating of light oil to the machined parts. In some cases only oil may be used over the entire machine. A machine sent to the shop is first set up and operated by a trained mechanic, who observes its performance and the limits of accuracy to which it will work. The next step is to dismantle the machine completely and determine the amount of wear on the moving parts. Worn parts which cannot be repaired are discarded and new parts ordered. The rest of the machine is placed in the hands of skilled mechanics who overhaul it and place it in good mechanical order. This work calls for a high degree of mechanical skill and a far-sighted policy has been pursued in training apprentices.

After the castings have been machined they are washed with gasoline or some other suitable solvent to clean them free from grease and oil. A liberal coat of oil base filler

(Please turn to Page 72)



The complete rehabilitation which a used machine undergoes can be seen in these two illustrations. Left shows a small grinder as it appeared in the warehouse awaiting re-

pair. Right is shown the same model grinder after it has been completely overhauled and refinished. The appearance of the newly-finished machine inspires confidence



Plates of **FOURSQUARE** Steel

Steel plate in recent years has developed a personality. Modern machine design calling for built-up welded-plate-construction has more than doubled the usefulness of the standard steel plate.

CENTRAL OPEN HEARTH sheared and universal

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 Sheared and Universal Plates
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 High Tensile Steel
 Blue Annealed Sheets
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STEEL PLATE, produced consistently to uniform standards, provides the necessary versatility. "**CENTRAL-IZED**" supervision (83 years of specialization) of production has done much to advance plate "usefulness" in current design.

CENTRAL OPEN-HEARTH STEEL PLATES

CENTRAL IRON AND STEEL COMPANY, HARRISBURG, PENNA.

WELDING, etc.

by Robert E. Kinhead

Instrument Qualification of Welding Operators

Expansion of production schedules in many welding departments has brought about renewed interest in the matter of developing instruments to qualify arc welding operators while they are doing productive work. Considerable numbers of inexperienced operators in a department accentuate the need for automatic instrument control of the quality of work.

Curve drawing voltmeters, ammeters and wattmeters have been used successfully. Later, a welding man in the navy built an instrument which combined measurements of these factors in a curve drawing instrument of great accuracy. There are a number of installations of chart drawing mechanisms which show the approximate time the operator was trying to weld but give no indication as to what kind of success he was having.

Field tests are now being carried out with electrical equipment designed to show the amount of time

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

the operator was actually welding in a normal manner, and the time he was welding in a manner previously established as being unsatisfactory. Thus, the instrument might show that in eight hours elapsed working time, that the man was doing welding in the normal manner 3 hours and 10 minutes and that he welded in an unsatisfactory manner 12 minutes. This might constitute a good record, all things considered.

While it is recognized by those who are experienced in welding production that highly skilled welding operators of adequate experience need no qualification of any kind, instrument control will operate in the direction of bringing the other

kind of operators into line or eliminating them.

Use of instruments for continuous qualification of operators may offer a solution to the perplexing problem of how to reward the skilled operator who does a good job.

♦ ♦ ♦

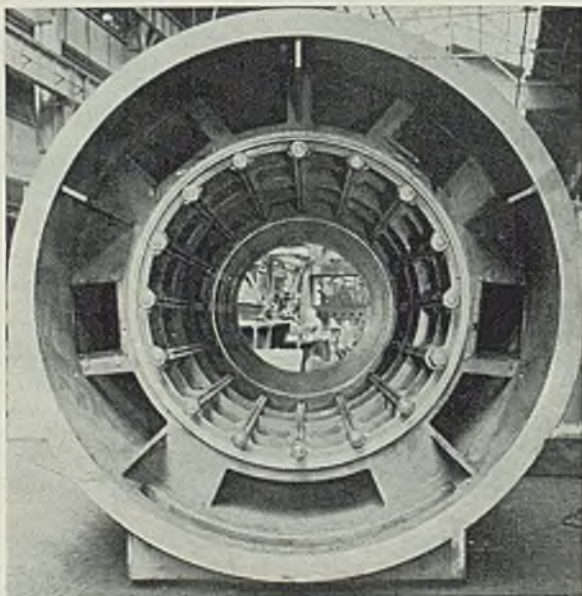
Trends in Welding

WAGES of welding operators have been increasing for eighteen months. Continued recovery of lagging industries and extension of production in industries which are now operating at 75 per cent and above normal capacity will accentuate this trend. Budget balancing in industrial welding departments is as much in order as in government if a return to the days of "profitless prosperity" is to be avoided. Reduction of wages is out of the question now, and for some time to come. Wage increases must come from increase in productivity of labor.

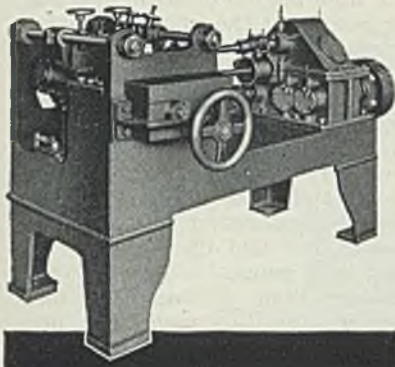
Wage incentive systems are likely to become more popular. Machinery increasing the output per man hour will be installed. It is significant that it requires a considerable amount of time to get a wage incentive system or machinery into effective operation to accomplish the main purpose of increasing the productivity per man hour. To wait until manufacturing costs have increased to the point at which profits have disappeared means also another wait of six to nine months after the proper steps have been taken until the new set-up is producing profits. If the trend is acknowledged, whatever moves are undertaken should be started immediately.

On the whole, the welding industry is from two to three years ahead of the users of machinery and ideas for increasing the productivity per man hour. This is a condition arising from unwillingness to make capital expenditures or inability to do so,—mostly the latter. Strong units in production started spending in this direction more than a year ago. The necessary machinery and ideas are available to increase greatly the productivity per man hour.

Hydrogen Cools Turbine Generator



SIGHTING through hydrogen-cooled turbine generator, the camera has caught a workman in the Schenectady shops of the General Electric Co. The mammoth part is a stationary armature frame for a 25,000-kilowatt hydrogen-cooled turbine generator under construction for the Dayton Power & Light Co. This view, taken at the connection end, shows the frame ready to receive the laminations



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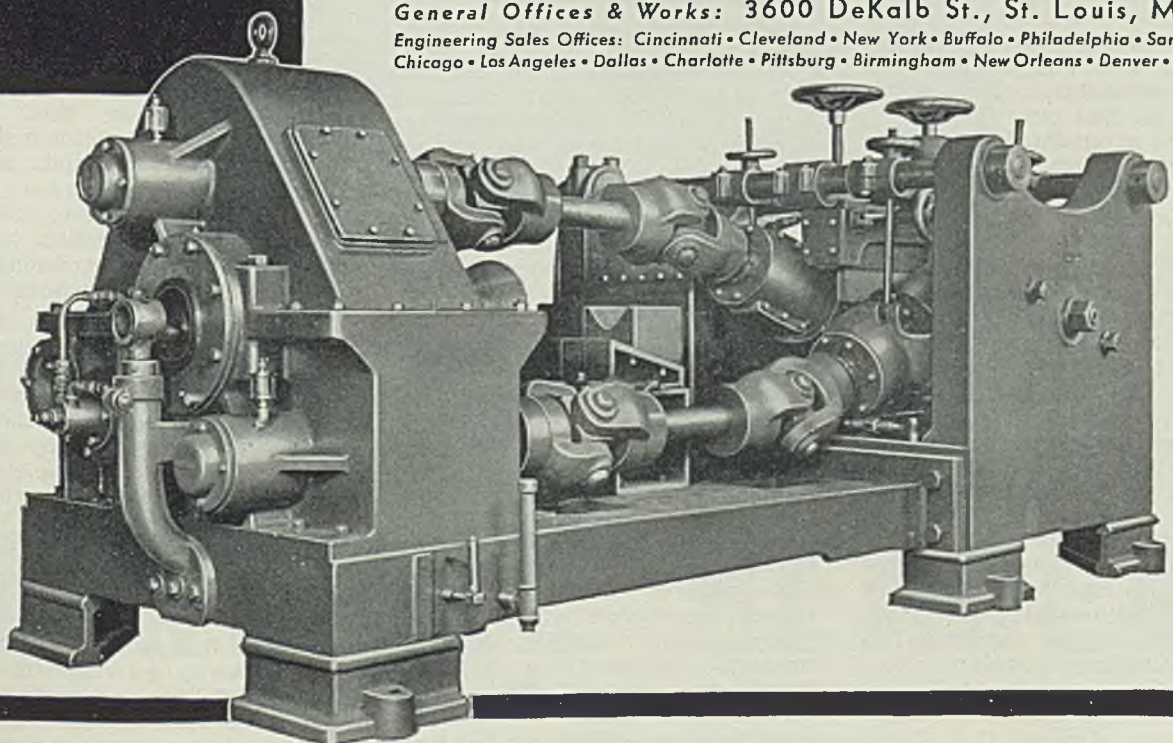
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A. S. M. Symposium Broadens Knowledge on Plastic Working of Metals

Part I

A MOST comprehensive symposium on the plastic working of metals featured the annual convention of the American Society for Metals held in Cleveland, Oct. 19-23, during the eighteenth National Metal congress. Occupying the time of four sessions, this symposium consisted of the presentation of 17 technical papers and considerable pertinent discussion.

Among early papers on the program were several which sought to bring out the fundamental principles and concepts of plastic working to afford clearer understanding of production process papers to follow. Subjects considered in the symposium embraced creep, damping capacity, X-ray crystal analysis, deformation energy, hot and cold working, forging practice, extrusion, cold heading, cold forming, cold rolling and deep drawing.

By way of introduction to the subject of plastic working, A. V. de Forest, Massachusetts Institute of Technology, Cambridge, Mass., reviewed briefly the laws and fundamentals of plastic deformation. In so doing, he predicted that our views as of 1936 will be as out-dated as our present automobiles when another decade has gone by.

Starts With Single Crystals

Some of the most significant features of plastic deformation are thrown into sharp relief by consideration of single crystals, said S. L. Hoyt, director of metallurgical research, A. O. Smith Corp., Milwaukee, in a paper designed to correlate the relationship between metallic single crystals and plastic deformation. By proceeding from the simple to the complex, he pointed out, factors of grain boundary conditions, varied or random orientation, and constraint of movement of the polycrystalline state can be more clearly differentiated from the factors of crystalline slip, twinning, and strengthening or work hardening.

Contributing a paper on creep characteristics of metals, C. L. Clark,

research engineer, and A. E. White, director, department of engineering research, University of Michigan, Ann Arbor, Mich., discussed the various factors which may influence high-temperature load-carrying ability. Among those considered were chemical composition, structural uniformity, heat treatment, method of manufacture, grain size, previous deformation, equicohesive temperature, and structural stability.

Many Factors Affect Creep

On the basis of test results, the authors concluded that the ability of a metal to resist creep is a sensitive property which is greatly influenced by many factors that have little or no influence on the remaining physical properties usually considered. In other words, there are many factors other than composition which affect creep resistance and check results will not in general be obtained from steels in which only this factor had been maintained constant. Before values from one steel may be applied to another of the same composition it is necessary to know the history of both steels.

Desired operating temperature determines the most suitable chemical composition. At temperatures below the lowest temperature of recrystallization (equicohesive temperature) the creep resistance may be increased either by certain elements which largely enter into solid solution in the ferrite, such as nickel and manganese, or by the carbide-forming elements, such as chromium, molybdenum, tungsten and vanadium. At temperatures above the lowest temperature of recrystallization, however, the carbide forming elements are the most effective in increasing creep strength. In fact, at these more elevated temperatures the creep resistance of pearlitic steels often is decreased by addition of the noncarbide-forming elements.

Nonuniform distribution of the various constituents will in general decrease creep resistance, since the strength of the steel as a whole will depend upon that of the weakest portion of the mass.

Heat treatment should be such

that a high degree of structural stability results at the given operating temperatures. For the higher operating temperatures annealing is in general the most satisfactory although a normalizing or quenching treatment can be used provided it is followed by a drawing temperature approximately 200 degrees Fahr. above the operating temperature. A normalized and drawn structure possesses in general a greater creep resistance than an annealed one, although annealing generally produces greater creep resistance at the more elevated temperatures than oil or water quenching.

Creep resistance is likewise influenced by the melting process, melting practice and casting practice. Results available indicate electric furnace steel to be superior to open hearth, while induction furnace material is superior to electric furnace steel. For any given melting process, killed steels are superior to the open or rimmed type.

Influence of both actual and inherent grain size on creep resistance varies, depending upon temperature considered. At temperatures below the lowest temperature of recrystallization, a fine-grained steel (either actual or inherent) possesses the greater creep resistance, while at temperatures above, a coarse-grained structure is superior.

Initial cold deformation decreases the creep resistance at temperatures above the lowest temperature or recrystallization with the differences being more pronounced at the more elevated temperatures. Under sufficiently prolonged testing periods, however, these differences would probably be largely eliminated.

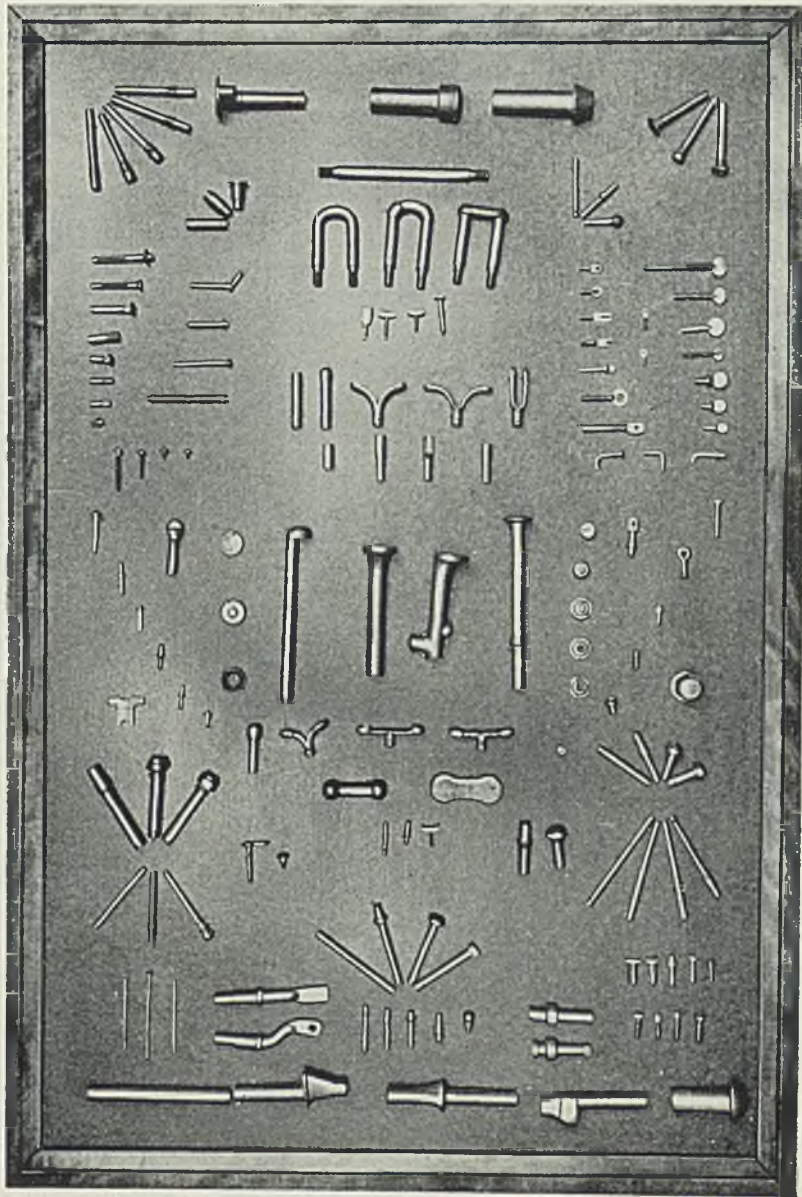
Temperature Is Important

Equicohesive temperature, or lowest temperature of recrystallization, is believed to be critical insofar as creep resistance is concerned. At temperatures below this, strain hardening predominates and stresses of appreciable magnitude can be withstood without continuous creep. At temperatures above, however, the rate of recrystallization will exceed the strain hardening rate and continuous creep will occur under very low stresses.

In general, it may be stated that the greater the structural stability, the greater will be creep resistance. As pointed out, however, there is a question as to whether any type of structure possesses complete stability especially at the more elevated temperatures.

In conclusion, Mr. Clark and Dr. White said it should be emphasized that while their paper was confined largely to a discussion of creep characteristics, this property alone does not necessarily determine the complete suitability of a material for high temperature applications. Proper consideration must be given also

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to the remaining physical properties, such as oxidation and corrosion resistance, ductility, and impact strength if entirely satisfactory results are to be obtained.

Contributing a discussion, F. H. Norton, Massachusetts Institute of Technology, Cambridge, Mass., said the authors had brought out the very real differences in creep properties of steel manufactured by different methods. Their paper makes it possible to judge the value of various alloying constituents in steel as influencing creep, and the picture leads one to believe that there are still great opportunities to produce alloy steels of even better creep resistance than are now available.

It is undoubtedly true, Mr. Norton continued, that the treatment which produces in the quickest time a final stable structure will be the best. There is some doubt, however, if such a final condition can be arrived at without taking a considerable length of time. From his tests he had found that specimens annealed for 1000 hours, at, or slightly above test temperature, reach a uniform condition of flow quicker than specimens annealed a short time.

Interpretation and use of creep results were considered in a paper presented by J. J. Kanter, assistant chief chemist and metallurgist, Crane Co., Chicago. He said that acceptance of creep as a factor in the design of structures for operation at high temperature necessitated a critical interpretation of laboratory test results. Discussing various factors affecting creep, the author stated that selection of materials for high temperature application should be made upon creep tests showing the position on the scale of temperature with regard to working stress. Working stresses must be determined upon a strict interpretation of creep tests with regard to total deformation tolerable.

Studies Damping Capacity

In a paper discussing damping capacity, and its variation and relation to other physical properties, G. R. Brophy and E. R. Parker, research laboratory, General Electric Co., Schenectady, N. Y., stated that damping capacity, or plasticity, of steel is greatly influenced by such factors as stress, chemical composition, structure, heat treatment, mechanical work and temperature. In addition to dealing with these factors, the paper considered the relation of damping capacity of fatigue and creep performance.

Damping capacity is particularly important in determining differences in behavior of steel, when repeatedly stressed, to the effects of overstress, stress concentration and speed, the authors pointed out. The order of creep resistance of a series of steels at elevated temperatures may be predicted from determining

the damping capacities at the desired temperatures, provided there are no structural changes other than grain size.

As a property, damping capacity is of greatest importance in control of deflection and whipping of rotating shafts and surging of springs. Its variation with temperature appears to be a controlling factor in fatigue and creep resistance of steel. Other relations undoubtedly will be found as there remains a number of problems to be investigated; for instance, a study of the relation of damping capacity to work hardenability, impact resistance, relief of internal stress, and others.

Effect of the shape of the test piece upon energy needed to deform materials in the single-blow drop test was discussed in a paper by O. W. Ellis, director of metallurgical research, Ontario Research Foundation, Toronto, Ont. Copper and nickel cylinders, frustra and cones of equal height and volume were used in the investigation.

Measures Deformation Energy

From his work, Dr. Ellis developed an equation which applies not merely to cylinders, but to cones and conic frustra of equal volume. It applies, further, to steel and nickel at all temperatures, and to copper, lead, and possibly aluminum at room temperatures. Experiments on cadmium, tin, and brass showed that the equation did not apply to them at room temperature.

The mode of deformation of cylinders, frustra and cones was discussed by Dr. Ellis in the light of etched sections of nickel samples of these various forms. A quantitative study of such etched sections has led to the tentative conclusion that the energy absorbed in the formation of the "ovoidal segment" becomes proportionately greater as the forging temperature is lowered and as the energy of the blow is increased.

Although granting that Dr. Ellis had some definite reason for conducting his experiments in the manner he did, H. H. Ashdown, consulting metallurgist, Pittsburgh, ventured that practical value would have been enhanced had the specimens been contained within a die and made to conform to some definite predetermined shape, as in this manner there may have been less loss of energy.

To show how X-ray diffraction can be used in following the changes in crystal structure when metals and alloys are hot worked, cold worked and heat treated was the purpose of a paper by N. P. Goss, physicist, Cold Metal Process Co., Youngstown, O. The X-ray method of crystal analysis, the author stated, has given a better conception of the structure of matter

entirely from an atomistic point of view as it reveals internal structure which older methods failed to do.

In the investigation of plastic flow and recrystallization of metals and alloys, the aim is to arrive at a better understanding of the forces which bind the atoms in the space lattice of the crystal, and the changes which occur in the crystals when elastically and plastically deformed. The X-ray method does not explain all of the phenomena of the solid state, but it has changed the viewpoint concerning the structure of matter, metals in particular.

Previous to the inception of X-ray methods of crystal analysis it was difficult to explain elasticity, but now it is known that metals are composed of atoms held rigidly in a space lattice, which is essentially an open structure. In such a structure, said Mr. Goss, the atoms can be slightly displaced from their normal positions when stressed elastically and return to their normal positions when the elastic stresses are removed. Orientation and internal structure of the grains in metals and alloys influences the physical properties.

Included in discussion of Mr. Goss' paper was a statement by C. Nusbaum, associate professor of physics, Case School of Applied Science, Cleveland, that X-rays will prove to be just as useful in the study of the earlier stages of plastic flow as they have been in the study of preferred orientation. However, he said, it will be necessary in some cases to very definitely improve the technique of the methods used.

(To be Continued)

Inspection of Equipment Promotes Safe Handling

(Concluded from Page 46)

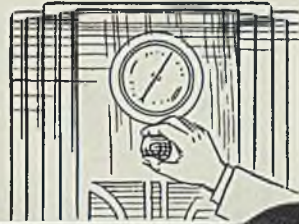
It would be difficult to write an all-inclusive equipment inspection guide for presentation here. The obligation to see that materials handling equipment is maintained in good safe condition should be carried out by the employer or management in every plant, large or small.

In a review of accident histories of ten relatively large plants, all in the steel or metal group, it is found that as high as 38.5 per cent of the frequency in some instances is due to materials handling operations. These are subdivided as follows: Caught or struck by objects; strains while handling; dropping objects; and sharp objects.

The degree of injury ranges from "mashed fingers" to "fatally crushed." The frequency, therefore justifies our taking every precaution possible with regard to equipment condition.

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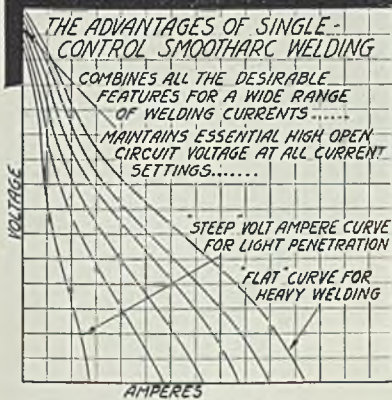
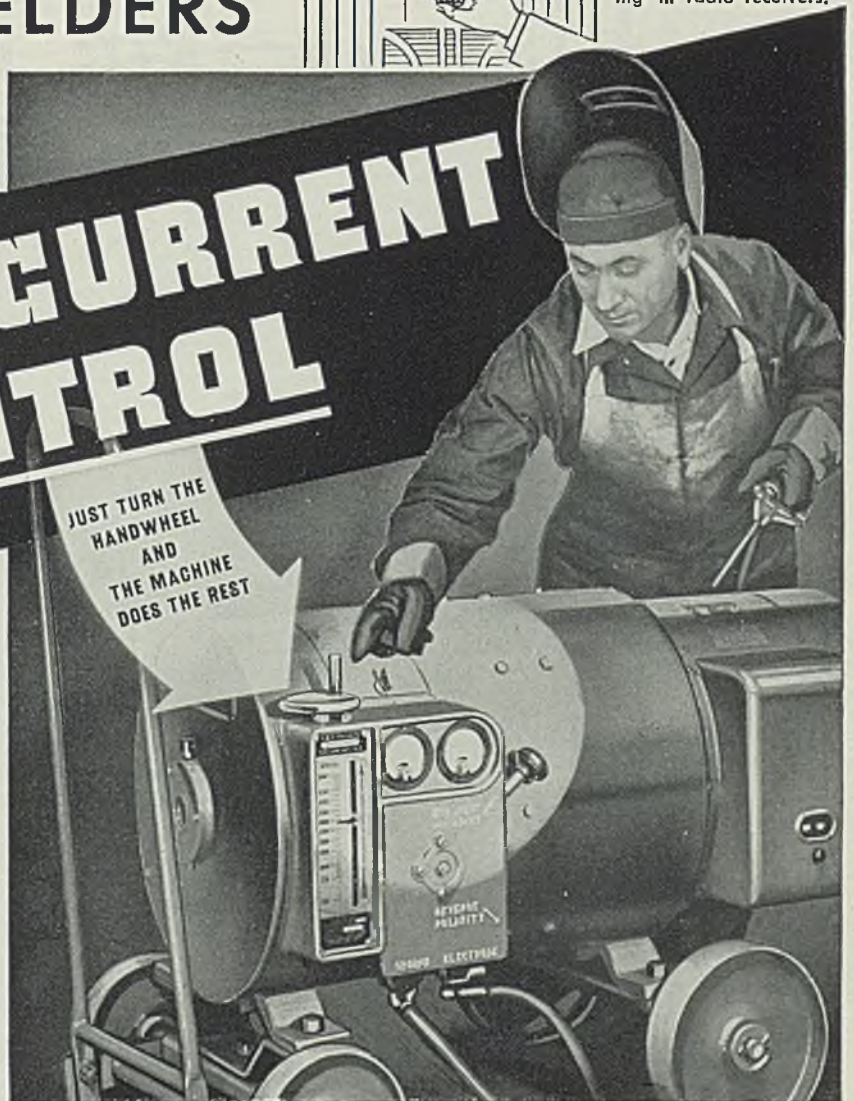
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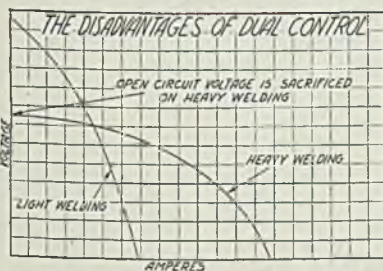
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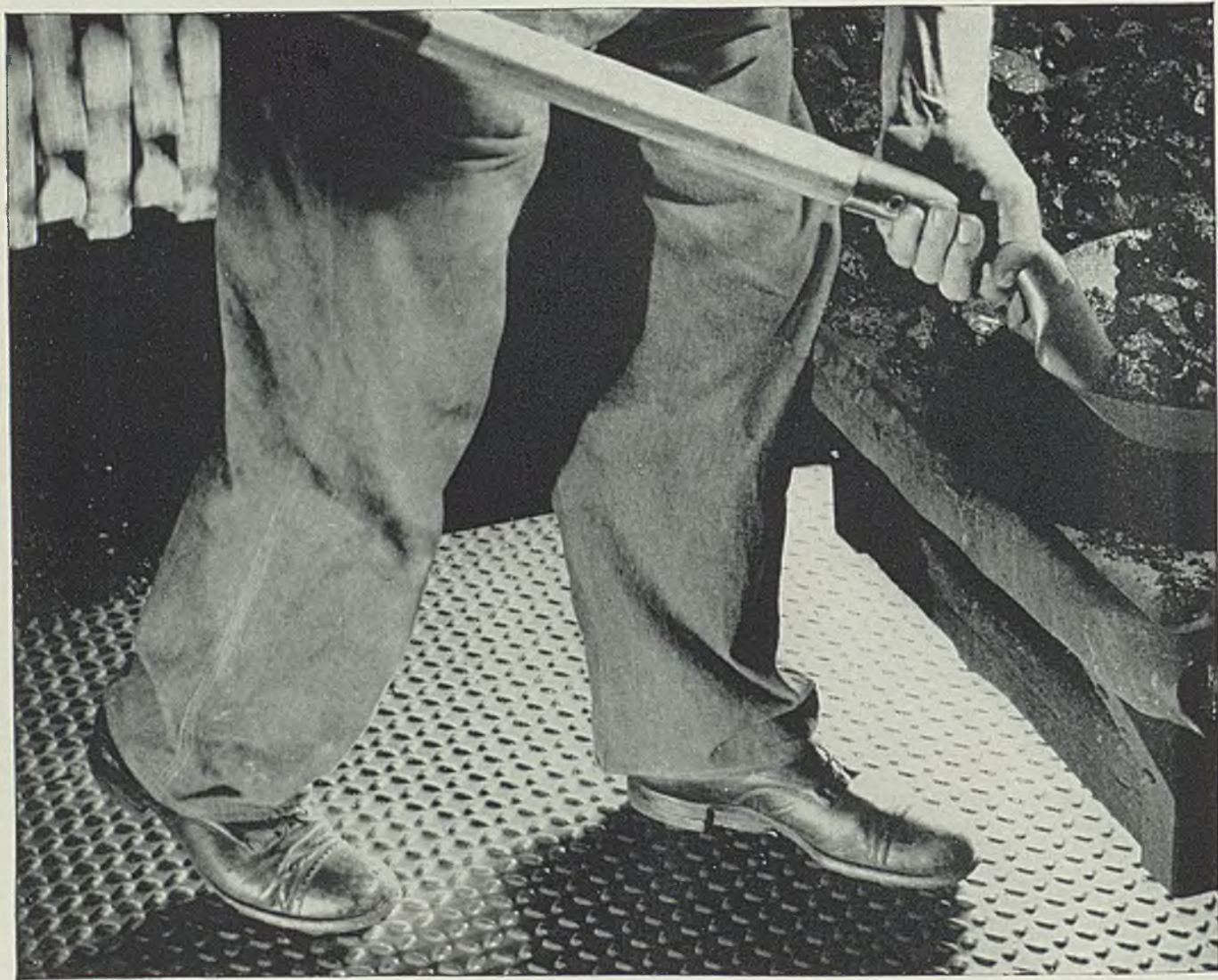
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HOW far the work of the maintenance department and personnel may be specialized depends upon amount and kind of work to be performed, importance of uninterrupted operation, size of the plant, variety of types of equipment and specialized service required on each type. Complicated equipment, automatic or semiautomatic in operation, usually demands the services of a man carefully trained for servicing and adjusting. This man usually is under the control of the department and not a member of the maintenance force.

Where a plant is large enough to warrant, mechanical and electrical maintenance are separated and the duties assigned to different men or crews. With the increasing complexity of electrical control greater knowledge is required of electrical maintenance and service men. Similarly, with the better appreciation of the importance of alignment and lubrication the quality of mechanical maintenance has also improved.

Reduce Overlapping Work

In the maintenance of electrical motors and control the electrical service man checks bearings and lubrication along with electrical servicing, thus not requiring a trip over the same equipment by two men. In some plants all lubrication, even of machines, is taken care of by a member of the mechanical maintenance group. In such cases the machines are provided with special lubricating devices instead of the oil can and open oil hole.

Where more than one man is employed in servicing and inspecting electrical equipment, it is usually best to assign a definite zone or section of the plant to him and make him responsible for the condition

of all equipment therein. Of course, with serious trouble or changing equipment he calls for assistance.

The chief advantages of zone maintenance are fixed assignment and responsibility and greater familiarity with the equipment, operating problems, and the particular causes and indications of trouble in his territory.

In assigning zones care must be taken to see that the service man does not have more equipment than he can cover.

♦ ♦ ♦

Fiddle-String Tension

THE service department of a large motor manufacturer was called on recently because one bearing on a newly installed motor on a fan drive was running hot. The service man connected up his ammeter and found the power consumption to be 54 amperes although the full operating load rating as made when the motor was installed and tested out, was only 47 amperes, indicating an increased load of 7 amperes or about 15 per cent. The motor was not hot which indicated that the trouble lay in the bearing and was not an overload. The hot bearing was next to the pulley.

Inspection showed that the oil ring was turning and carrying oil. When the drive was stopped, however, the serviceman found that the V-belts had been tightened to fiddle-string tightness, thus applying excessive tension or pull on the motor bearing. After relieving the tension by moving the motor back on its base the power consumption again dropped to 47 amperes. This

indicated that the entire increase in load had been due to the excessive tension.

In this case the excessive tension increased power consumption and cost approximately 15 per cent. In addition, the oil would soon have thinned with the higher temperature and been squeezed out of the bearing surface, thus eventually resulting in the extra expense of a bearing failure and interrupted operation.

Tension is necessary on all belted drives. However, much of all bearing trouble is due to excessive tension. In this case the fan operator probably believed that all types of belts have to be tight and did not understand that belts operating in grooves do not require excessive tension.

Where fiddle-string tension is necessary on any belt drive the fault usually is that the belt is undersized for the load. Incidentally the extra tension which increases bearing pressure also increases the power consumption, as indicated in the instance just related.

♦ ♦ ♦

Cost of lubrication is more important and includes more than the cost of lubricant. Additional costs include labor, equipment for application, storage, and the results of neglect or improper lubrication. This last item may be the greatest of all.

♦ ♦ ♦

Because of the low starting load of ball or roller bearings, it is sometimes possible to use a smaller motor when such bearings are installed on the equipment, as for example, where the starting load is the heaviest possible load.

♦ ♦ ♦

Hardened teeth on roller chain sprockets will well repay their extra cost on any installation in severe or continuous service.

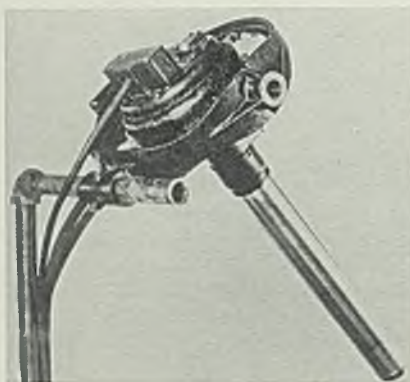
PROGRESS IN STEELMAKING

Temperature of Hot Steel in Motion Is Indicated Automatically

MEASURING the surface temperatures of hot materials instantaneously and indicating or recording automatically on a graphic instrument all variations of temperature during the period that the hot body is viewed, now is being accomplished by an optical pyrometer. The materials may be in motion as in a rolling mill or they may be at rest, as in a processing furnace.

The system consists of three separate units, namely, the sighting unit, the power supply and the indicating and recording instruments. The sighting unit is mounted several feet from the hot object, its tube being aimed directly at the object or the path along which the object moves. The temperature of the hot object causes an electrical reaction which is transmitted to the measuring instruments.

Electrical excitation for the entire system is provided by the power supply unit. The instruments either for indicating or recording the temperature can be mounted in any desired location. These are wired to



Sighting unit which is mounted near target

the sighting unit and measure electrically the variations in temperature of the hot object. Readings are directly in degrees of temperature.

When installed in a hot strip mill the system makes it possible to hold the various slab reheating furnaces at the same temperature inasmuch as the system is so sensitive that

it detects the slightest unevenness in heating during the initial stage of rolling. By the use of the system the best temperature for the removal of scale, cleaning and finishing of a sheet can be determined and maintained. From an analysis of the records the best rolling temperature for different gages, sizes, etc., can be determined, thus enabling exact duplication on subsequent runs. Inasmuch as faulty processing is revealed in the early stages of reduction the number of rejects can be reduced thus minimizing rolling costs.

This system of temperature measurement, known as the Optimatic system, was devised by the Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia.

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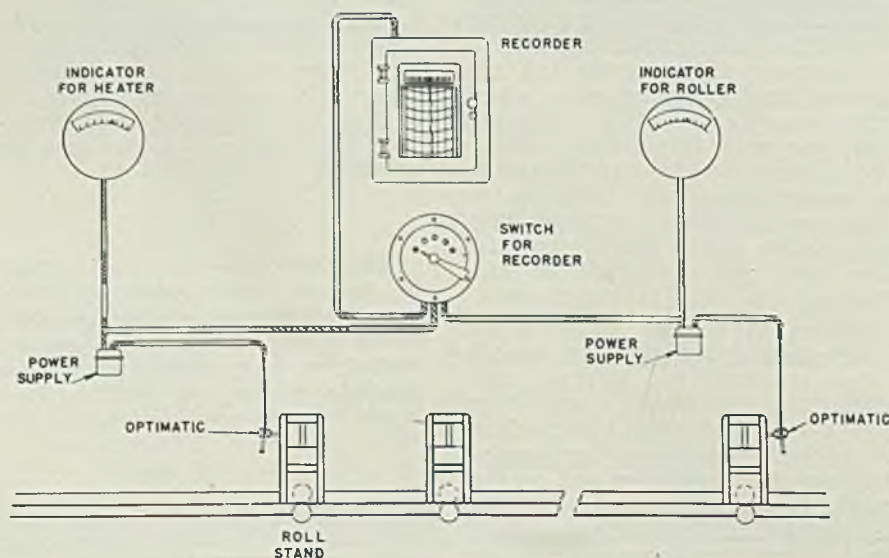
Device Lights Gas Torch

Lighting the preheating flames of a scarfing torch is accomplished instantly by a patented device. Insulated wire leads from the head of the torch to an electrical condenser and a return wire connects the grounded rails upon which the billets are located. Immediately after the trigger valves on the oxyacetylene lines are opened, an electric spark leaps the gap between the blowpipe and billet, thus igniting the flame. Depressing a second trigger starts the oxygen at the proper moment. When the cut is completed the operator loosens his grip at the forward end of the handle which permits all valves to assume a closed position.

♦ ♦ ♦

Increases Life of Linings

Ideal ladle lining practice, according to a refractories engineer serving an Ohio steelworks, involves uniform size brick, medium thin, tight joints and the proper use of such shapes as wedges and arches. As much as 10 per cent increase in the life of ladle linings has been noticed by some operators by the use of high-temperature cement instead of ordinary fireclay for laying the brick. This practice also has been effective in reducing the amount of fireclay type inclusions in steel.



Schematic diagram of system for measuring temperature of steel during reduction

THE

P *roprietor*



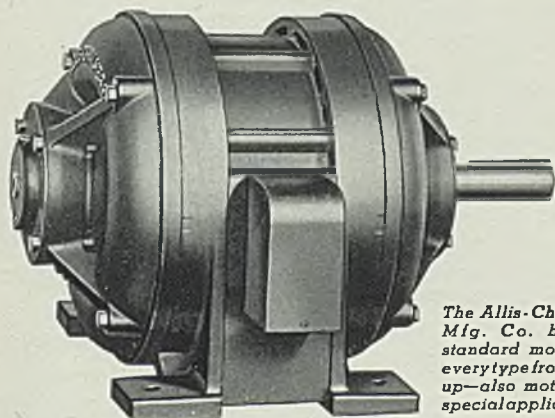
EATS IN ANOTHER RESTAURANT

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M I L W A U K E E W I S C O N S I N

British Steel Men

Discuss Influence

Of Coke on Steel

A NUMBER of important papers were presented and discussed at a meeting of the British Iron and Steel institute, in London, Oct. 29-30. This meeting, which was conducted by the institute's president, Sir Harold Carpenter, was supplementary to the institute's regular autumn meeting, held at Dusseldorf, Germany, Sept. 21-22.

Under the title of "Investigations into the Influence of Coke Quality on Blast-Furnace Operations," W. J. Brooke, H. R. B. Walshaw and A. W. Lee gave the results of their investigations at the Normanby Park Steel Works, Scunthorpe, Lincolnshire. Reference was made to work done in collaboration with the Midland Coke Research committee, and large-scale experiments were described, showing the effect of fine-grinding various South Yorkshire coking slacks.

Coke Investigations Difficult

In discussion, E. C. Evans, Industrial Research council of the British Iron and Steel federation, stated research on coke in blast-furnace operations is extremely difficult. He mentioned having at one time made experiments with good coke and bad coke, having found in the case of the better coke an increase of output of 30 per cent with 11 per cent less consumption. He said in his opinion, the volume of hot-blast blown into the furnace is the most useful indicator in blast-furnace observations. He mentioned after investigations had been carried out for more than ten years, not one test of coke had been found which singly gives a precise idea of the coke's value in blast-furnace operation. He considered, however, the swelling test is an interesting one to use. He added that little is known of the fundamental qualities of coal

that determine its coking qualities, and much more research should be made in that direction.

Frank Bainbridge, Skinninggrove Iron Co., Saltburn-by-the-Sea, Lancashire, referring to the grinding of Durham coal said the finer the coal was ground, the more they found increased quality for coke, particularly from the point of view of density. Replying to the discussion, Mr. Brooke said some coals give better results when they are crushed fine. Referring to a question by Dr. W. H. Hatfield, Brown-Firth Research Laboratories, Sheffield, concerning the statement made by the authors that the influence of coke is traceable in the qualities of the finished steel product, Mr. Bainbridge said that statement does not apply so much to the steel analysis as to the physical characteristics of the steel.

Dr. T. Swinden and G. R. Bolsover, of the United Steel Companies, Sheffield, presented a paper on "Controlled Grain Size in Steel." In this paper the authors gave the results of their investigations on 18 types of steel in which the only variable within practical limits was the grain size. They found fine-grain steel had a better Izod value with a given tensile strength, or, conversely, a somewhat higher tensile strength with a given Izod value, than coarser-grain steel.

Inclusions Affect Grain Size

In discussion Dr. A. L. Norbury, British Cast Iron Research association, stated the investigations of the authors were similar in some respects to those conducted on cast iron in regard to graphite size. He remarked the variations in size were due to some unknown quality, but could probably be traced to non-metallic inclusions. Theory of the

influence of aluminum was losing favor, because aluminum is found both in fine and coarse-grain material. Iron oxide, on the other hand, is found in coarse-grain material, but not in finer grain sizes. He advanced the suggestion that fine-grain steel would contain solid small inclusions, whereas coarse-grain steel would have liquid inclusions, which would coalesce and finally give large inclusions.

W. J. Dawson, Hadfield's, Ltd., Sheffield, referred to the easier machinability of coarse-grain steel. He mentioned the statement made by the authors in which they said the time might come when grain-size control would be specified by the purchaser of steel.

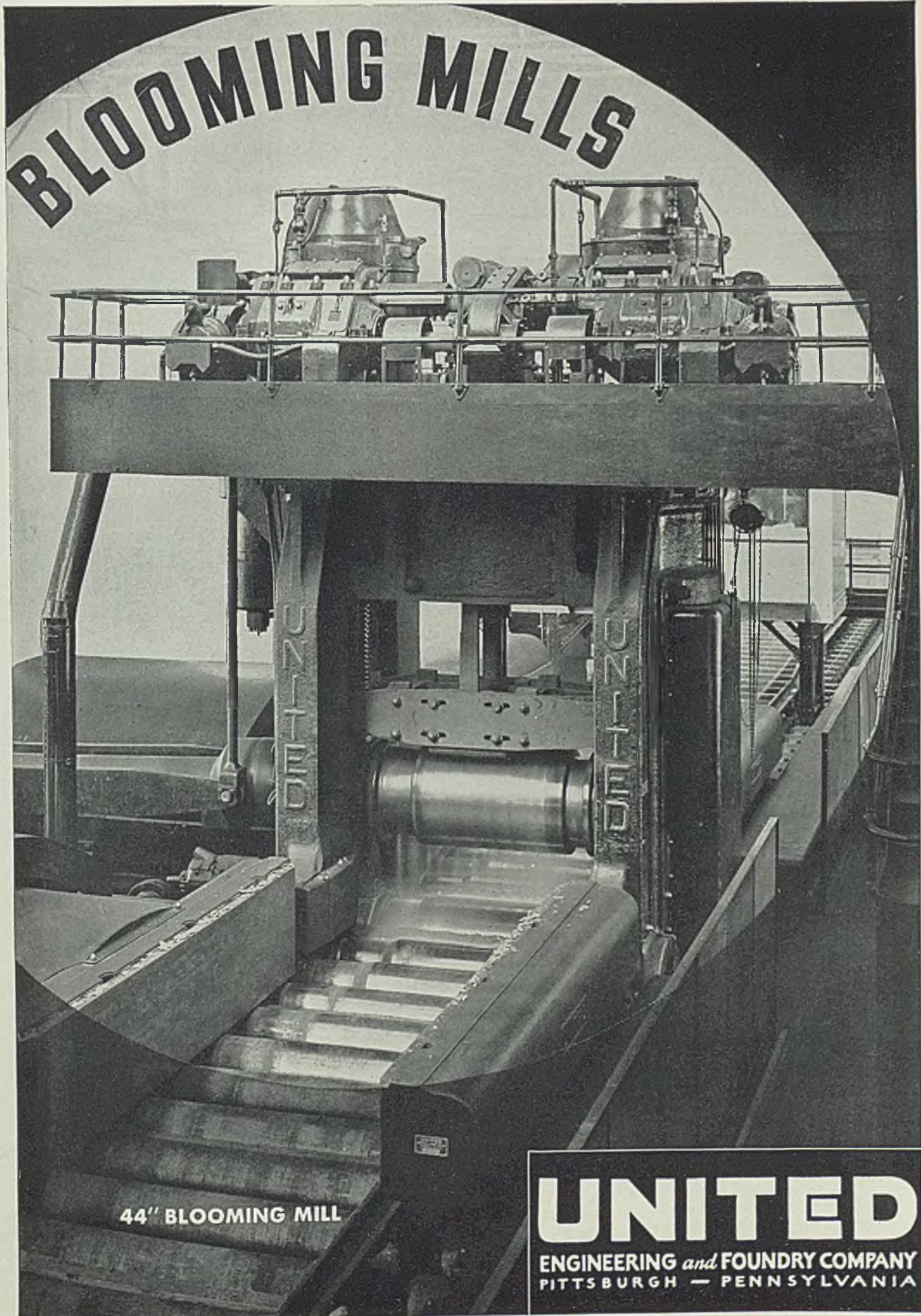
J. H. Whiteley, Consett Iron Co., Durham, referred to the large amount of work done on the subject in the United States. He queried whether the authors would be in a position to make steel of any given grain size at will.

Prof. J. H. Andrew, The University, Sheffield, laid stress on the effects of alumina, either alone or in combination with iron oxide. Dr. Hatfield gave warning against the use of additions of as much as 0.3 per cent aluminum to the steel, because this amount tends to cause excessive pipe in the ingot, with all its dangerous consequences. He also pointed out it would be difficult for the engineer obtaining steel from different sources to discriminate between these different steels of the same general characteristics with regard to the heat-treatment each should receive in relation to its grain size. J. S. G. Primrose, Birmingham, stated if one gets to very small grain size, there is a danger of falling into new difficulties. With regard to the difficulties of machining, he said it is comparatively easy to heat-treat a small grain size steel and give it machinability, and then normalize it back and again obtain small grain size.

Aluminum for Deoxidizing

Replying to the discussion, Dr. Swinden stated the authors do not definitely suggest that grain size should be included in specifications, but give it as an alternative to secure better-quality steels without resorting to alloy steels. He claimed normally one could control the grain size of steel within two sizes. Referring to the question of aluminum additions, the problem is one of deoxidizing, and aluminum is used as being the most available agent.

T. P. Colclough, chief engineer, H. A. Brassert & Co., London, discussed "The Constitution of Blast Furnace Slags in Relation to the Manufacture of Pig Iron," which deals with the constitution of blast furnace slags, the changes in con-

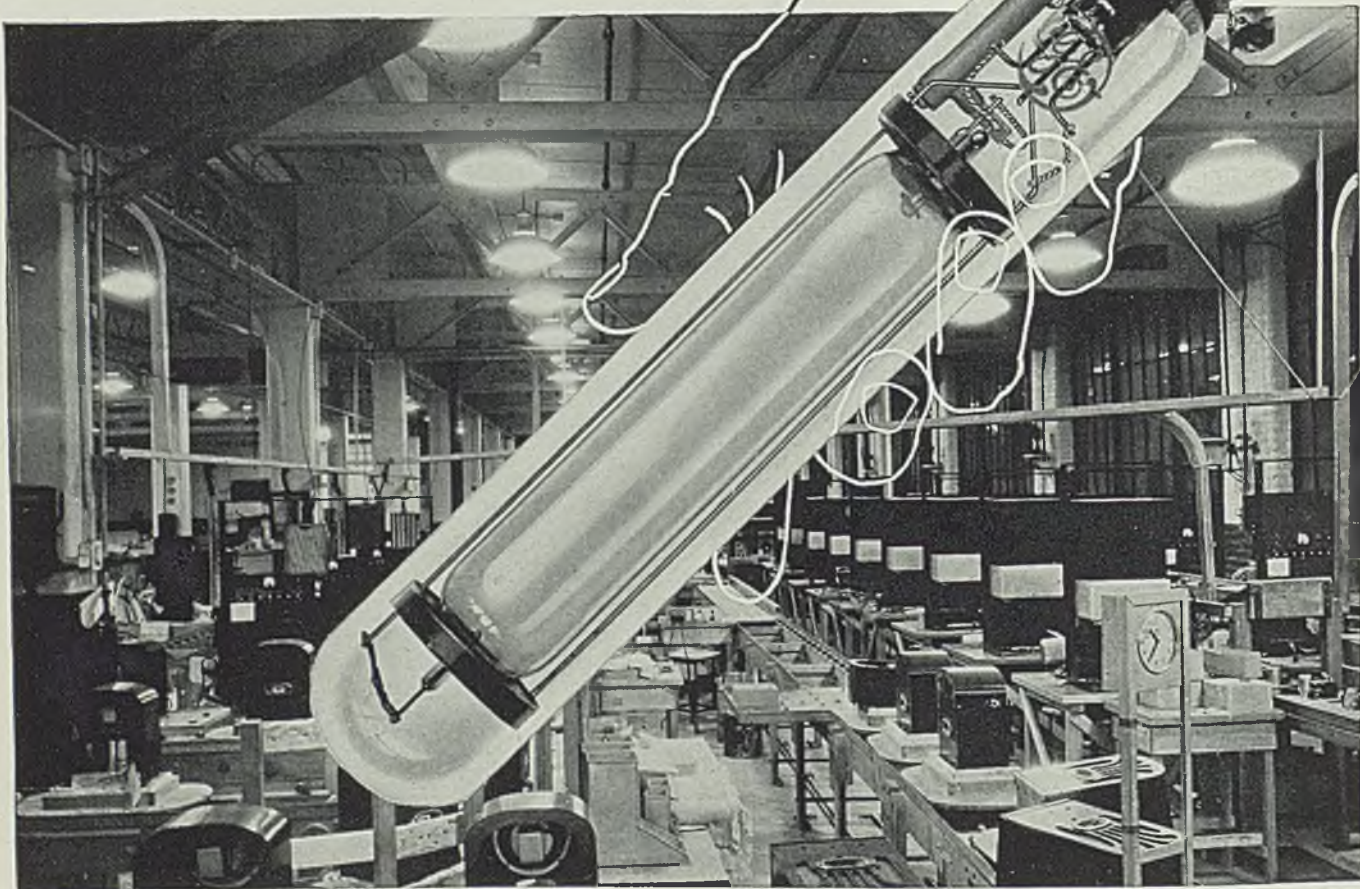


BLOOMING MILLS

44" BLOOMING MILL

UNITED
ENGINEERING *and* FOUNDRY COMPANY
PITTSBURGH — PENNSYLVANIA

Throw more light on
production economy in
this most efficient way



A typical installation of General Electric Mercury Lamps in a well-known machine shop.

Throughout industry higher levels of illumination are being obtained, at a lower cost per foot-candle, by means of General Electric Mercury Lamps. These modern, efficient sources of light are promoting more economical, more efficient production everywhere. With the higher levels of illumination, rejects are minimized . . . there is no waste of energy in the mere physical act of "seeing" . . . and eye-strain is reduced materially. As a result, end-of-

shift fatigue is banished and workmen can produce a more uniform, accurately finished product at lower cost.

General Electric Mercury Lamps are available in two sizes—400 watts and 250 watts. Both are adapted for use on 115- or 230-volt lines, and both have a rated life of 2,000 hours. These lamps have an efficiency 50 to 100% higher than that of other light sources.

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Order your auxiliary devices which were designed especially for this lamp from the General Electric Vapor Lamp Company.

GENERAL  ELECTRIC

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885 Adams Street, Hoboken, N. J.

Incandescent Lamp Department
Nela Park, Cleveland, Ohio

stitution and properties of the slag arising from variations of the alumina content and the basicity ratio, and offers an explanation for the difficulties encountered in the smelting of certain British iron ores, particularly those which carry a relatively high ratio of alumina to silica, when smelted in accordance with the rules of burdening accepted in common practice.

Economy Is Effected

In the discussion, R. A. Hacking, Rotherham, Yorkshire, referred to some work which he had previously done with the author and where examination of the slag of a blast furnace was conducted with a view to arriving at a beneficial change in the source of raw materials, especially as regards its alumina and silica contents. Following investigations made, and after having made certain modifications in the supply of raw materials, an economy of several shillings per ton was effected.

The morning session ended with the presentation by Dr. Hatfield, and Dr. J. C. Hudson, of Birmingham, of the Fourth Report of the Corrosion Committee, joint committee of the Iron and Steel Institute and the British Iron and Steel federation. This report is divided into seven sections: Sec. A is introductory; Sec. B gives the conclusions that may be drawn so far from the committee's work; Sec. C describes the quantitative results to date of the committee's field tests on atmospheric corrosion; Sec. D describes the progress of the committee's investigations into marine corrosion; Sec. E deals with the work carried out by, or submitted to, the Laboratory Research sub-committee; Sec. F gives the constitution and future program of the recently-formed sub-committee on protective coatings, and Sec. G deals with other matters relating to corrosion considered by the committee.

Reports on Cast Iron

Dr. A. L. Norbury and E. Morgan, of the British Cast Iron Research association, Birmingham, described research on "The Effect of Non-Metallic Inclusions on the Graphite Size of Gray Cast Iron." The discussion was opened by Dr. C. H. Desch, of the National Physical Laboratory, Teddington, who, referring to the practical aspect of the work done by the British Cast Iron Research association, said this work had led to the practical control of graphite size. Dr. Marie L. V. Gayler queried whether there would be fine structure if the materials were pure and contained no inclusions at all, in which case the theory put forward by the authors with regard to the effects of treatment with titanium and carbon dioxide

would not always be true. J. H. Whiteley suggested the inclusions referred to by the authors and shown in the micrographs were constituted by carbides.

E. W. Colbeck, Research Department, I.C.I. (Alkali), Ltd., Northwich, Cheshire, stated the practical aspects of the paper were very important, but he pointed out the authors had found they could refine the graphite in the crucible, and had shown such a refined structure might be very attractive commercially, but such a process could not be followed in the normal way of melting cast iron in the cupola. He also was of the opinion that the inclusions shown were not titanates, but carbides. Dr. Swinden, one of the authors of the paper on "Controlled Grain Size in Steel," stated he was conducting experiments on controlling the size of graphite in cast iron, particularly as regards the making of ingot molds. Dr. Hatfield stressed the importance of superheating.

Inclusions Are Isolated

Mr. Colbeck, in collaboration with S. W. Craven and W. Murray, I.C.I. (Alkali), Ltd., contributed a paper on "The Determination of Non-Metallic Inclusions in Steel and Iron." This paper contains a detailed description of the use of chlorine for isolating such inclusions.

Dr. Desch mentioned some years ago he had used the chlorine method and had rejected it because even at low temperatures—around 350 degrees Cent.—this method caused secondary reactions to interfere. He then went over to the iodine method, which has now been improved, and he said for the simpler type of steel he was satisfied the iodine method is good, and he also expressed the opinion it would eventually be good for other types of steel. T. E. Rooney, National Physical Laboratory, Teddington, stated he had been successful in decomposing sulphides in the iodine method by using higher temperatures, but he was of the opinion that molybdenum carbide is not entirely soluble. Referring to remarks made concerning the negative results of X-ray examinations, he said such negative results are not necessarily conclusive. He mentioned in more recent work he and Stapleton had improved upon the chlorine and iodine methods. Dr. Swinden stated he attached great importance to the iron ferrous oxide and the manganese oxide fracture, and he said if the chlorine method does not show that fracture, it loses a lot of its interest in favor of the hydrogen reduction method.

A paper on "The Roll Problem in Backed-Up Mills for Cold Reduction" was contributed by Geo. A. V.

Russell and S. S. Smith, I.C.I. (Metals), Ltd., Witton, Birmingham. This paper is a record of experience with the working and backing rolls in a large installation of cold-rolling mills. The authors make tentative suggestions for improving backed-up roll performance.

Objections to High-Speed Rolls

Referring to the mention made by the authors of the use of high-speed steel rolls, Dr. Hatfield said the authors apparently did not realize the difficulties involved. Referring to the troubles that occur particularly with four-high mills, he pointed out the steel must be in the hardest possible condition, which means residual stresses—therefore, the stresses imposed on the rolls must be within these residual stresses. W. E. Bardgett, Sheffield, questioned the merits of heat-treating rolls during several weeks. He mentioned his firm had adopted a carbon-chromium composition of steel, which had proved satisfactory. He said the most common type of failure in strip mills came from small isolated deep cracks in the direction of the length of the barrel. H. C. Dawson, pointed out that some large hollow rolls proved very satisfactory in service, and he presented a plea for the standardization of rolling mill design.

A report was prepared by a joint Alloy Steels Research committee of the Iron and Steel Institute and the British Iron and Steel Federation, and it contains 13 sections: Sec. I is introductory; In Sec. II, Dr. Hatfield, chairman of the committee, deals with research as regards alloy steels; In Sec. III, the atomic arrangements in alloys are discussed in the form of an account of a series of three lectures delivered by Prof. W. L. Bragg at the Royal Institution, this account being given by L. Rotherham; Sec. IV deals with the present position as regards the iron-carbon-chromium system and was prepared by J. H. G. Monypenny; Secs. V and VI, by Dr. C. H. Desch, deal with the iron-nickel system and the alloys of iron and sulphur.

Research Is Reported

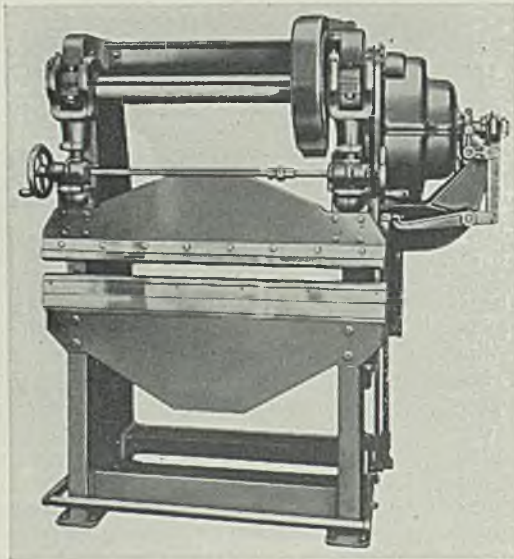
Sec. VII is a paper by Prof. J. H. Andrew and C. G. Nicholson on the iron-cobalt system; In Sec. VIII, Dr. W. R. Maddocks and Dr. G. E. Clausen deal with alloys of iron-copper-carbon-cobalt; Sec. IX is the first report of the Thermal Treatment Sub-Committee, presented by P. B. Henshaw; Sec. X covers overheating and burning in alloy steels following the investigations of G. Wesley Austin; Sec. XI is an account of the researches which are being carried out at Leeds University, under Professor Cobb's direction, on the scaling of steels in furnace atmospheres.

(Please turn to Page 72)

NEW EQUIPMENT

Press Brake—

Whitney Metal Tool Co., Rockford, Ill., has recently placed on the market a new power press brake known as the Whitney-Jensen No. 47 4-foot press brake. Machine has a capacity of making a right angle



Whitney-Jensen No. 47 power press brake, capacity of which is a right angle bend in 14 gage mild steel

bend in 14-gage mild steel 4 feet in length. Housings and bed plate are fabricated of plate steel reinforced with truss rods. Each housing consists of two ½-inch plates and the reinforcing bars are 1 ¾-inch square truss rods. Ram is a single plate 2 inches thick and 12 inches wide. Assemblies are normalized to eliminate strains set up in welding. The machine is double back geared, powered with a 3-horsepower motor which is mounted, together with flywheel, clutch and all control linkages, on the right hand upright. Overall length of die surface is 50 inches and the clear distance between housings is 37 inches. Stroke speed can be adjusted from 20 to 54 strokes per minute. Flywheel is 20 inches in diameter, weighs 180

pounds and has a maximum speed of 1100 revolutions per minute.

♦ ♦ ♦

Horizontal Compressor—

Worthington Pump & Machinery Corp., Harrison, N. J., announces

compression cylinder requires only one packing box which is subjected to moderate pressures, according to the company. Leakage is reduced to a negligible amount, it is claimed, which is desirable in handling explosive or valuable gases. Double row tapered roller bearings, automatic self-oiling frames with oiltight covers, Worthington feather and ring plate valves and efficient intercooling between stages are features of the new line of compressors. Choice of steam or motor drive is offered on all models. Compressors are suitable for high air pressure for any purpose, and for the compression of oxygen, hydrogen, helium and other special gases, as well as refinery gas or straight natural gas.

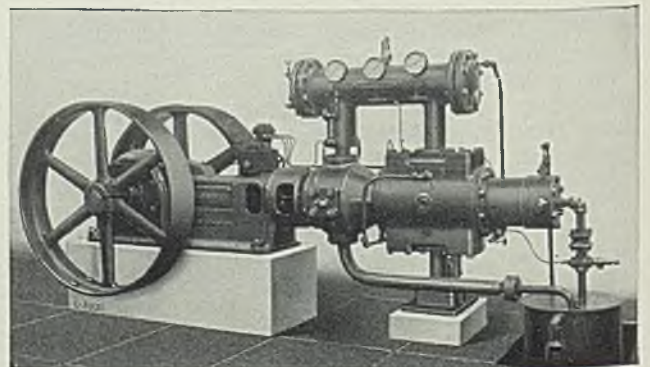
♦ ♦ ♦

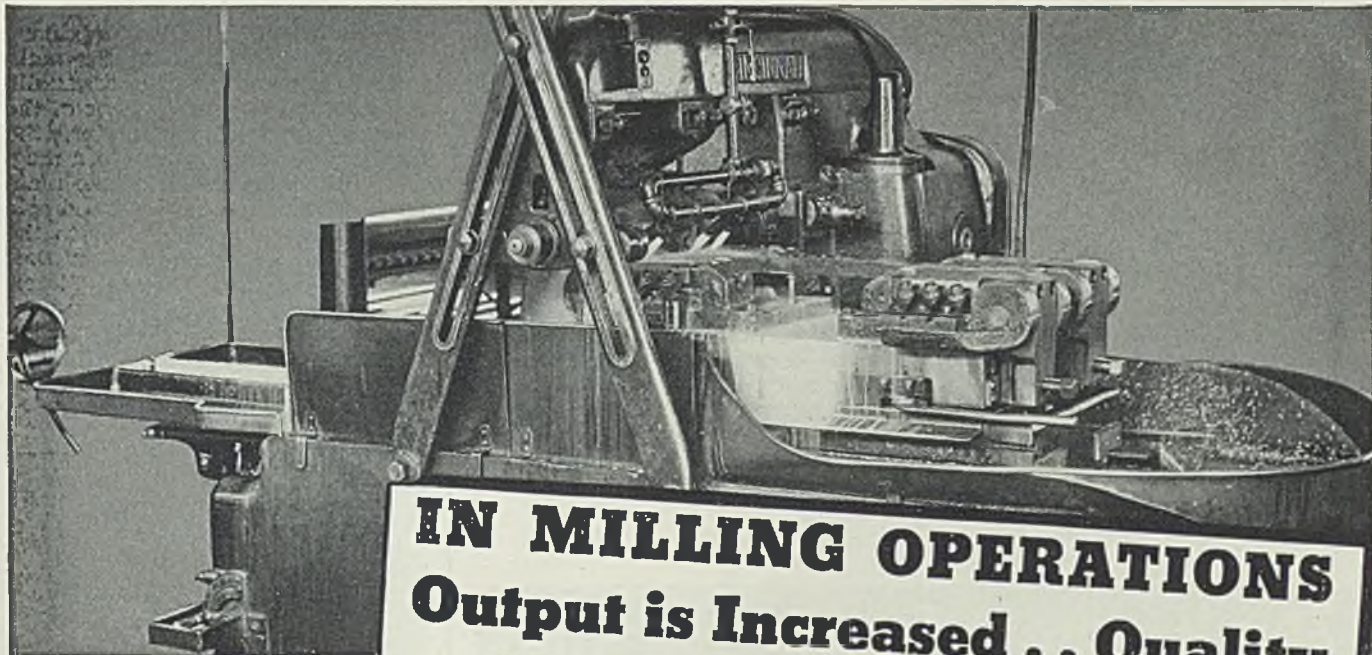
Antifreeze System—

Sullivan Machinery Co., Michigan City, Ind., announces recent improvements in its Tannergas and Tanner tank air line antifreeze systems which eliminate freezing of air lines and keep drills, hoists, brakes, tools and the like operating in temperatures to 70 degrees below zero. By means of by-passed air, the liquid Tannergas in the tank is agitated and throws off a dry gas which enters the line and treats the moisture in the compressed air regardless of how far it is carried. The material is nonex-

an improved line of single horizontal three-stage compressors for pressures from 750 to 2500 pounds. Compressors are suitable for use with higher pressures because the

Single horizontal three-stage compressor designed by Worthington for handling valuable or explosive gases





**IN MILLING OPERATIONS
Output is Increased .. Quality
Improved with SUNOCO**

Operation: Milling Crankshaft Counterweights.
Material: Cold Drawn Steel.
Spindle Speed: 65 R. P. M.
Feed: 8" per minute.
Cutting Lubricant: 1 part Sunoco to 20 parts water.

Courtesy of Cincinnati Milling Machine Co.

Operation: Surface Milling.
Material: Machining Steel.
Spindle Speed: 108 R. P. M.
Feed: 11" per minute.
Cutting Lubricant: 1 part Sunoco to 25 parts water.

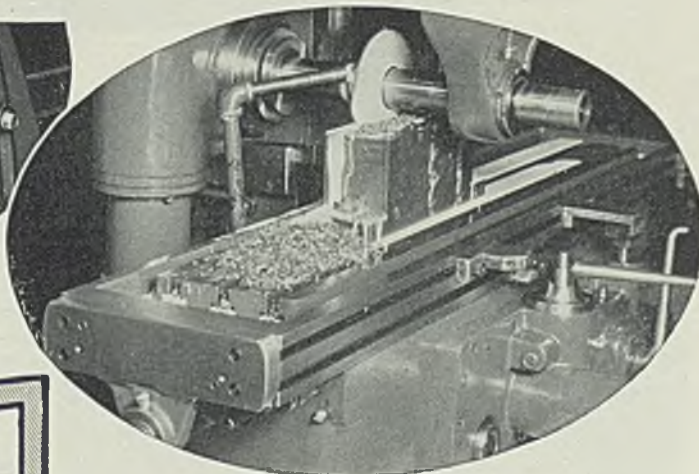
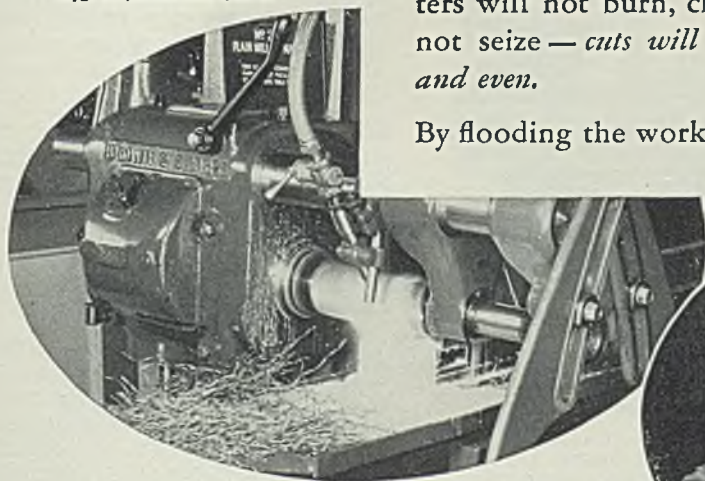
Courtesy of Brown & Sharpe Mfg. Co., Providence, R. I.

THE lubricating and heat absorbing qualities of Sunoco permit faster milling cutter speed with the feed per minute unchanged. And with that increased speed, cutters will not burn, chips will not seize — *cuts will be clean and even.*

By flooding the work and the

cutter with Sunoco, the grinding action of chips on the cutting edges and finished surfaces is prevented.

Sunoco performance, under actual operating conditions in your plant, will convince you that it increases output and improves quality in the milling operations.



SUNOCO
EMULSIFYING
CUTTING OIL

Operation: Slot in Steel Test Block. **Material:** S.A.E. 1035.
Spindle Speed: 60 R. P. M. **Cutter:** 6" Diameter.
Cutting Lubricant: 1 part Sunoco to 20 parts water.

Courtesy of The Product Machine Co., Bridgeport, Conn.

SUN OIL COMPANY, PHILADELPHIA, PA., U. S. A.

Subsidiary Companies: Sun Oil Company, Ltd., Montreal, Canada
British Sun Oil Company, Ltd., London, England

plosive and odorless. Cost of treating 100 cubic feet of free air per minute is approximately 7 cents per 8-hour work day, according to the company.

◆ ◆ ◆
Welding Machine—

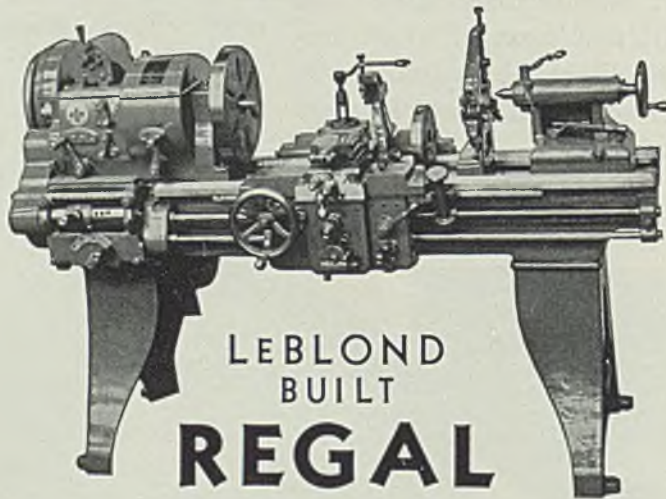
Harnischfeger Corp., Milwaukee, announces a new line of Smootharc welders featuring simplified design in outward appearance and in operation, with single current control, self-excitation and internal stabilization. The new welders are built in both horizontal and vertical type

for portable or stationary mounting. Vertical units are available in 75, 100 and 150-ampere sizes, while horizontal units, built with a minimum of projecting parts for easy portability, are made in 200, 300, 400 and 600-ampere sizes. All sizes of the new welders are provided with single current control. Through a micrometer screw the brushes are shifted, giving an infinite number of current settings. Open circuit voltage is maintained at a high value at all current settings. Voltage regulation is automatic and requires only a turn of the handle to adjust the welding

current. Self-excitation is accomplished through a set of auxiliary brushes placed ahead of the main brushes and connected to an auxiliary shunt winding. By means of the specially designed generator, the auxiliary brushes operate in a magnetic field independent of the main field. Through the use of a simple interpole winding extending to the main shoes in such a manner that it serves the dual function of interpole winding, all new welders are internally stabilized. Generator instruments are concentrated in a single control panel built into the

The Handiest Tool *in the Shop* for Special and Production Jobs

LEBLOND Regal Lathes in 10, 12, 14, 16 and 18 inch sizes, are proving their time, labor and money saving qualities in hundreds of shops for special jobs and as supplemental production equipment. Rugged, durable, sturdy, LeBlond Regals deliver continuous trouble-free service under heavy duty requirements.

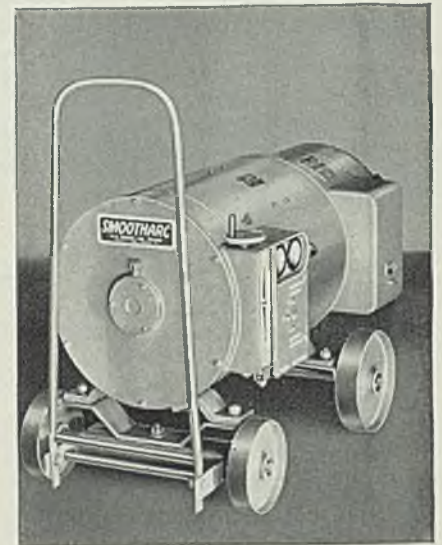


is a lathe worthy to bear the LeBlond name. Built to the same high standards of quality and performance, subjected to rigid inspection and accuracy tests, Regal Lathes are the outstanding machine tool value in the industry. Every shop can profitably use several Regals.

FREE CATALOGUE. Send today for copy of illustrated Regal Catalogue, and information on LeBlond heavy duty lathes.



The R. K. LeBLOND
MACHINE TOOL CO., CINCINNATI, O.
 20 North Wacker Drive, Chicago 103 Lafayette St., New York
HALF CENTURY OF SERVICE TO INDUSTRY



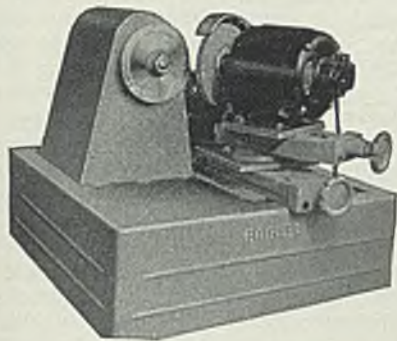
Harnischfeger Smootharc welding machine available in horizontal portable models as shown or in vertical models for stationary mounting

side of the generator frame. The alternating current motor starting box is built into the side of the motor housing. All steel parts are annealed.

◆ ◆ ◆
Circular Knife Grinder—

Samuel C. Rogers & Co., Buffalo, N. Y., announces a new circular knife grinder for single or double bevel knives or disks, bench type or floor type. Model CC1 has capacity up to knives of 14-inch diameter, while model CC2 takes knives up to 20-inch diameter. Machines are of cabinet base construction, furnished for motor drive only. Knives are removed by separate motor drive through V-belt connection, giving positive knife revolution throughout the grinding operation. Knife is mounted on an adjustable arbor with provision for solid circular knives or knives made in two sections. For thin knives of small diameter suitable flanges are provided for supporting the knife. Grinding wheel is 6 x 1/2 inches, and is mounted directly on the arbor of a

ball bearing motor with provision for eliminating end thrust. Entire assembly has a double adjustable slide mounting to afford any style of grinding desired, single bevel or double bevel. Graduated index is provided for setting any degree of bevel. Grinding head operates in



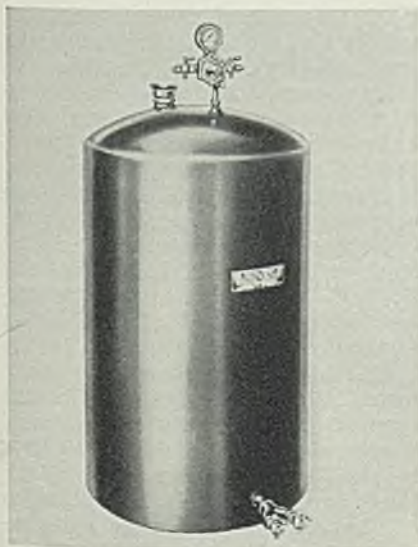
Rogers circular knife grinder for single or double bevel knives or disks

and out by hand, through a screw hand wheel. Adjustable steel gibs take up wear.

◆ ◆ ◆

Pressure Tank—

Binks Mfg. Co., 3114 Carroll avenue, Chicago, announces a new line of special low-priced pressure tanks, type TS. Tanks are designed for handling materials such as thinners, cleaner, oil and other non-pigment liquids. They can be used for any type material which does not require a tank with cover removable for cleaning. Tanks are constructed for pressures up to a maximum of 100 pounds. A 2-inch filling inlet is provided in the head, and a 1-inch outlet in the bottom supplied



Binks low-cost pressure tank for handling non-pigment liquids

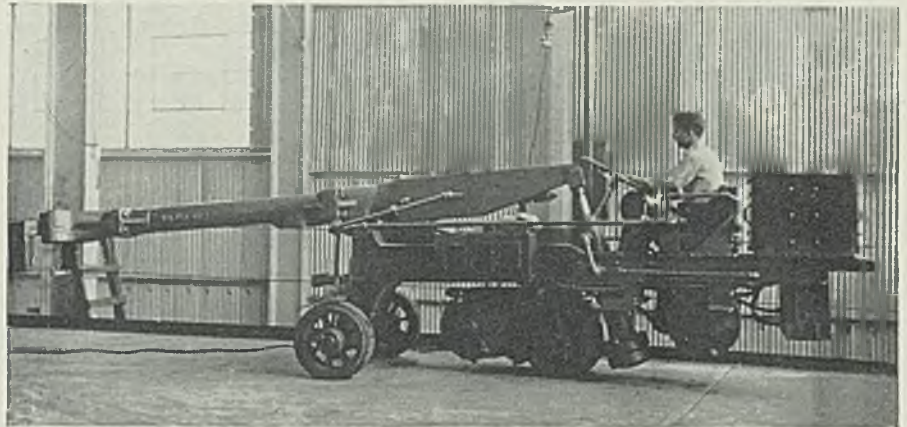
with Y-connection and two 3/8-inch cocks for material hose connections. Each tank is equipped with air pressure regulator, gage, safety pop valve, air release valve, inlet and outlet cocks. This regulates and indicates air pressure applied to materials tank and bypasses air to the spray gun. Tanks are offered in 15, 30, 60 and 100-gallon sizes.

◆ ◆ ◆

Two-Filament Lamp—

Double-Life Lamp Co., Hoboken, N. J., announces a new two-filament

lamp, designed for use in locations where the sockets are not easily accessible, or other uses where extra lamp life is required. Similar in construction to ordinary lamps, the new product contains two filaments inside the glass chamber, with an automatic switch which goes into action when the first filament burns out. Action of the switch brings into play the auxiliary filament automatically on the failure of the first. According to the claims of the builder, the new product can be marketed at the same cost as conventional type lamps.



BROSIUS AUTO FLOOR CHARGING MACHINES

(Patented in the United States and Foreign Countries)

These machines are self contained and require no tracks or runways. Their movement is not restricted to any definite path and they operate in congested areas as they can be turned on their own wheel base.

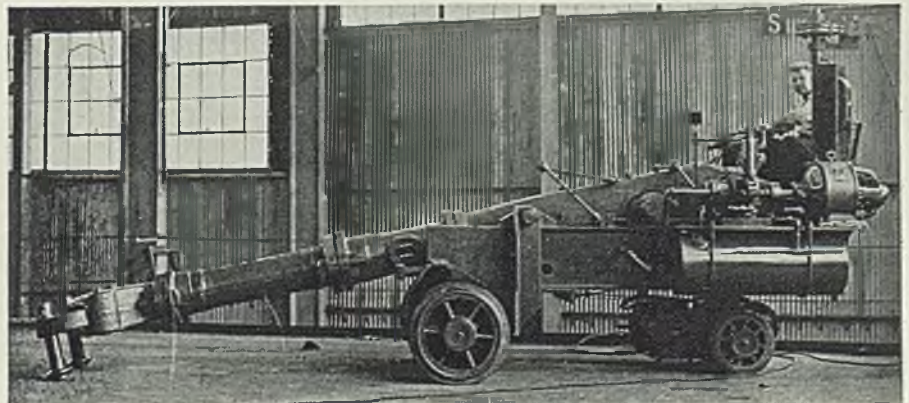
The machine shown above is handling 8" x 8" billets, weighing 2000 pounds and the one below is handling 6000-lb. blooms in and out of a heating furnace and delivering them to steam hammers.

Brosius Auto Floor Chargers are built in capacities of from 1 to 6 tons for serving heating furnaces, hammers, presses, mill tables, etc., and for handling charging boxes for serving open hearths, etc.

EDGAR E. BROSIUS INC.

ENGINEERS and MANUFACTURERS
PITTSBURGH SHARPSBURG BRANCH PA.

European Distributor: Dango & Dienenthal, Siegen, Westphalia, Germany



Refinish Rebuilt Machines To Make Them Attractive

(Concluded from Page 52)

is then applied by brush. The filler is allowed to dry for about 12 hours after which it is sanded smooth by hand with suitable grades of sand and emery paper. Methods of application and sanding are shown in illustrations on pages 48 and 52.

Filled and sanded parts are then given a "sealer coat" of shellac,

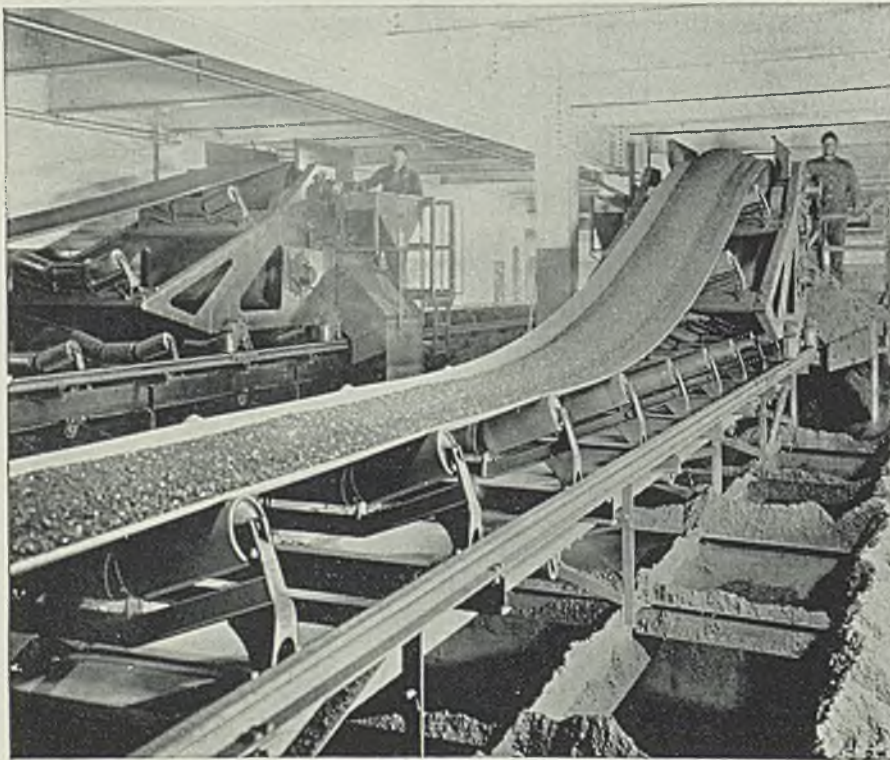
after which they are ready for the finishing coats of paint. Standard machine paint, which is a high grade varnish enamel, is used in most cases. The usual color is standard machine gray but the customer may specify his own color if desired. The use of synthetics on machine tools is not general because of their relative sensitivity to oil, grease and similar substances.

A portable spray machine is used to apply the finishing coats. The bright parts, which have a thin

film of oil on them, are wiped free from any paint which might spatter and the machine is finished. The bright parts are then oiled with a light oil to keep them free from rust and corrosion.

If the finished machine is to be stored in a warehouse it requires considerable care to keep it from deteriorating through rust and corrosion. A combination of light oils has been developed which is applied at regular intervals during the storage period. In warehouses subject to quick temperature changes it was found that the metal surfaces will "sweat" even under the oil, and frequent inspections are made to make sure sufficient protection has been afforded. When the machines are to be shipped the bright parts are thoroughly coated with a special protective grease before crating. All these precautions insure the purchaser will receive the machine in good condition and the good reputation of the dealer will be maintained.

Efficient Coal Handling by LINK-BELT



LINK-BELT EQUIPMENT FOR THE POWER PLANT INCLUDES:

Conveyors of all types, such as belt, bucket screw, flight, drag chain apron, etc.
Bucket carriers and elevators
Skip hoists
Feeders of all types
Weigh larries
Locomotive and crawler type cranes
Coal crushers
Water intake screens
Rotary railroad car dumpers
Underfeed screw type stokers

● This modern belt conveyor system, which is used at a large power station for handling and distributing coal to bins, represents the "last word" in low-cost, high-efficiency conveying. Each conveyor has a capacity of 325 long-tons per hour.

Link-Belt anti-friction idlers provide a low-maintenance-cost, practically frictionless road bed for the belt, which, with the Link-Belt self-propelling >TANK< type tripper, assures long belt life and dependable conveyor service.

If you have a handling problem, put its solution up to experienced Link-Belt engineers. We build the complete range of conveying machinery. No task is too small or too large to interest us. Address Link-Belt Company, Chicago, Philadelphia, Indianapolis, Atlanta, San Francisco, Toronto, or any of our offices, located in principal cities.

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5772-A

Report of British Iron and Steel Institute Meeting

(Concluded from Page 67)

pheres; Sec. XII contains a paper by Prof. J. H. Andrew and D. Swarup on "The Influence of Phosphorus on the Tensile and Shock-Resisting Properties of Certain Alloy Steels," and in Sec. XIII abstracts are given of three papers, provided under the aegis of the Committee for the Chemical Engineering congress of the World Power congress, 1936, dealing with the subject of steel and its application in the chemical and allied industries.

At the first joint meeting of the Iron and Steel Institute and the British Iron and Steel Federation, was presented the second report of the Steel Castings Research committee. The report is divided into six sections: Sec. I is introductory; Sec. II, by Dr. R. H. Greaves, of the Research department, Woolwich, deals with the properties of steel which affect the quality of steel castings; Sec. III, by Prof. Andrew, R. T. Percival and G. T. C. Bottomley, covers the subject of the fluidity of iron-carbon and other iron alloys; Sec. IV, by H. F. Hall, of the Research department, Woolwich, deals with the strength and ductility of cast steel during cooling from the liquid state in sand molds; Sec. V, by W. J. Rees, covers the work and program of the Molding Materials sub-committee, and Section VI, by V. E. Pullin, deals with the present position of radiological examination of steel castings.

See our Exhibit at the National Association of Power and Mechanical Engineering, Grand Central Palace, New York, Nov. 30 to Dec. 5

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

Core Oils—Swan-Finch Oil Corp., New York. Folder on Saeco core oil for core room and foundry.

Pneumatic Products—C. A. Norgren Co. Inc., Denver. Catalog No. 200, illustrating the company's pneumatic products, with prices.

Pipe Fittings—Delta-Star Electric Co., 2400 Fulton street, Chicago. Price list No. 70-1, covering its complete line of "Uniclamp" pipe fittings.

Tool Steel—Edgar Allen & Co. Ltd., Imperial Steel Works, Sheffield, 9, England. Booklet on the company's oil-hardening tool steel, with many illustrations.

Materials Handling Equipment—Gifford-Wood Co., Hudson, N. Y. Catalog containing besides a detailed description of equipment, many tables and drawings.

Drill Rods—Pittsburgh Tool Steel Wire Co., Monaca, Pa. Catalog No. 3, describing the merits, type and properties of cold-drawn steel, including various designs and uses.

Accuro Thermometer—Instrument Service Co. Inc., 310 Twelfth street, Hoboken, N. J. Catalog giving prices, sizes and descriptions of accurate meters for reading temperatures.

Processing Kettles—Patterson Foundry & Machine Co., East Liverpool, O. Catalog on processing kettles as used for the manufacture of synthetic resins and varnish and in the chemical and food industries.

Oven Thermometer—Cooper Oven Thermometer Co., Pequabuck, Conn. Catalog No. 2, describing complete line of thermostatic dial thermometers; includes a brief sketch of the high lights in a half-century of thermometer making.

Centrifugal Pump—Worthington Pump & Machinery Corp., Harrison, N. J. Bulletin No. W-313-B1, describing the improved mixflo centrifugal pump, in sizes from 12 to 34 inches, delivering from 1000 to 115,000 gallons per minute at heads from 5 to 50 feet.

Synchronous Motors—Allis-Chalmers Mfg. Co., Milwaukee. Bulletin No. 1154A, covering construction and numerous uses of modern coupled and engine-type synchronous motors with torque characteristics suitable for practically any drive, 50 horsepower or over.

Sprayed Molten Metal—Condenser Service & Engineering Co., 310 Twelfth street, Hoboken, N. J. Book-

let explains how by spraying of molten metals, a great variety of metals can be applied to metal and other surfaces for the purpose of resisting corrosion, increasing size,

replacing material removed by wear, correcting surface defects, imparting desired chemical, mechanical or electrical properties or improving appearance.

Bailey... EQUIPMENT

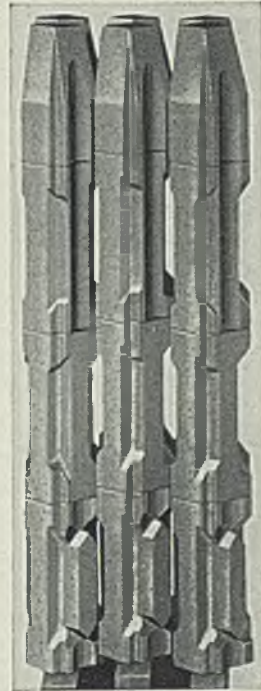
WMB Co.

THE AMERICAN OPEN JOINT STOVE CHECKER for BLAST FURNACE STOVES

* * * * *

An efficient stove is a necessity for satisfactory operation of the Blast Furnace, the very foundation of steel manufacture. To obtain sufficient heating surface with standard brick shapes, four stoves were necessary to operate a 500 to 600 ton blast furnace. The increase in the size of the blast furnace to 1,000 ton capacity made increased heating capacity in stoves a necessity. The American Open Joint Checker not only provides the surface required, but provides it in three (3) standard sized stoves, thus reducing the capital expenditure by the cost of one (1) stove and all auxiliary equipment necessary.

Orders for seven (7) stoves and results obtained on those already operating, prove the efficiency and reasonable cost of the American Open Joint Checker.



WILLIAM M. BAILEY COMPANY

Engineers

MAGEE BLDG.

PITTSBURGH, PA.

European Agents—Ashmore, Benson, Pease & Co. Ltd., Stockton-on-Tees, England

MODERN PROCEDURE IN ALLOY STEEL PRODUCTION

A Series of Advertisements Based on Timken Methods

No. 4

Metallography

Metallographic inspection plays an exceedingly important part in the maintenance of the high and uniform physical properties for which Timken Alloy Steels are noted.

The Timken Metallographic Laboratory is one of the most efficient in the steel industry—both as regards the extent and modern-ness of its equipment and the knowledge and experience of its personnel.

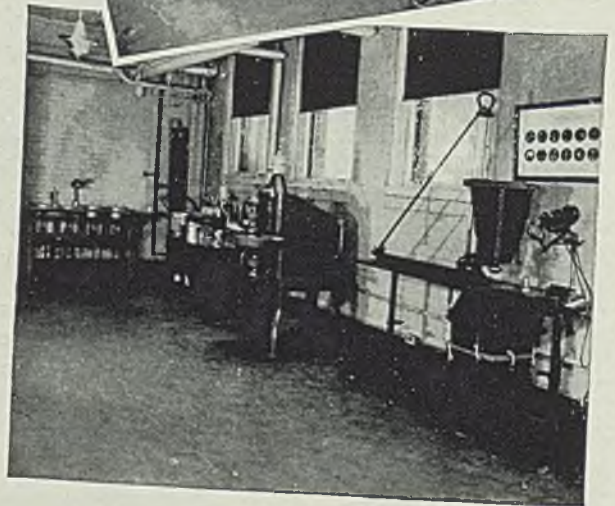
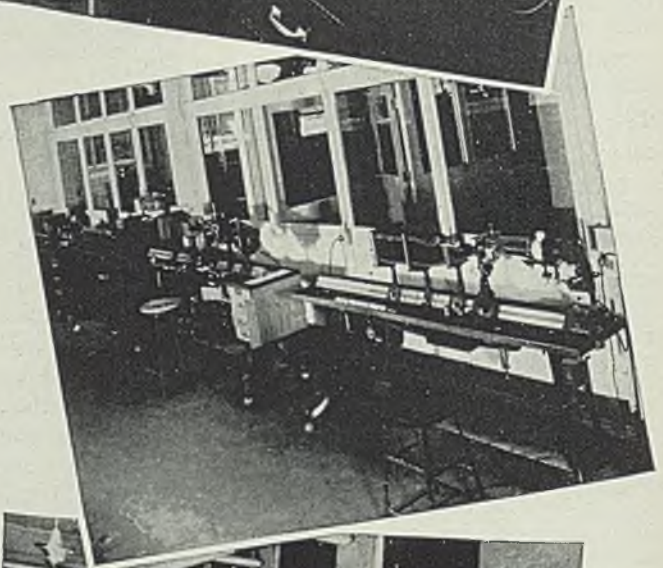
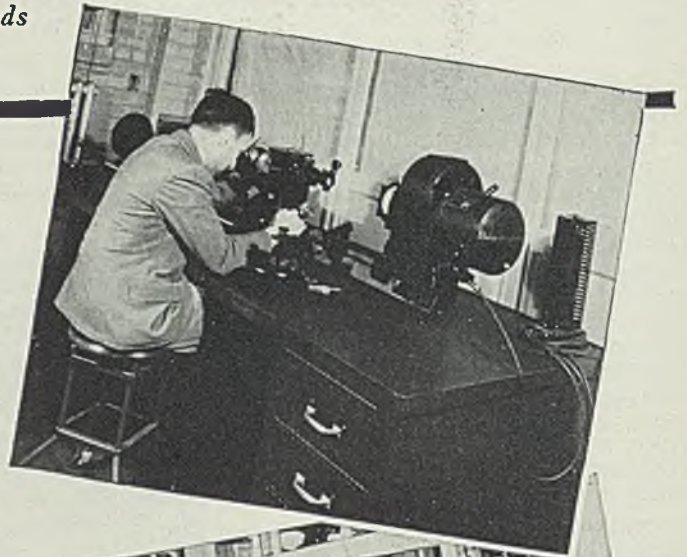
In the course of the daily work of the Timken Metallographic Laboratory each heat of steel is carefully checked for grain size. Metallographic checks are likewise made of heat treated and annealed sections for machinability. A thorough check for non-metallic inclusions is also part of the regular routine. No heat is passed that does not comply with the customer's specifications for metallographic structure and cleanliness.

Large numbers of samples are regularly handled, including a full range of standard analyses and a wide range of low, medium and high alloys. In addition to this daily inspection procedure, a continuous program of metallographic research and development is carried on in conjunction with the work of the Timken Research Laboratory.

When a heat of Timken Steel is approved by the Timken Metallographic Laboratory you are assured of its ability to meet your requirements.

THE TIMKEN STEEL & TUBE COMPANY, CANTON, OHIO

District Offices or Representation in the following cities:
Detroit Chicago New York Los Angeles Boston
Philadelphia Houston Buffalo Rochester Syracuse Tulsa
Cleveland Erie Dallas Kansas City
St. Louis Cincinnati Huntington Pittsburgh Minneapolis
World's Largest Producer of Electric Furnace Steel



TIMKEN ALLOY STEELS

ELECTRIC FURNACE AND OPEN HEARTH • ALL STANDARD AND SPECIAL ANALYSES

Price Changes Due This Week; Rate $74\frac{1}{2}$

Miscellaneous Demand

Heavy; Steelworks

Backlogs Shrinking

PPRICE adjustments for the first quarter of 1937 on a number of steel products were nearing completion late last week and are expected to be announced early this week.

Considerable discussion of a \$2 a ton advance on semifinished steel, \$3 a ton on bars, shapes and plates, and possibly \$4 to \$5 a ton on sheets, was current.

Announcement of higher prices for first quarter is expected to result in considerable protective buying through December. From the producers standpoint, it is considered questionable in some quarters whether the increases will be enough to offset the added burdens of wage increases and other items.

Advances ranging from \$20 to \$50 a ton have been made in tool steel prices, the \$20 a ton applying on carbon grades, and the \$50 a ton on high speed.

Tin plate manufacturers have abolished the $7\frac{1}{2}$ per cent discount, effective Jan. 1. The contract price for 1937 extends the net market at \$4.85 per base box, Pittsburgh, a move which was believed principally due to competition with other container materials.

Under strong miscellaneous buying and with backlogs being worked down to the advantage of the delivery situation, steelworks operations advanced $\frac{1}{2}$ -point to $74\frac{1}{2}$ per cent, the eighteenth consecutive week that the rate has held between 70 to 75 per cent.

Not since 1929 has such a steady rate of operations been maintained for so long.

Assemblies Gain Again

AUTO production increased to 110,160 units, compared to 104,248 last week, a gain of 5912. Ford assembled better than 25,000 cars and Chevrolet about 28,000. Production this month is considerably ahead of the corresponding period last year. In the week ending Nov. 16, 1935, 93,177 units were assembled, and in the week ending Nov. 23, 1935, 94,723 units were assembled.

The gain in auto production is reflected in many lines of the iron and steel industry. At Chicago, with mills booked for the remainder of the year, sheet producers are soliciting no new business. Bar shipments and wire consumption have been assisted materially.

Rail awards included 20,000 tons placed by Union Pacific, 6000 by Illinois Central and 500 by the Cotton Belt. Western carriers are expected to close soon on about 275,000 tons. Railroad shops are taking mod-

MARKET IN TABLOID

DEMAND . . . Miscellaneous demand strong.

PRICES . . . Announcements expected this week.

PRODUCTION Rate advances to $74\frac{1}{2}$.

SHIPMENTS . . . Steady.

erate tonnages for repair work, but delays are met in closing on the proposed purchases of new cars. Aggregate purchases of cars were relatively small last week, but inquiries for some 3000 cars went out.

With close to 3000 beehive coke ovens active in the western Pennsylvania district, only about 1000 more could be put in operation and to many of these extensive repairs would be necessary. Fifty-five additional ovens were placed on schedule last week by one company which already had 525 ovens in production at two plants.

Foundries Increase Stocks

ALTHOUGH shipments are increasing rapidly, most pig iron sellers expect to be able to complete deliveries by the end of this year. Many foundries have anticipated a price advance and will have large stocks on hand Jan. 1.

STEEL'S scrap composite is down 4 cents to \$16.00, due to a decrease in the price of compressed sheets at Philadelphia. At Pittsburgh advances were made in electric furnace grades but heavy melting steel remained quiet. At Chicago one mill purchased a small tonnage of heavy melting at \$16.50, 25 cents below a previous sale.

Shape Awards Decline

THE iron and steel composite is down 1 cent to \$34.59 and the finished steel index is unchanged at \$53.90.

Shape awards were off about 14,500 tons to 11,146, including 2980 tons for alterations to a lock and dam at Emsworth, Pa. Concrete reinforcing bar awards, at 2706 tons, held even with the previous week and included 1750 tons for a San Francisco reservoir.

Operations in Chicago district were up $\frac{1}{2}$ point to $76\frac{1}{2}$ per cent; Youngstown 3 to 73 and Eastern Pennsylvania $\frac{1}{2}$ to 48. Pittsburgh was down 1 to 67; Wheeling 3 to 89 and Cleveland 1 to $79\frac{1}{2}$.

COMPOSITE MARKET AVERAGES

	Nov. 21	Nov. 14	Nov. 7	One Month Ago Oct., 1936	Three Months Ago Aug., 1936	One Year Ago Nov., 1935	Five Years Ago Nov., 1931
Iron and Steel . . .	\$34.59	\$34.60	\$34.60	\$34.67	\$33.88	\$33.15	\$30.16
Finished Steel . . .	53.90	53.90	53.90	53.90	53.40	53.70	48.17
Steelworks Scrap . .	16.00	16.04	16.04	16.44	14.66	12.92	8.22

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

	Nov. 21, 1936	Oct. 1936	Aug. 1936	Nov. 1935		Nov. 21, 1936	Oct. 1936	Aug. 1936	Nov. 1935
Finished Material					Pig Iron				
Steel bars, Pittsburgh	2.05c	2.05c	1.95c	1.85c	Bessemer, del. Pittsburgh	\$20.8132	20.8132	20.8132	20.81
Steel bars, Chicago	2.10	2.10	2.00	1.90	Basic, Valley	19.00	19.00	19.00	19.00
Steel bars, Philadelphia	2.36	2.36	2.26	2.16	Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	20.81
Iron bars, Terre Haute, Ind.	1.95	1.95	1.85	1.75	No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	20.31
Shapes, Pittsburgh	1.90	1.90	1.90	1.80	No. 2 fry., Chicago	19.50	19.50	19.50	19.50
Shapes, Philadelphia	2.11 1/4	2.11 1/4	2.11 1/4	2.01 1/4	Southern No. 2, Birmingham	15.50	15.50	15.50	15.50
Shapes, Chicago	1.95	1.95	1.95	1.85	Southern No. 2, del. Cincinnati	19.44	19.44	19.44	20.2007
Tank plates, Pittsburgh	1.90	1.90	1.90	1.80	No. 2X eastern, del. Phila.	21.6882	21.6882	21.6882	21.68
Tank plates, Philadelphia	2.09	2.09	2.09	1.99	Malleable, Valley	19.50	19.50	19.50	19.50
Tank plates, Chicago	1.95	1.95	1.95	1.85	Malleable, Chicago	19.50	19.50	19.50	19.50
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.95	1.85	Lake Sup., charcoal, del. Chicago	25.7528	25.7528	25.2528	25.25
Sheets, No. 24, hot ann., Pitts.	2.60	2.60	2.50	2.40	Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.20	3.10	Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	19.67
Sheets, No. 10, hot rolled, Gary	2.05	2.05	2.05	1.95	Scrap				
Sheets, No. 24, hot anneal., Gary	2.70	2.70	2.60	2.50	Heavy melting steel, Pittsburgh	\$17.25	\$18.15	\$16.00	\$13.65
Sheets, No. 24, galvan., Gary	3.30	3.30	3.30	3.20	Heavy melt. steel, No. 2, east. Pa.	13.50	13.95	12.80	11.00
Plain wire, Pittsburgh	2.50	2.50	2.40	2.30	Heavy melting steel, Chicago	16.50	16.25	15.45	13.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25	Rail for rolling, Chicago	17.25	16.95	16.40	14.30
Wire nails, Pittsburgh	2.05	2.05	2.10	2.40	Railroad steel specialties, Chicago	18.25	17.75	16.65	13.75
Semifinished Material					Coke				
Sheet bars, open-hearth, Youngs.	\$32.00	\$32.00	\$30.00	\$29.50	Connellsville, furnace, ovens	\$4.00	\$4.00	\$3.45	\$3.55
Sheet bars, open-hearth, Pitts.	32.00	32.00	30.00	29.50	Connellsville, foundry, ovens	4.25	4.25	4.25	4.35
Billets, open-hearth, Pittsburgh	32.00	32.00	30.00	28.50	Chicago, by-product foundry, del.	9.75	9.75	9.75	9.75
Wire rods, No. 5 to 1 1/2-inch, Pitts.	40.00	40.00	38.00	38.00					

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel		Tin Mill Black No. 28		Corrosion and Heat-Resistant Alloys				Structural Shapes	
Prices Subject to Quantity Extras and Deductions (Except Galvanized)		Pittsburgh	2.75c	Pittsburgh base, cents per lb.				Pittsburgh	1.90c
Hot Rolled No. 10, 24-48 in.		Gary	2.85c	Chrome-Nickel				Philadelphia, del.	2.11 1/2 c
Pittsburgh	1.95c	St. Louis, delivered	3.08c	No. 302 No. 304				New York, del.	2.16 1/2 c
Gary	2.05c	Cold Rolled No. 10		Chicago, delivered				Boston, delivered	2.30 1/2 c
Chicago, delivered	2.08c	Pittsburgh	2.60c	Plates				Bethlehem	2.00c
Detroit, del.	2.15c	Gary	2.70c	No. 23.00 No. 24.00				Chicago	1.95c
New York, del.	2.30c	Detroit, delivered	2.80c	Plates				Cleveland, del.	2.10c
Philadelphia, del.	2.26c	Philadelphia, del.	2.91c	Sheets				Buffalo	2.00c
Birmingham	2.10c	New York, del.	2.95c	Hot strip				Gulf Ports	2.30c
St. Louis, del.	2.28c	Pacific ports, f.o.b. cars, dock	3.20c	Cold strip				Birmingham	2.05c
Pacific ports, f.o.b. cars, dock	2.50c	Cold Rolled No. 20		Straight Chromes				Pacific ports, f.o.b. cars, dock	2.45c
Hot Rolled Annealed No. 24		Pittsburgh	3.05c	No. No. No. No.				Bars	
Pittsburgh	2.60c	Gary	3.15c	410 430 442 446				Soft Steel	
Gary	2.70c	Detroit, delivered	3.25c	Bars				(Base, 3 to 25 tons)	
Chicago, delivered	2.73c	Philadelphia, del.	3.36c	Plates				Pittsburgh	2.05c
Detroit, delivered	2.80c	New York, del.	3.40c	Sheets				Chicago or Gary	2.10c
New York, del.	2.95c	Enameling Sheets		Hot strip 15.75 16.75 21.75 26.75				Buffalo	2.20c
Philadelphia, del.	2.91c	Pittsburgh, No. 10	2.45c	Cold stp. 20.50 22.00 27.00 35.00				Birmingham	2.20c
Birmingham	2.75c	Pittsburgh, No. 20	3.05c	Steel Plate				Cleveland	2.10c
St. Louis, del.	2.935c	Gary, No. 10	2.55c	Pittsburgh				Buffalo	2.15c
Pacific ports, f.o.b. cars, dock	3.25c	Gary, No. 20	3.15c	New York, del.				Detroit, delivered	2.20c
Galvanized No. 24		Tin and Terne Plate		Philadelphia, del.				Pacific ports, f.o.b. cars, dock	2.60c
Pittsburgh	3.20c	Gary base, 10 cents higher.		Philadelphla, del.				Philadelphla, del.	2.36c
Gary	3.30c	Tin plate, coke base		Boston, delivered				Boston, delivered	2.47c
Chicago, delivered	3.33c	(box) Pittsburgh	\$5.25	Buffalo, delivered				New York, del.	2.40c
Philadelphia, del.	3.51c	Do., waste-waste	2.75c	Chicago or Gary				Pitts., forg. qual.	2.40c
New York, del.	3.55c	Do., strips	2.50c	Cleveland, del.				Rail Steel	
Birmingham	3.35c	Long ternes, No. 24 unassorted, Pitts.	3.50c	Cleveland, del.				To Manufacturing Trade	
St. Louis, del.	3.53 1/2 c	Do., Gary	3.60c	Birmingham				Pittsburgh	1.90c
Pacific ports, f.o.b. cars, dock	3.80c			Coatesville, base				Chicago or Gary	1.95c
				Sparrows Pt., base				Moline, Ill.	1.95c
				Pacific ports, f.o.b. cars, dock				Cleveland	1.95c
				St. Louis, delivered				Buffalo	2.00c

Pig Iron

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

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$20.50	\$21.00	\$20.00	\$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	21.50	22.00	21.00	22.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00

Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	22.00	22.50	21.50	23.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.55	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	19.82	20.58	20.08	.....
Cincinnati from Birmingham	19.44	.....	18.44	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.17	21.77	21.27	.....
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.27	21.07
Muskegon, Mich., from Chicago, Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	.....	.....	.....	.....
Saginaw, Mich., from Detroit	21.75	21.75	21.25	22.25
St. Louis, northern	20.00	20.00	19.50	.....

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	\$19.68	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44
†Over 0.70 phos.	.....	.....	.....	.....

Low Phos.
Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., \$24.00, Phila. base, standard and copper bearing, \$25.13.

Gray Forge	Charcoal
Valley furnace	19.00 Lake Superior fur. \$22.50
Pitts. dist. fur.	19.00 Do., del. Chicago 25.75
	Lylees, Tenn. 22.50

Silvery†
Jackson county, O., base; 6-6.50 per cent \$22.75; 6.51-7—\$23.25; 7-7.50—\$23.75; 7.51-8—\$24.25; 8-8.50—\$24.75; 8.51-9—\$25.25; 9-9.50—\$25.75; 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) ..
Fire Clay Brick	\$45.00
Super Quality	.....
Pa., Mo., Ky.	\$55.00
First Quality	.....
Pa., Ill., Md., Mo., Ky.	\$45.00
Alabama, Georgia	\$38.00-45.00
Second Quality	.....
Pa., Ill., Ky., Md., Mo.	40.00
Georgia, Alabama	35.00
Ohio	.....
First quality	\$40.00
Intermediary	37.00
Second quality	28.00
Malleable Bung Brick	.....
All bases	50.00
Silica Brick	.....
Pennsylvania	\$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	48.00
Ladle Brick (Dry Press)	.....
Pa., O., W. Va., Mo.	\$24.00
do., wire cut	22.00
Magnesite	.....
Imported dead-burned grains, net ton f.o.b.	.....
Chester, Pa., and Baltimore bases (bags) ..	\$45.00
Domestic dead-burned grains, net ton f.o.b.	.....
Chester, Pa., and Baltimore bases (bags) ..	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk) ..	22.00
Base Brick	.....
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	.....
Chrome brick	\$45.00
Chem. bonded chrome	45.00
Magnesite brick	65.00
Chem. bonded magnesite	55.00
Fluorspar, 85-5	.....
Washed gravel, duty paid, tide, net ton.	\$22.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	.....
Do., for barge	\$19.00

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

Copper			Straits Tin		Lead		Zinc		Alumi- num		Antimony		Nickel	
Electro, del. Conn.	Lake, Midwest refinery	Casting.	New York Spot	Futures	Lead N. Y.	East St. L.	St. L.	99%	99%	Chinese Spot, N. Y.	Cath- odes	.....	.....	.....
Nov. 14	10.50	10.62½	52.50	51.90	5.10	4.95	4.95	*19.00	12.50	35.00	35.00	.....	.....	.....
Nov. 16	10.50	10.62½	51.65	51.10	5.20	5.05	4.95	*19.00	12.50	35.00	35.00	.....	.....	.....
Nov. 17	10.50	10.62½	51.65	51.15	5.20	5.05	5.05	*19.00	12.50	35.00	35.00	.....	.....	.....
Nov. 18	10.50	10.62½	51.37½	50.95	5.20	5.05	5.05	*19.00	12.50	35.00	35.00	.....	.....	.....
Nov. 19	10.50	10.62½	51.45	51.05	5.20	5.05	5.05	*19.00	12.50	35.00	35.00	.....	.....	.....
Nov. 20	10.50	10.62½	51.15	50.85	5.20	5.05	5.05	*19.00	12.50	35.00	35.00	.....	.....	.....

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS			OLD METALS		Light Brass	
F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.50c Conn. copper			Deal. buying prices, cents lb.		Chicago	
			No. 1 Composition Red Brass		*Cleveland	
			*New York		4.00-4.25	
			*Cleveland		4.25-4.50	
			*Chicago		St. Louis	
			7.50-7.75		3.75-4.25	
			7.00-7.25		Lead	
			*St. Louis		*New York	
			6.75-7.25		4.37½-4.50	
			Heavy Copper and Wire		Cleveland	
			New York, No. 1		4.00-4.25	
			8.10-8.12½		Chicago	
			Chicago, No. 1		4.00-4.25	
			8.37½-8.62½		*St. Louis	
			*Cleveland, No. 1		4.00-4.25	
			8.50-8.75		*St. Louis	
			8.25-8.75		4.00-4.25	
			Composition Brass Borings		Zinc	
			*New York		*New York	
			5.87½-6.00		2.50-2.62½	
			Light Copper		*Cleveland	
			*New York		2.50-3.00	
			6.37½-6.62½		St. Louis	
			*Chicago		2.50-2.75	
			7.00-7.25		Aluminum	
			Cleveland		Borings, Cleve.	
			6.75-7.00		9.75-10.00	
			*St. Louis		Mixed, cast, Cleve.	
			6.75-7.25		13.00-13.25	
			Secondary Metals		Mixed, cast, St. L.	
			Brass Ingot, 85-5-5-5		13.00-13.25	
			Stand. No. 12 alum.		*Clips, soft, Cleve.	
			16.75-17.25		14.75-15.00	

Dollars, except Ferrochrome	
Ferromanganese, 78-82% tidewater, duty paid..	75.00
Do., Baltimore, base..	75.00
Do., del. Pittsburgh..	80.13
Spiegeleisen, 19-20% dom.	.....
Palmerston, Pa., spot	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight allowed, c. l.	69.50
Do., less carload	77.00
Do., 75 per cent.	126-130.00
Spot, \$5 a ton higher.	.....
Silicomane, 2½ carbon	85.00
2% carbon, 90.00; 1%, 100.00	.....
Ferrochrome, 66-70 chromi- um, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30-1.40
Ferrovandium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	37.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, \$3 unitage	58.50
Ferrophosphorus, electro- lytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% \$3 unitage.	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80
†Carloads. Quan. diff. apply	.....

Bars

Bar Prices, Page 76

Cleveland—New bar business improved somewhat the past week and is expected to show even greater gains through the rest of the quarter, resulting from the general assumption that prices are to be advanced. Nut and bolt concerns and auto partsmakers are the heaviest consumers here. The alloy bar market also shows gains, resulting from increased activity among auto builders. Deliveries are reasonably prompt at present, but some believe this condition will tighten rather than improve in the near future.

Chicago—Bar specifications are slightly heavier, with automotive needs more prominent. Tractor manufacturers are taking heavy shipments and operations of farm implement builders are steady or slightly higher. Bar producers are able to give fairly prompt shipment on new business, though deliveries on the average still are around three weeks. While some business is being stimulated by anticipated price advances, speculative purchasing so far has not been heavy.

Philadelphia — Commercial bars are believed likely to be advanced \$3 for first quarter. A deadline of Dec. 31 on shipments is believed unlikely as one large mill is offering to take specifications up to the end of December, with rollings falling into first quarter. Buying is active.

New York—Commercial bars are moving briskly and sellers anticipate an advance of at least \$3. It seems probable specifications will be limited to Dec. 31, which means shipments would extend into first quarter. One large mill is reliably reported as already accepting orders on this basis.

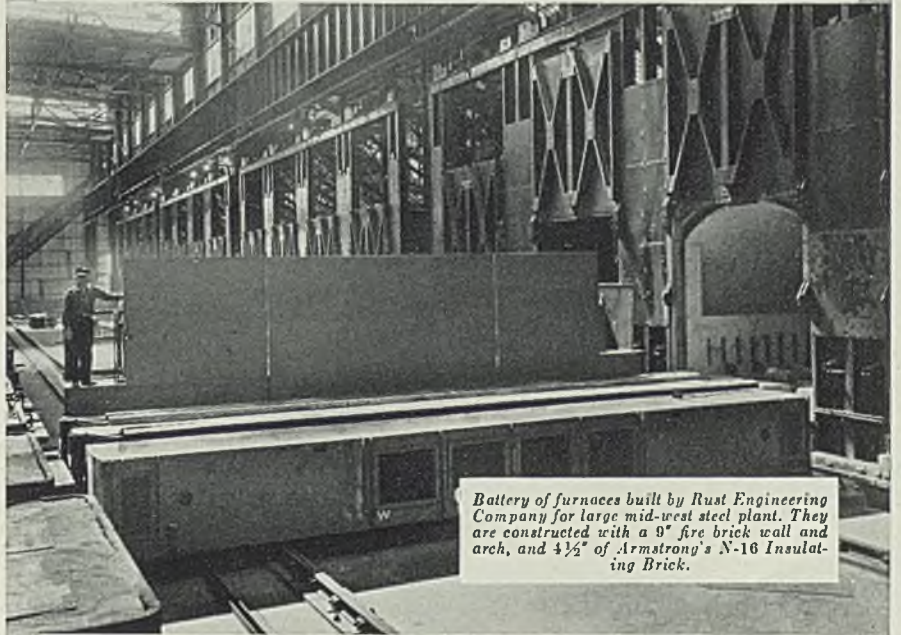
Plates

Plate Prices, Page 76

Pittsburgh—Many plate fabricators have experienced a decline in the number of projects up for bid, although their backlogs guarantee present operations for 30 to 45 days. Probably due to approaching restrictions on navigation, marine demand for plates has fallen off. Aside from a few orders for single barges at various locations, no important contracts have been placed. McCrady-Rodgers Co., Pittsburgh, has placed a contract for four boilers, to be placed on its Ohio river steamer WILLIAM B. RODGERS, with the Pearson Mfg. Co. Marietta Mfg. Co.,

RUST insulated this battery of efficient furnaces for

LONG-LIFE ECONOMY



Battery of furnaces built by Rust Engineering Company for large mid-west steel plant. They are constructed with a 9" fire brick wall and arch, and 4½" of Armstrong's N-16 Insulating Brick.

... and Armstrong's Brick was their choice

THESSE modern furnaces, built by the Rust Engineering Company, are considered to be among the most economical in operation today. They hold 100 tons of sheets, or from 50 to 60 tons of coils, and operate with 8 to 10 gallons of oil per ton of finished product. This outstanding economy is permanently assured by the use of Armstrong's N-16 Brick as insulation.

Armstrong's N-16 Insulating Brick are designed for use up to 1600° F. behind the refractory. Other Armstrong Insulating Brick are N-20 and N-25, for temperatures up to 2000° and 2500° F., respectively, behind the refractory. Armstrong also

manufactures two Insulating Fire Brick — EF-22 and EF-26 — which are designed for temperatures up to 2000° and 2600° F., respectively.

Armstrong's Brick are the choice of leading furnace builders and plant operators because they are efficient, have high crushing strength, are accurately sized, are made under rigid specifications, and are carefully tested to insure the uniformly high quality required for successful results. For full information, write today for descriptive folder. Armstrong Cork Products Company, Building Materials Division, 985 Concord Street, Lancaster, Pennsylvania.



Armstrong's

HIGH TEMPERATURE INSULATION

Point Pleasant, W. Va., is building a 173 x 44 x 5½-foot steel towboat for export to Colombia, South America. Delivery will be made early in 1937.

Cleveland — Mills report little change in general run of orders, but some feel that considerable pending tonnage is involved in ship repair work during the winter months. Nothing further has been announced regarding the recent Chesapeake & Ohio railroad inquiry for 2000 cars. Prices remain firm and unchanged, but many feel that a \$2 or \$3 advance will soon be announced.

Chicago—Plate business still is relatively quiet, though larger orders are in prospect for railroad equipment. Railroad shops are taking moderate tonnages for repair work, but delays are met in closing on proposed purchases of freight cars. For a conduit at Denver, 5000 tons will be required, while additional plate tonnages are involved in Mississippi river dams now pending.

New York—The outlook is promising for heavy buying of plates through the remainder of the year. In addition to 30,000 tons of riveted steel for a pipe line recently noted as under contemplation for various projects there are 15 to 20 oil refinery projects now under active consideration and an expanding volume of railroad equipment work.

Birmingham, Ala.—With three or four large contracts still pending plate mills are producing steadily. The prospects are still bright though no contracts of size have been reported recently. Manufacture of large sized pipe for local consumption is under way yet and plate is furnished from mills near-by. Bids are out on barge construction which may develop into considerable business for plate.

Philadelphia—With announcement of increases expected soon plate consumers here are buying more actively. However, demand so far has lagged in comparison with most other major lines. This is attributed in part to the fact that district plate makers have been able to supply fairly easy deliveries and to a general opinion that impending advances will not become effective before first quarter. Approximately 400 tons of plates will be required for 10 locomotives for the Western Maryland and 200 tons for five for the Lackawanna.

San Francisco—Demand for plates is limited to small lots. To date this year 111,252 tons have been placed, compared with only 43,550 tons for the same period last year. It is thought that bids on the floating drydock for Pearl Harbor, T. H., scheduled to be opened on Nov. 25, may again be postponed to enable

Steel Price Advance Probable This Week

Adjustment of prices on steel products for first quarter have been under consideration and announcement is expected early this week. Some talk is heard that bars and shapes and possibly plates will be advanced \$3 per ton, semifinished steel \$2 per ton and sheets \$4 to \$5 per ton on various grades.

Time in which to submit proposals. Approximately 30,000 tons of plates and shapes will be required.

Seattle—Increased interest in plates is noted. Shops are running short of material because of the layup of intercoastal steamers.

Contracts Placed

356 tons, 36-inch water supply pipe for Spokane, Wash., to Steel Tank & Pipe Co., Portland, Oreg.; Clifton & Applegate, Spokane, general contractors.

155 tons, tanks, sewage treatment, section 4, Wards Island, New York, to Graver Tank & Mfg. Co. Inc., East Chicago, Ind.

135 tons, barge, 100 x 36 x 7 feet, for Gulf Oil Corp., at Baltimore, Md., to Pennsylvania shipyards.

79 tons, 24 tanks, in Massachusetts and Maine for Barrett Co., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

5000 tons, conduit No. 17, Denver; Williams Bros. Corp., Tulsa, Okla., low. Unstated, discharge pipes, Dead Ox division, Owyhee project; bids in.

Unstated, 70-inch supply pipe for Bitter Root irrigation district, Montana; bids in.

Transportation

Track Material Prices, Page 77

Railroad inquiry and buying of rails and rolling stock continue active and promise increasing tonnage of steel. Rails placed last week total 26,500 tons, Union Pacific distributing 20,000 tons, Illinois Central 6000 tons and the Cotton Belt 500 tons. Western roads are expected to close soon for about 275,000 tons.

Edward G. Budd Mfg. Co., Philadelphia, has booked four streamlined trains of three cars each and two of four cars each for the Chicago, Rock Island & Pacific. These will require several hundred tons of stainless steel sheets.

Union Pacific has awarded 300 underframes for automobile cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., and will build the cars in

its own shops. This road also has awarded 40 passenger coaches, five diners and five kitchen dormitories to Pullman-Standard Car Mfg. Co. The Virginian is inquiring for 25 automobile cars and for steel and parts for the repair of 500 gondolas.

Municipal subway system, New York, will open bids Dec. 11 for 250 subway cars. This system bought 500 cars about a year ago.

Duluth, Missabe & Northern is asking alternate bids on 250, 500 and 1000 ore cars and on 15 hoppers, all of 75 tons capacity. Chicago & North Western is inquiring for 350 to 500 hoppers and the Bessemer & Lake Erie for 2000 cars.

Chicago, Milwaukee, St. Paul & Pacific has placed 30 freight locomotives with Baldwin Locomotive Works, which will require 1200 tons of plates, and one Hiawatha-type locomotive with American Locomotive Co.

The Wabash has been authorized by federal court to spend \$165,413 for betterments, including rails, a steel water tank and some machine tools.

The prospective increase in price of standard steel rails is expected to extend to light rails, with the result that buyers of the latter are also manifesting livelier interest.

Pennsylvania railroad has closed on about 20,000 tons of spikes, tie plates, track bolts and other rail fastenings to accompany its recent order for 100,000 tons of 131 and 152-pound rails.

Car Orders Placed

Chicago, Rock Island & Pacific, 350 automobile cars to American Car & Foundry Co., New York.

Chicago, Rock Island & Pacific, six streamlined trains, four of three cars each and two of four cars, to Edward G. Budd Mfg. Co., Philadelphia.

Union Pacific, 300 underframes to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., cars to own shops; 40 passenger coaches, five diners and five kitchen dormitories, to Pullman-Standard Car Mfg. Co., Chicago.

Locomotives Placed

Chicago, Milwaukee, St. Paul & Pacific, 30 freight locomotives to Baldwin Locomotive Co., Philadelphia; one Hiawatha type passenger locomotive to American Locomotive Co., New York.

Rail Orders Placed

Cotton Belt, 500 tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Illinois Central, 6000 tons 112-pound rail, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Union Pacific, 20,000 tons to Carnegie-Illinois Steel Corp., Chicago, Colorado Fuel & Iron Co., Denver, and Inland Steel Co., Chicago.

Car Orders Pending

Atlantic Coast Line, parts for 400 box cars.

Bessemer & Lake Erie, 2000 freight cars.

—The Market Week—

made up of 1000 90-ton hoppers, 500 70-ton hoppers, and 500 mill-type gondolas.
 Chicago & North Western, 350 to 500 hopper cars.
 Duluth, Missabe & Northern, alternate bids 250, 500 and 1000 ore cars of 75 tons capacity; also 15 hopper cars, 75 tons capacity.
 Municipal subway, New York, 250 subway cars; bids Dec. 11.
 Virginian, 25 automobile cars; bids asked.
 Union Railroad 900 70-ton mill-type gondolas.

Sheets

Sheet Prices, Page 76

Pittsburgh—Most sheet business is specified for quick shipment. Buying, which is led by automobile requirements, represents an aggregate equal to October's weekly average. One encouraging factor has been the failure of jobbing mills to show their usual seasonal decline at this time. A sizable lot of enameling sheets will be used by Westinghouse Electric & Mfg. Co. at its Mansfield, O., and Springfield, Mass., works against a recent order for 16,697 electric refrigerators placed by the PWA to be used in low rent housing projects.

Cleveland—Mills report a noticeable improvement in sales, as a result of many consumers attempting to take advantage of present low prices. This added tonnage has forced some mills out of the market for the remainder of the quarter on cold-rolled material, and extended deliveries on hot-rolled to 3 or 4 weeks.

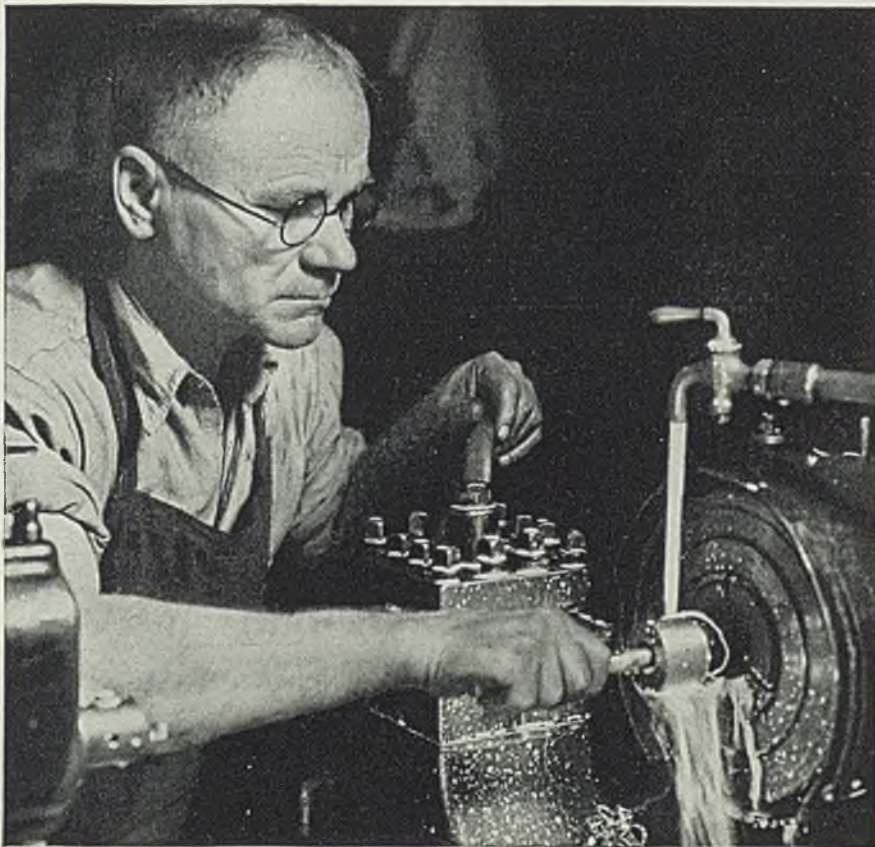
Chicago—Sheet producers are soliciting no new business, as mills are booked for the remainder of the year. Operations are near capacity and deliveries are being pushed as rapidly as possible, since some additional business is anticipated in view of the likelihood of higher prices next quarter. Consumption in the automotive industry is increasing and requirements of most other users are steady or heavier.

New York—Sheet consumers are still specifying heavily in an effort to protect themselves against an expected advance of \$4 with the possibility it may be made effective before Jan. 1.

Philadelphia—The sheet trade expects a price increase perhaps as high as \$4 per ton and with mills booked so far ahead it is believed the increases may become effective before first quarter. Anticipating some such general development consumers have been buying heavily.

Several hundred tons of stainless steel sheets will be required for streamlined railroad units just booked by Edward G. Budd Mfg.

GOOD OLD GUSTAF!



PHOTOGRAPH COURTESY D. O. JAMES MFG. CO.

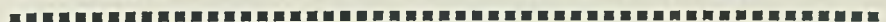
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HARD working. Serious. Thorough as they come — this Gustaf! One of the old school who looks on his work not as just a job, but as his trade — his profession — which he learned from the bottom up. Given the best there is to work with, Gustaf will top them all!

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dreds of modern-minded plants — getting the kind of results which the work of men like Gustaf really deserves.

A Standard Oil engineer is ready to see if his experience in every type of metal-working operation can help you as it has many others. Why not give your men the advantage of this free service? You may be surprised at the difference in production that even *one* improved lubrication practice can make! And can't you see the slow, broad grin on Gustaf's face as he shows you perfect finished work and an empty reject bucket?



Write for booklets covering lubrication problems in your plant. (List subjects or types of machinery in which you are most interested.)

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Name

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**STANDARD OIL COMPANY
 (Indiana)**

CORRECT LUBRICATION

Co., Philadelphia, for the Chicago, Rock Island & Pacific. This order includes four trains of three cars each and two of four cars each.

St. Louis—Increase is expected in the price of sheets for first quarter. As a result there has been an increase in buying and inquiries, which manifestation is expected to become more emphatic in December. Shipments continue on a large scale, but there is still heavy pressure to deliveries, indicating the material moving is going into immediate consumption.

Cincinnati—Orders for sheets

sputred last week. Books for fourth quarter remain open although near a point where all tonnage to Jan. 1 is engaged. Shipment problems are not aggravated but prospect of further increases in automotive demand is inducing study. Considerable speculative buying has been done, anticipating needs well into first quarter but this plan is by no means general among major consumers of sheets.

Birmingham, Ala.—With no indication of an early cessation in demand, sheet mills here are operating on a steady schedule.

Pipe

Pipe Prices, Page 77

Pittsburgh—Manufacturers Light & Heat Co., Pittsburgh, will build a small 8-inch gas pipe line across the Allegheny river near Warren, Pa. Carbide & Carbon Chemicals Corp., South Charleston, W. Va., and the Clayco Gas Co., Pittsburgh, have both applied for federal permission to lay short 4-inch gas pipe lines across the Guyandot river. C. & S. Pipe Line Co., recently chartered by the LaJita Oil Co., expects to begin construction on a 6-inch, 45-mile crude oil pipe line from the Bentonville field to Corpus Christi, Tex.

Cleveland—Standard pipe for industrial and domestic requirements is moving at the October rate. Jobbers' stocks show good turnover, with little stocking being reported. Cast iron pipe demand is quiet, no lettings being reported last week and few small inquiries in sight. Prices are firm.

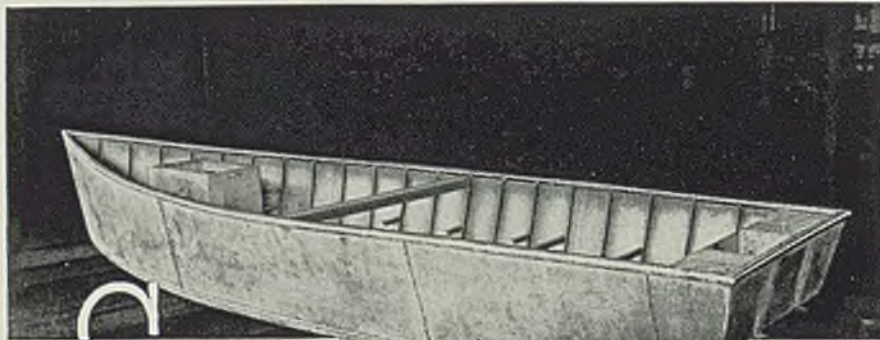
Chicago—Cast pipe shipments have moderated little so far this month, but December will bring a further decrease. Orders and inquiries are light and are lacking in large lots. Chicago has closed bids on 203 tons of fittings. Whether cast pipe prices will follow the impending rise in pig iron quotations remains to be determined.

New York—The bullish price situation in cast iron pipe is expected to materialize into a \$2 advance, bringing the base price to \$45 a ton. The probability of this immediate price rise is serving to drive in considerable tonnage, although principally on smaller and unidentified projects. Foundries are still able to make deliveries within a reasonable time.

Buffalo—Hearings now pending before the public service commission will determine large awards of pipe for natural gas line construction. This construction is opposed by railroads and other interests allied with the fuel trades. In the event the plan to build the lines is approved an important precedent in New York state public service procedure will be established. There is good inquiry for pipe for next year's construction programs in nearby oil fields.

Birmingham, Ala.—Production and delivery of cast pipe continue active. Several contracts are in the offing, and steady output is assured for some time to come.

San Francisco—Cast pipe demand remains quiet and little new business is expected to be placed during the balance of the year. Unnamed interests took 300 tons for



SEAWORTHY WELDING by PAGE

● Rivets are out and PAGE Welding in for these 30 ft. flat bottom boats built by the Erie Concrete and Steel Supply Company, Erie, Pennsylvania.

This is just another proof of the uniformity and excellence of PAGE Welding Electrodes and Welding Wires. Smooth-flowing (which means speed)—high ten-

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the treasury department at Point Defiance, Calif., and 130 tons of 4-inch for the Interior-Indian service at Albuquerque, N. M. United States Pipe & Foundry Co. is low on 343 tons of 6 to 12-inch Class 250, for Glendale, Calif.

Seattle—The cast pipe market is slow. Dealers are unable to obtain supplies, several shipments being held aboard ship and at terminals because of the maritime strike. Issaquah, Wash., will open bids Nov. 25 for 37,500 feet of 2 to 8 inch water pipe, cast iron and steel, hydrants, etc., Parker & Hill, Seattle, engineers.

Cast Pipe Placed

300 tons, treasury department, for Point Defiance, Calif., to unnamed interest.
203 tons, 3 to 24-inch fittings, Chicago, to United States Pipe & Foundry Co., Burlington, N. J.
176 tons, 4 to 8-inch, Tuscon, Ariz., to Pacific States Cast Iron Pipe Co., Provo, Utah.
130 tons, Interior-Indian service, 4-inch, Albuquerque, N. Mex., to unnamed interest.

Cast Pipe Pending

343 tons, 6 to 12-inch, Glendale, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

Strip

Strip Prices, Page 77

Pittsburgh—In anticipation of first quarter price rise, strip users have been ordering more generously with the assurance that specifications, especially for narrow hot-rolled and cold-rolled strip, will be satisfactory for the next three to four weeks at least. Only in wide hot-rolled strip is there a condition whereby mills are short on backlogs.

Cleveland — Auto partsmakers show consistent gains in activity here for the last few weeks, in view of the much heralded increased production schedules among auto builders. Bolstering this new tonnage is the high rate of steady activity among electrical equipment manufacturers and small farm tools concerns. Consumers' stocks are normal, but in spite of this some forward buying is in evidence, thus forcing sales ahead of the corresponding period last month.

Chicago—Strip bookings have been aided somewhat by customers' anticipation of higher prices. At the same time, consumption is well maintained among most users and is increasing steadily in the automotive industry. Producers of cold-rolled strip are well booked for this quarter but are able to accept addi-

tional tonnages of hot-rolled strip for delivery before Jan. 1.

Wire

Wire Prices, Page 77

Pittsburgh—Several cases of merchant wire product users' attempts to get coverage at the present market for first quarter were met last week by the intimation that the market would be quotably higher for that time. A first-quarter price announcement has been delayed, and in

the meantime, buyers are availing themselves fully of the \$2.05 level on nails, 2.55c, base, on galvanized barbed wire, and 2.80c on annealed fence wire, with fencing still quoted \$60 per base column. Plain manufacturing wire at 2.50c, Pittsburgh, and spring wire at 3.05c are being subjected to considerable test in the form of heavy buying from a variety of sources.

Cleveland—Mills here report deliveries ranging from two to three weeks, depending on their ability to keep a normal stock of wire rods. Nails and welding wire are reported



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It is important to make these vital elements basically sound and accurately adapted to their purpose by using prime quality materials.

B & L Cold Finished Steels are developed to meet these exacting requirements and to insure an extra factor of service when employed in the fabrication of machinery and equipment.

B & L Steel Shafting is furnished Cold Drawn—Turned and Polished—Drawn, Ground and Polished—Turned, Ground and Polished—and made to B & L standards of uniformity, straightness, concentricity and size tolerances.

Ultra-Cut Steel is industry's high speed screw stock—furnished in Rounds, Squares and Hexagons—for making quality machine parts at greatly increased rates of production.

Descriptive Folders on Shafting and Screw Stock will be sent on request.

BLISS & LAUGHLIN, INC.
HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

in good demand, but the largest tonnage is in standard bright wire most of which is used by bolt and nut concerns. Stocks of manufacturing consumers are normal with little opportunity for stocking. First quarter prices have not been announced, but many feel that an increase is inevitable.

Chicago—Wire demand is well sustained and shipments make a favorable comparison with those of preceding months. Heavier requirements of automotive interests are helping to sustain consumption of manufacturers' wire. Active con-

sumption is more responsible for the maintenance of buying than is the speculative feature. Prices on both merchant products and manufacturers' wire have been steady.

Shapes

Structural Shape Prices, Page 76

New York—Lettings of structural shapes last week totaled more than 3000 tons, and approximately 5000 tons are nearing the final award

stage. The largest single letting is 1000 tons for the F. & M. Schaeffer Brewing Co., Brooklyn, N. Y., booked by Ingalls Iron Works, Birmingham, Ala. Prices on erected steel continue steady.

Pittsburgh—Most structural fabricators are now expecting, or have already experienced, a lull but prospects are encouraging. One interesting sidelight is the number of partially completed buildings, construction on which was ceased during the depression, which are now about to be finished. American Bridge Co., Pittsburgh, has taken a contract for 3450 tons in alterations to the Emsworth dam on the Ohio river near Pittsburgh, as well as a 1230-ton viaduct at Denver. Among structural inquiries are 2000 tons for Schaefer Brewing Co. stockhouses at Brooklyn, N. Y., 1650 tons for a Florida bridge and 550 tons for a shipping building at Youngstown, O., for Republic Steel Corp.

Cleveland—Mill deliveries are reported considerably improved since the first of the month. Few jobs of size were let last week, but private orders well under 100 tons were plentiful, aggregating considerable tonnage. Bids went in last week on an extension to plant for Twin Coach Co., Kent, O., involving 200 tons; and on a shipping building at Youngstown, O., for Republic Steel Corp., Cleveland, involving 550 tons.

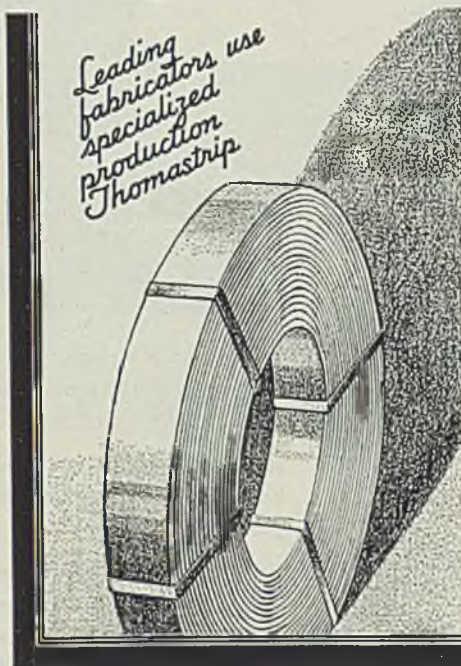
Chicago—Structural inquiries total about 12,000 tons, half of which is small miscellaneous lots. The largest of new projects is 2000 tons for Indianapolis street railway buildings and 1200 tons for a Mississippi river dam. Inquiries for two additional dams are expected within a few weeks. Shipments by structural fabricators are ahead of new business, but operations are at a fair rate for this period.

Buffalo—Structural awards continue to come forward at a good rate and winter backlogs of local fabricators are assuming large proportions. Large projects are pending in Tonawanda and Niagara Falls. The whole structural outlook is ex-

Look to the Specialist to best serve your requirements for cold rolled strip steel

Year after year Thomas Steel has the privilege of proving to an increasing number of metal fabricators that better products, better service and better profits result from the use of Thomastrip. Thomas specialized production provides exclusive attention and concentration on the proper specification, exacting manufacture and dependable delivery of one product—cold rolled strip steel. The experience, the modern facilities, and the engineering resourcefulness of this specialized organization assures to each individual customer that complete dependability of material and service which progressive management demands. It will pay you to investigate Thomastrip for your product.

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WARREN, OHIO
Specialized Producers of Cold Rolled Strip Steel



Thomas Strip

COLD ROLLED
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Shape Awards Compared

	Tons
Week ended Nov. 20	11,146
Week ended Nov. 13	25,671
Week ended Nov. 6	22,497
This week, 1935	12,209
Weekly average, 1935	17,081
Weekly average, 1936	21,903
Weekly average, October... ..	16,068
Total to date, 1935	782,941
Total to date, 1936	1,029,467

ceptionally bright for this season.

St. Louis—Small orders predominate. The Missouri State Highway Commission on Dec. 1 will let contracts for bridges involving 1060 tons.

San Francisco—Awards aggregated only 872 tons, bringing the total to date to 150,401 tons, compared with 108,656 tons for the corresponding period in 1935. No new inquiries of size have developed recently.

Seattle—Bids were opened at Denver by bureau of reclamation for one of the major contracts for Coulee dam, 20 sets of gates and linings, of unstated tonnage. Fabricating plants have been forced to restrict operations due to lack of materials because of the maritime strike. As bids were based on water transportation, deliveries will be delayed.

Shape Contracts Placed

2980 tons, alteration to Emsworth lock and dam, Emsworth, Pa., for U. S. engineer, Pittsburgh, to American Bridge Co., Pittsburgh.

1000 tons, building, F. & M. Schaefer Brewing Co., Brooklyn, N. Y., to Ingalls Iron Works, Birmingham, Ala.

700 tons, state highway bridge over Connecticut river, Chesterfield, N. H., to Bethlehem Steel Co., Bethlehem, Pa.

610 tons, River Bend steam station, North Carolina, to Ingalls Iron Works, Birmingham, Ala.

558 tons, bridge at Baldwinville Village, N. Y., to Phoenix Bridge Co., Philadelphia.

530 tons, Mary Louise Academy, Jamaica, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.; through Patrick Construction Corp., New York.

520 tons, bridge over Virgin river, Hurricane, Utah, to Bethlehem Steel Co., Bethlehem, Pa.

446 tons, 35 radial gates, Spec. 846-D, bureau of reclamation, Potholes, Calif., to unnamed interest.

360 tons, Colorado river bridge, Winchell, Tex., to American Bridge Co., Pittsburgh.

300 tons, building, American Rough Wool Co., South Plainfield, N. J., to Harris Structural Steel Co., New York.

275 tons, transmission towers, Ohio river crossings, to Blaw-Knox Co., Pittsburgh.

250 tons, boiler house, Dover, O., to Burger Iron Co., Akron, O.

250 tons, Rock Island railroad bridge, Ft. Worth, Tex., to American Bridge Co., Pittsburgh.

240 tons, passageways, for Triborough Bridge authority, New York, to American Bridge Co., Pittsburgh.

235 tons, TVA requirements 113052, operating bridge, Pickwick dam in Tennessee to Lackawanna Steel Construction Corp., Buffalo.

230 tons, warehouse, for National Casket Co., Albany, N. Y., to Clausen Iron Works, Albany, N. Y.

180 tons, bridge No. 320-D, Bowman county, North Dakota, to Illinois Steel Bridge Co., Jacksonville, Ill.

170 tons, building, R. E. Corp., Chicago,

to Wandnagel & Co., Chicago.

160 tons, Sioux Sanitorium, Rapid City, S. Dak., to Crown Iron Works Co., Minneapolis.

150 tons, alterations to theater, Lexington avenue and Thirty-fourth street, New York, to Dreier Structural Steel Co. Inc., New York.

150 tons, addition, SKF Industries, Philadelphia, to Robinson Iron & Steel Co. Inc., Philadelphia.

150 tons, alterations, building, 253 Broadway, to Norton Steel Co., New York.

135 tons, extension to Michigan Union building, Ann Arbor, Mich., to Whitehead & Kales Co., Detroit.

130 tons, girder spans, Chicago & Great

Western railroad, Chicago, to American Bridge Co., Pittsburgh.

120 tons, warehouse, Joseph H. Rheinfeld, distiller, Newark, N. J., to Charles Goeller, Hillside, N. J.

110 tons, three beam bridges in West Virginia for U. S. department of agriculture, specification No. 7440, to Bethlehem Fabricators Inc., Bethlehem, Pa.

105 tons, state bridge, Ronk, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

102 tons, bridges, Mineral and Fremont county, Colo., to unnamed interest.

Shape Contracts Pending

2500 tons, hangar, Newark, N. J., procurement division, treasury department, Newark; bids Nov. 23.

SPECIAL SEAMLESS SHELLS SHAPES **A DEEP DRAWN TANKS, BOTTLES, ETC.**

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**This Seamless Drawn Tank is
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**MADE FROM
1/4" STEEL
WEIGHT
25 LBS.**

**10 3/4"
DEEP
8" DIAM.**

Stamping Specialists Since 1896

**An Experience You Should Not Overlook
Send Us Your Next Specification**

THE CROSBY COMPANY
BUFFALO, N. Y.

NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

2000 tons, carbarns, Indianapolis Railways Inc.; bids Dec. 7.

1600 tons, Red river bridge, Texas-Oklahoma; Kansas City Bridge Co., Kansas City, Mo., low.

1200 tons, Mississippi river dam No. 3, Red Wing, Minn.; bids to United States engineers, St. Paul, Dec. 15.

1060 tons, Missouri highway projects, including Oakland avenue bridge, St. Louis, 280 tons; Ballas road crossing, St. Louis county, 210 tons; Lake of Ozark bridge, Benton county, 570 tons; bids Dec. 1.

900 tons, state bridge, Lafayette, Ind.; Vincennes Bridge Co., Vincennes, Ind., low for general contract.

754 tons, grade crossing elimination, Chi-

ago Junction railway, Thirty-ninth street, Chicago.

715 tons, track stringers, Manhattan bridge, New York; M. D. Lieb, New York, low.

610 tons, state bridge, Austin, Minn.

550 tons, shipping building, Youngstown, O., for Republic Steel Corp., Cleveland; bids taken.

450 tons, state bridge, Mill Creek, Pa.; bids Nov. 20.

450 tons, Chase avenue subway, Milwaukee; bids Dec. 4.

400 tons, crane runway, Philadelphia, for United States Navy.

400 tons, asphalt plant, for New York, City, James P. Rice Building Co. Inc., New York, low.

400 tons, building, Calco Chemical Co., Bound Brook, N. J.; out for figuring.

350 tons, plant addition, for Rubberoid Co., St. Louis.

350 tons, opera house, Twenty-third street and Eighth avenue; bids Nov. 30.

300 tons, bridge over Colorado river, Parker, Ariz.

300 tons, loading platform, for Atlantic Refining Co., Point Breeze, Pa.

275 tons, Parker bridge, Yuma county, Arizona; bids opened.

250 tons, Gold avenue subway, Deming, N. Mex.

250 tons, turbine supports, for Cleveland Electric Illuminating Co., Ash-tabula, O.

250 tons, building, Weehawken, N. J., for Port of New York authority; bids Nov. 24.

240 tons, bridge over Saco river, Brown-field, Me.

220 tons, overhead bridge, Minot, N. Dak.

200 tons, grade elimination bridge, North Haven, Conn.

200 tons, extension to plant, Twin Coach Co., Kent, O.; bids taken.

150 tons, grade crossing elimination for Pennsylvania railroad, Woodbridge, N. J., at Leesville avenue; out for figuring.

130 tons, state bridge, Tunkhannock, Pa.; bids Nov. 20.

120 tons, extension to pipe shop, navy yard, Philadelphia; Belmont Iron Works, Philadelphia, low.

Unstated tonnage, 20 sets of gates and lining for Coulee dam project; bids to bureau of reclamation, Denver.

Unstated tonnage, municipal hangar, Billings, Mont.; bids in.

Unstated tonnage, section 7, Route 101, Sixth avenue subway, New York; bids Dec. 1.

Unstated tonnage, extension to Williams-burgh power plant, Brooklyn, N. Y.; Stone & Webster Engineering Corp., New York, general contractors.

Behind the Scenes with STEEL

Lube Stuff

MANY requests for good articles on lubrication of industrial equipment have been received from readers, according to word from our editors, but there has been some difficulty in lining up worthwhile discussions for publication in STEEL. However, this issue, page 38, contains a bang-up analysis of the effect of grooving on bearing lubrication.

Regardless of whether you have lubrication problems or not, it will pay you to read this article carefully. Go on now.

Bridge Cooler

THE monumental new San Francisco-Oakland bridge is causing quite a stir among Californians since its recent christening. It is a real tribute to man's ingenuity and the sturdiness of metals, awe-inspiring in its tremendous sweep, and a little terrifying in its majestic immobility.

But what interested us most about the bridge was to learn that on the span has been built a tabloid-size jail, approximating an oversize telephone booth, in which

unruly traffic violators will be clapped pending arrival of the "wagon" from headquarters. Sort of a penal substation, as it were.

Heads Together

HEADLINE of the week: "A Thief Stood on the Rolling Floor"—Fairbanks scales in the Nov. 9 issue of STEEL. For punch and rhythm, that line has what it takes. Not far behind was Morgan Construction Co.'s steamer: "An Industry Jumps for a Nickel." If you would like the two combined, try this:

*A thief stood on the rolling floor,
An industry jumps for a nickel;
The thug grabbed the slug and
made for the door
What a pickle!*

Of course, that has its rough spots, but after all we're no poet laureate.

And speaking of headlines, John Caldwell of our New York office thinks we ought to do something about Truscon Steel Co.'s line in the Nov. 16 issue. "Truscon's Land of Profanity." Well, John, all we can say is that we think it is simply swellificent.

SHIRDLU



HERE is a portion of the recently re-equipped composing room of the Penton Press Co. where the final forms of STEEL are "put to bed" every Friday night. Makeup stones, chase racks, type and furniture cabinets are all-steel. It is unfortunate that all the handsome printers who are busy here every day were shooed away when this photo was shot.

Reinforcing

Reinforcing Bar Prices, Page 77

New York—New concrete bar projects which have come out within the past week are principally for small alterations or additions. Buyers are becoming increasingly desirous of prompt delivery, rather than reduction in price. Buyers and sellers continue to anticipate a substantial increase in mill prices for the first quarter, consequently prices being quoted are nearer base than in the recent past.

Pittsburgh—Depending upon the

Concrete Awards Compared

	Tons
Week ended Nov. 20.....	2,706
Week ended Nov. 13.....	2,702
Week ended Nov. 6.....	5,678
This week, 1935.....	4,935
Weekly average, 1935.....	6,862
Weekly average, 1936.....	6,256
Weekly average, October...	3,728
Total to date, 1935.....	330,859
Total to date, 1936.....	294,051

exact amount of 1-inch and 1½-inch square reinforcing bars ordered, Laclede Steel Co., St. Louis, is apparently low on rail bars and Tennessee Coal, Iron & Railroad Co. is low on new billet bars on a 6200-ton opening by the Tennessee Valley authority, Nov. 17.

Cleveland—Market here continues quiet with individual jobs averaging well under 100 tons. However, mills are operating at a good rate, in clearing up old business. Nothing further has been reported on sewage disposal contract No. 93, this city. Prices are unchanged, but there has not been enough heavy tonnage to offer a real test.

Chicago—While several fairly large tonnages of concrete bars are pending, new business is principally of small lots. Mill backlogs are declining, but, coupled with prospective orders, appear sufficient to maintain heavy production during the remainder of the quarter. Shipments, while lighter than during early fall, still are substantial.

San Francisco—Awards of reinforcing bars continue to involve fairly good sized aggregates which totaled 3250 tons. This brought the year's bookings to date to 221,806 tons, compared with 197,597 tons for the same period a year ago. Concrete Engineering Co. took 1750 tons for the University Mound reservoir, San Francisco.

Seattle—Local mills are working on backlogs, but new projects are few and tonnages unimportant. Awards in small lots of 20 to 50 tons for private construction are fairly numerous while state highway jobs in Washington and Oregon are furnishing some tonnages. Prospects are slim for the balance of the year although there are indications of increased building by private capital, principally industrial, early in 1937 which will stimulate demand for reinforcing materials.

Reinforcing Steel Awards

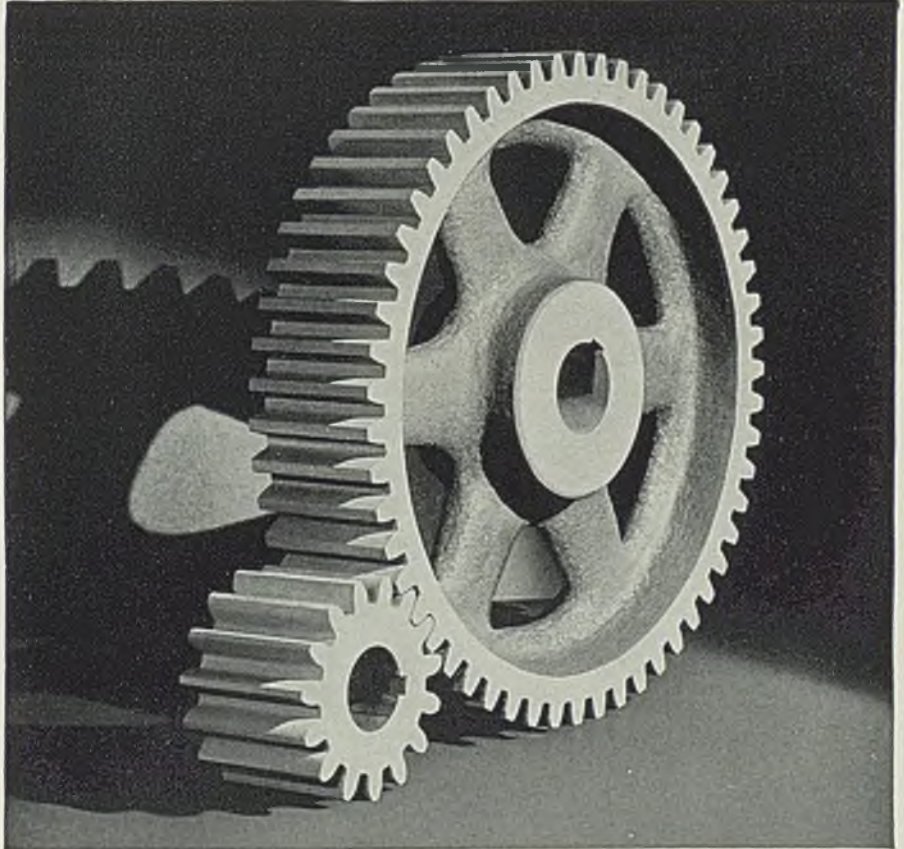
- 1750 tons, University Mound reservoir, San Francisco, to Concrete Engineering Co., San Francisco.
- 385 tons, specification 171, metropolitan water district, Los Angeles, to unnamed interest.
- 295 tons, addition to Ford Motor Co., Somerville, Mass., to Truscon Steel Co., Youngstown, O.
- 158 tons, highway work in San Diego county, California, for state, to unnamed interest.
- 118 tons, superstructures for Pier No. 9 and 19, San Francisco, to Concrete Engineering Co., San Francisco.

Reinforcing Steel Pending

- 6200 tons, comprised of 4200 tons of rail steel bars and 2000 tons of new billet bars; bids received by Tennessee Valley authority, Nashville, Tenn., Nov. 17, from Laclede Steel Co., Tennessee Coal, Iron & Railroad Co., and Truscon Steel Co.

- 1525 tons, Birds Island sewage project, for Buffalo Sewer authority; bids due Dec. 8, includes 450 tons of steel sheeting.
- 1312 tons, flood control work, Haverhill, Mass.; bids to Boston engineers received Nov. 21.
- 1000 tons, vocational school, Toledo, O.
- 400 tons, sections 10-A, 11-A, route 40, New Jersey state paving; Fred McDowell, Neptune, N. J., low.
- 300 tons, bridge, in Queens county, New York; bids Nov. 24.
- 225 tons, addition to American Smelting & Refining Co. plant, Selby, Calif.; bids being taken.
- 200 tons, asphalt plant, for city of New York; James P. Rice Building Co. Inc., New York, low on general contract.

- 150 tons, Division street bridge, Watertown, Wis.; bids Nov. 27.
- 150 tons, Bills Brook dam, Barkhamsted, Conn.; board of contract and supply, Hartford, Conn., receiving tentative estimates.
- 135 tons, viaduct, Sacramento, Calif.; bids Nov. 27.
- 130 tons, Chase avenue subway, Milwaukee; bids Dec. 4.
- 115 tons, bridge, Dutchess county, New York; bids Nov. 24.
- 103 tons, Brunswick Laundry, Jersey City, N. J.; James Mitchell Co. Inc., Jersey City, general contractor.
- Unstated tonnage, sewage treatment work, Queens, N. Y., at Tallman's Island, section 1, contract 1; bids Dec. 1, by department of sanitation.



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Pig Iron

Pig Iron Prices, Page 78

Pittsburgh—Pig iron has held without change through the entire year, the last advance having been made in December of 1935, when the market was raised to its present level of \$19, Pittsburgh district furnace, for basic iron, \$19.50 on foundry iron and \$20 for bessemer iron. Reopening of the American Steel Foundries Co. plant at Verona, Pa., in the Pittsburgh district, after an idleness of six years is expected within another month.

Cleveland — Sales this week dropped somewhat after the mild spurt reported the previous week, due to the \$1 ton advance on New England iron. Shipments continue at a high rate, showing an increase so far this month over the corresponding period in October. Producers' stocks have declined a little during the last 60 days. Not much activity is looked for in the present market until the expected new price policy has been announced.

Chicago—The upturn in pig iron shipments, amounting to 35 per cent so far in November as compared

with a month ago, is outstripping the increase in consumption. Anticipation of higher prices is prompting foundries to place additional iron in stock, and most consumers now are covered for at least the remainder of this quarter. Foundry operations also are rising. Machine tool builders are making heavy demands on foundries, delays in obtaining castings being given as a principal cause for deferred deliveries on finished tools.

New York—Pig iron buying is moderate, as most consumers have covered needs for remainder of year. Any definite announcement as to price advances for first quarter should stimulate further activity, with sellers anticipating first quarter needs more extensively than they have to date.

Philadelphia—While most pig iron consumers have anticipated requirements of the next several weeks rather fully because of the probability of an increase in prices, it is believed that definite announcement of the increase will cause further protective covering. Current consumption is well sustained.

Cincinnati—Shipments of pig iron, especially Southern, are expanding at a rate considerably better than

the improvement in melt, as foundries build up stocks against a price advance. Requirements for the remainder of the quarter are about covered but ordering continues as melters become convinced that the price will be raised and that the increase may exceed \$1 a ton.

St. Louis—Shipments of pig iron are running moderately above the high average attained in October, and new orders are also in considerable volume. While no definite announcements have been forthcoming, it is understood that an increase of \$1 per ton is imminent. New buying is based largely on the expectation of an upward revision. Melt is holding up well. Although there has been a slight recession in activities at stove foundries from the early November peak, operations will continue at an unusually high rate up to the Christmas holidays.

Birmingham, Ala.—Pig iron demand is strong, and shipments are active. Sloss-Sheffield Steel & Iron Co. will blow in one of its North Birmingham blast furnaces Nov. 27, giving that company three furnaces in operation for the first time in several years. Tennessee Coal, Iron & Railroad Co. will blow in another furnace by the end of the month.

Toronto, Ont.—Business continues steady in the merchant pig iron market. Current sales range from a car to 300 or 400 tons, and several of the larger melters have taken iron for needs to the close of the year. Forward delivery contract placing is at a standstill.



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Scrap

Scrap Prices, Page 79

Pittsburgh—Advances of 50 to 75 cents a ton in most grades of low phos scrap, which includes billet crops, steel wheels, punchings and heavy plate scrap, were made last week, based on a restricted supply following more active buying by electric furnace operators. This activity in a relatively unimportant grade of scrap, as compared with No. 1 steel, is in direct contrast to the latter, where such open-hearth grades as hydraulic compressed, machine turnings, and No. 1 heavy melting steel are quiet. Mills which have been offering to pay \$17 per ton, delivered, for No. 1 steel in this district have not found ready supplies, making the overall picture for the market not one of extreme weakness.

Cleveland—Steel and iron scrap is quiet but firm, with most buying in small lots. Blast furnace material has advanced about 50 cents and

a few special grades also show an upward tendency.

Chicago—Iron and steel scrap prices continue strong, though one mill has purchased a small tonnage of heavy melting steel at \$16.50, 25 cents below a previous sale. Dealers are forced to pay at least \$16.50 for this grade, but mills are offering no more than this figure on new commitments. While scrap is coming out in sufficient volume to meet contracts there is no surplus. Last cargoes of scrap to be shipped to eastern ports now are being loaded.

Boston—A slight weakness in brokers' buying prices on both domestic and export scrap was noted in the New England market last week, despite the fact that mills in Worcester and eastern Pennsylvania are gradually coming back in the market for additional commitments. The exception to the domestic price weakness is No. 1 machinery cast, which is now being quoted at \$10.75 to \$11.00. No. 1 heavy melting steel delivered at Boston docks for export is down 25 cents a ton to \$12.

New York—A slight increase in demand from mills at Pittsburgh for scrap was responsible for the stronger undertone in the market last week, although some prices on metal for domestic consumption were off to 50 cents a ton. No. 1 heavy melting steel for export also is weaker to 50 cents lower.

Philadelphia—No. 2 heavy melting steel is a shade easier at \$13.50 to \$13.75 with a fair sized tonnage closed by a nearby mill at the outside figure. Reductions are noted in several other grades, although in some railroad specialties increases have been made. Couplers and knuckles and rolled steel wheels are up and low phosphorus steel is quoted higher. New compressed sheets and cast iron wheels are slightly lower.

Buffalo—Scrap is dormant but dealers insist early tonnage activity in heavy melting steel is inevitable. The bid of \$16 for No. 1 heavy melting steel still attracts no tonnage but some dealers are reported to have taken contracts planning to ship such materials as machine shop turnings on \$6 differentials. Cast scrap continues to forge upward as the result of strong demand. Other grades are steady and the close of navigation, now rapidly approaching, should put local dealers in a strong position for the next five months.

Detroit—Nearby closing of the navigation season, in company with a much larger volume of automobile scrap is reflected in a weaker tone. Although local consumption is at a relatively unchanged pace, the aforementioned depressing factors likely will combine to make prices quot-

ably weaker within a week. Currently No. 1 steel at \$13.50 to \$14, hydraulic compressed at \$14 to \$14.50, and blast furnace material at \$9.25 to \$9.75 are weak but quotably unchanged.

Cincinnati—The iron and steel scrap market here is strong because of dealer optimism and desire to bolster stocks, underlying factors being high steelworks operations and prospects of an increase in pig iron. Quotations remain unchanged on basis of tonnage sales in the last fortnight, placed through several

brokers, and on basis of bids for material on the Louisville & Nashville railroad list which comes to this district. Most of the list went to western and up-river points.

St. Louis—Demand for iron and steel scrap continues strong and under stimulus of scarcity and a large outstanding short interest, prices on a number of important items were advanced 25 to 50 cents per ton.

Local mills are seeking scrap and are willing to take on sizeable tonnages. In addition inquiries from outside points are in heavy volume.

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One leading seller said he could place 25,000 tons of steel among his customers were it available.

Birmingham, Ala.—While the iron and steel scrap market shows no material change dealers are giving close attention to demands and are still able to deliver promptly. Quotations are steady. Dealers apparently have considerable stock available. Larger consumers are still in the market from time to time and buying for immediate delivery. Heavy melting steel holds at \$11 to \$13.

Seattle—The market is slightly weaker, due to lack of trans-Pacific transportation and scarcity of orders from Japan. Some scrap is being exported through Vancouver, B. C., where shipping is active. Mills are buying but have forced down prices 25 to 50 cents. No. 1 scrap is now quoted at \$10.50 to \$10.75.

Toronto, Ont.—Trading in iron and steel scrap shows increased volume. Consumers are buying more frequently and in larger tonnages. Current demand is chiefly for steel grades and both Toronto and Montreal dealers report heavy shipments of heavy melting steel and

other lines. Foundries are buying in lots up to 300 tons.

Warehouse

Warehouse Prices, Page 80

Pittsburgh—Several attractive lots of plain shapes and bars were bid Nov. 13 to the state highway department, Harrisburg, Pa., finding John H. Wickersham, Lancaster, Pa., low on Juniata county work taking 50 tons of plain bars and 4 tons of plain structural; F. O. Bortz, Mercer, Pa., low on Mercer county work taking 9 tons of plain structural; and Charles H. Fry Construction Co., Erie, Pa., low on Warren county work taking 49 tons of plain shapes.

Cleveland—Sales so far this month compare favorably with October, in spite of the fact that mill deliveries on some products have shown considerable improvement. Requirements for bars and sheets are most active. This is emphasized more clearly by the slight decline in structural lettings. Prices remain firm.

Chicago—Sales have been well sustained so far this month at close

to the October rate. Possibility of higher prices is regarded as a minor factor in current demand but is thought likely to help sustain business later in the quarter.

New York—Demand last week for sheets was comparatively quiet, although demand for other light types of steel remained on the same level as during the previous week. In some instances, warehouse supplies on certain sizes have been depleted by heavy orders, a number of them coming from manufacturers of automobile parts and accessories.

Philadelphia—Warehouse business is well sustained, although the price situation is unsettled in soft steel bars and small angles, due largely to offerings of foreign steel in the more popular sizes at concessions of several dollars a ton.

Cincinnati—Warehouse sales are holding to the higher level established shortly after the election, comparable to October trade. Only small lots of building materials are moving. Sheets and other items on which mill deliveries are retarded are active.

St. Louis—Warehousemen report spottiness in current trade, but volume thus far in November compares favorably with peak levels for the year reached in October. Cold finished steel is moving actively, and steady expansion continues in sales of stainless steel. Seasonal items, such as boiler tubes, and materials for furnace repairs, are in good demand. Outstanding has been the heavy purchasing of a variety of items by the adjacent coal mines.

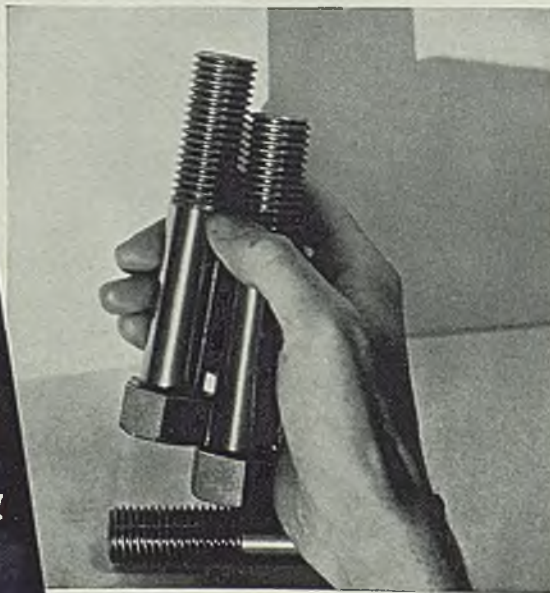
Seattle—Business continues in fair volume, although interruption of water service is retarding sales. Sheets are leading out-of-stock items, while light plates also are in good demand. Prices are unchanged.

Metallurgical Coke

Coke Prices, Page 77

Lemont Coal & Coke Co., Uniontown, Pa., placed 55 additional beehive coke ovens in operation last week at its Continental No. 1 and Lemont No. 2 plants, now having 525 ovens in production. Another group of beehive coke ovens which resumed last week was the Atlantic Crushed Coke Co.'s Derry, Pa., beehive coke plant which is now scheduling operations in 40 beehive ovens. Latest count indicates that close to 3000 beehive coke ovens in the Western Pennsylvania district are on schedule and that only about 1000 more, which make a total of about 4000 all told, could be placed in operation. Many of these thousands, however, would require considerable expense on repairs. Many other thousands of ovens, due

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to long idleness, have definitely been written off by their former operators as many of them had not operated in over ten years and are in ruins.

Demand for coke is increasing and shipments are heavier in all consuming centers, with production increased wherever possible.

Tin Plate

Tin Plate Prices, Page 76

Pittsburgh—The price on tin plate has been extended virtually unchanged for 1937 contracts. A leading producer last week announced its price, effective Jan. 1, would be \$4.85 per base box, Pittsburgh, and \$4.95, Gary, Ind., plus transportation charges in effect at the time of shipment. The market in 1936 had been \$5.25, Pittsburgh, and \$5.35, Gary, less a 7½ per cent discount for quantities, which had been in effect since the steel code, a net of \$4.85625 per box. At the same time, the customary 7½ per cent discount on light coated manufacturing ternes will also be dropped for 1937 and base prices will be \$4.15 per base box, Pittsburgh, and \$4.25 per base box, Gary. Tin plate mills at 90-95 per cent production last week had about two weeks ahead on hot mills and less in cold reduction units.

Cold Finished

Cold Finished Prices, Page 77

Pittsburgh—Following first quarter price announcement on hot-rolled merchant steel bars last week, producers of cold-finished carbon bars may be expected this week to name their selling levels for that period. For delivery over the balance of the present quarter, 2.35c, f.o.b. Pittsburgh, is recognized as the going market, but an advance from this level likely will be taken, the important detail remaining the extent of such a prospective markup.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 77

Bolt, nut and rivet demand is well sustained, though requirements of freight car builders in some instances are lighter. In view of the favorable outlook for additional buying of railroad equipment, no sustained lull is anticipated in bolt, nut and rivet consumption for freight car building. Tractor manufacturers hold operations near a peak rate and demand from farm implement builders is steady or heavier. Structural fabricators are taking

smaller lots of rivets. Bolt and nut prices continue easy, while rivet quotations are steady.

Ferroalloys

Ferroalloy Prices, Page 78

New York—A stronger market abroad is contributing to a firmer market here on ferromanganese. While the domestic price is unchanged at \$75, duty paid, Atlantic and Gulf ports, a higher price for first quarter is now regarded by most trade interests as likely. Domestic demand is strong with the outlook for the winter months promising, and the inherent strength thus engendered is being made all the stronger by the situation abroad, which also includes advancing prices on manganese ore.

The foreign market on ferromanganese has now reached a point, it is said, where little new business can be accepted for shipment here with the domestic market at its present level. Arrivals are still being noted along the eastern seaboard, particularly at Baltimore, and only recently a fair tonnage came in at Philadelphia, however, these shipments, it is believed, are against old contracts.

Domestic spiegeleisen, 19 to 21

per cent, is strong, with lots under 50 tons holding at \$26, Palmerton, Pa., and 50 tons and over at \$24.

Consumption of ferromanganese in the Pittsburgh district is holding around the high level established through October, contributed to chiefly by a high rate of local ingot production. Shipments to consumers outside of the Pittsburgh district are also at a heavy rate. A leading seller of ferromanganese reports its weekly bookings running as much as 600 to 700 tons. The market is quoted \$75, duty paid, tidewater, or \$80.13, delivered to the Pittsburgh district.

Steel in Europe

Foreign Steel Prices, Page 80

London — (By Radio) — Foreign trade of Great Britain in October assumed a better relation of incoming and outgoing steel and iron products. Exports rose to 194,360 gross tons, a gain of 11,337 tons over September. At the same time imports declined to 101,032 tons, which was 64,305 tons less than the September total.

All available pig iron production has been reserved for domestic consumers and practically the entire



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output to the end of 1936 has been sold. Steelworks are operating to capacity, additional capacity being lighted wherever available, and imports of semifinished steel are being increased to meet requirements of rerollers. Demand for finished steel, including exports, is heavy.

Continental markets are firm and export trade is active, particularly to South America and the Far East.

Coke By-Products

Coke By-Product Prices, Page 77

New York—A tight situation has developed in the market for toluol and industrial xylol, present demand exceeding current supply. Following the customary practice, it is expected that the price of sulphate of ammonia will be boosted 50 cents to \$26 a ton around the first of December. Demand for naphthalene flakes and balls is unchanged.

Nonferrous Metals

Nonferrous Metal Prices, Page 78

New York—Consumer buying in the copper, lead and zinc markets tapered last week following heavy demand during the previous few weeks. Activity in the market price-wise was confined to \$2 per ton advances in lead and zinc and to sharp gyrations in tin.

Copper—Interests in the copper market centered their attention on the resumption of the upward swing in foreign prices. Export copper advanced from around 10.45c to

10.75c, c.i.f. This movement will threaten domestic levels if continued and has already tightened the domestic scrap metal supply situation. Buying here was light with prices firm at 10.50c, Connecticut, for electrolytic.

Lead—Prices advanced \$2 per ton further to 5.05c, East St. Louis, and 5.20c, New York, with St. Joseph Lead Co. asking \$1 premium on its brands in the latter market. The market maintains a strong position despite lighter demand as sellers are reluctant to dip into surplus stocks.

Zinc—Most sellers are well sold ahead and in some cases are oversold. Available supplies are limited, therefore, on the current basis of 5.05c, East St. Louis, for prime western. This level was attained on Nov. 17 and likely will be lifted further on any substantial increase in

Tin—Domestic prices were under importers' levels most of the week. Consumers generally are awaiting lower levels before buying actively. Straits spot closed around 51.25c compared with 52.50c at the end of the previous week.

Antimony—Buying continued light with prices unchanged at 12.50c, duty paid New York, for Chinese spot and 12.25c, New York, in cases for American spot.

Semifinished

Semifinished Prices, Page 72

For the fourth consecutive week bookings of sheet bars by Pittsburgh district producers have shown

improvement. The continued heavy requirements of Ford Motor Co. have been an outstanding market feature, and many of the nonintegrated sheet and strip mills have been entering specifications against the first-quarter advance.

Iron Ore

Iron Ore Prices, Page 79

Cleveland—Unfavorable weather conditions this month, played an important part in delaying shipments from upper lake ports. A conservative estimate for November is now 3,000,000 tons. This year's total — approximately 44,000,000 — will exceed any year since 1930, when close to 47,000,000 tons were brought down.

Unless weather conditions show a marked improvement, the season will close about Dec. 1. Boats are now being taken out of service.

Following is the Lake Superior Iron Ore association's current report:

	Tons
Consumed in September	4,026,690
Consumed in October	4,384,809
Increase in October	358,119
Consumed in October, 1935	2,910,863
On hand at furnaces, Nov. 1 ..	30,376,560
On Lake Erie docks Nov. 1 ..	4,779,539
Total on hand at furnaces and Lake Erie docks, Nov. 1	35,156,099
Reserve total, Nov. 1, 1935 ..	35,115,014

Receipts of iron ore at lower lake ports for this season to Nov. 1, shipments to interior furnaces, and dock balances follow:

Port	Receipts	Shipments	Dock bal. Nov. 1, '36
Buffalo ...	3,126,844	5,735	2,323
Erie	1,476,777	1,482,772	57,441
Conneaut ..	6,109,369	6,006,465	1,712,078
Ashtabula ..	4,169,634	4,075,199	1,776,573
Fairport ...	837,422	843,242	387,085
Cleveland ..	8,217,685	6,572,673	514,892
Lorain	2,346,461	1,113,325	23,523
Huron	657,895	715,628	277,920
Toledo	1,355,079	742,160	27,704
Total	28,297,166	21,557,199	4,779,539
Year ago ..	18,418,219	12,989,629	5,358,668

Receipts at other than Lake Erie ports for October and the current season to Nov. 1 follow:

Port	Receipts in Oct.	Season to Nov. 1
Detroit	214,709	1,315,020
Indiana Harbor	306,589	1,927,319
Gary	397,976	2,884,050
So. Chicago (loc. fees.) ..	1,005,575	4,751,299
Hamilton, Ont.	68,266	399,666
Total	1,993,115	11,394,375
Year ago	1,453,184	7,578,303

Refractories

Refractories Prices, Page 78

Activity of open-hearth furnaces is demonstrated by demand for



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Arc-Welding Electrodes

for welding all corrosion and heat resisting products. Send for data book.



MAURATH INC

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silica brick for relining and other repairs. Makers of silica brick are now three months behind in deliveries. A year ago their backlogs were only six weeks.

Tool Steel Prices Are Up \$20 to \$50 Per Ton

Leading makers of tool steels have announced price advances on their various grades, effective Jan. 1. These advances range upward from \$20 a ton on carbon tool steels to \$50 a ton on high-speed tool steels.

High-speed tool steels, the base for which formerly was 57½ cents per pound, now are announced as 60 cents per pound as of Jan. 1, a rise of \$50 a ton.

Hot-worked tool steels, formerly sold at 44 cents a pound, will be 46 cents a pound, an advance of \$40 a ton.

Carbon tool steels of the highest grade, which formerly brought 19 cents a pound, will be 20 cents a pound in the new schedule, a rise of \$20 a ton.

Changes in prices of alloy steels are said to be unlikely to become effective until Feb. 1. So far no announcement has been made affecting the prices of stainless steels.

New Designations for Ludlum Stainless Steels

Effective immediately, Ludlum Steel Co., Watervliet, N. Y., is changing the grade designations of part of its chrome nickel Silcrome series so that in the future its stainless grades will be designated by numbers indicating as closely as possible their composition.

The following changes have been announced:

Old Designation	New Designation
Silcrome KA2	Silcrome 18-8
Silcrome KA2-S	Silcrome 18-8-S
Silcrome KA2-T	Silcrome 18-8-T
Silcrome KA2-C	Silcrome 18-8-C
Silcrome KA2-MS	Silcrome 18-8-M
Silcrome KA2-EZ	Silcrome 18-8-EZ

Designations of other grades remain unchanged.

Pig Iron, Ore Imported

Philadelphia—A substantial tonnage of ore and pig iron arrived here during the week ended Nov. 14. Included were 1155 tons of pig iron from the Netherlands and 652 tons from British India. Ore arrivals comprised 2029 tons of chrome ore from the Philippine islands and 2205 tons from Ceylon.

Also to arrive here were 250 tons of ferromanganese from Poland and 98 tons from the Netherlands. Finished steel importations comprised 149 tons of structural shapes, 111 tons of steel bars, eight tons of steel bands and three tons of baling wire, all from Belgium; five tons of structural shapes from France and four tons of steel billets, two tons of steel forgings, 65 tons of steel tubes, 29 tons of cold drawn steel wire and 10 tons of steel bars, all from Sweden.

Activities of Steel Users and Makers

PARTOOL MACHINE CO., Detroit, has recently been incorporated to build special machinery for the automotive industry, specializing in custom built drilling machines. The company, an affiliate of the Sterling French Machinery Co., Detroit, is now awarding contracts for a one-story building 90 x 150 feet, which will be built with a 40-foot craneway. An order for a 10-ton traveling crane has been placed with the Northern Engineering Corp. Officers of the company are Charles E. French, president, David Forsman, sales manager, and Max Clark, works manager.

Dura Co., manufacturer of automotive hardware, has been acquired by the Detroit Harvester Co., Detroit, maker of tractor parts and

farm implements. The latter company has purchased all of the preferred stock of Dura and 60 per cent of the common stock. The Detroit-Dura Co., with stated capital of \$1,500,000, will be the resulting name from the merger. Harry L. Pierson, of Detroit, is to be president of the new company.

Leeds & Northrup Co., Philadelphia, has opened a new branch office at 804 Judd building, Hartford, Conn.

Columbia Tool Steel Co., Chicago, will move its branch office and warehouse at 169 South Second street, Milwaukee, to 441 North Sixth street, about Dec. 15. Carl F. Scheid is district sales manager at Milwaukee.


Stearns Magnetic Mfg. Co., Milwaukee, maker of separators, clutches, brakes, suspension and safety magnets and other magnetic devices, has opened a sales office at 369 Architects building, Philadelphia, with James Whiting in charge.

Rotor Air Tool Co., 5704 Carnegie avenue, Cleveland, maker of grinders, buffers, sanders and drills, will be located at 17325 Euclid avenue, Cleveland, after Dec. 1. The new location will afford the company better facilities for both research and manufacturing.

John Deere Plow Co., Syracuse, N. Y., has bought the buildings at Syracuse formerly occupied by the Syracuse Chilled Plow Co. and will

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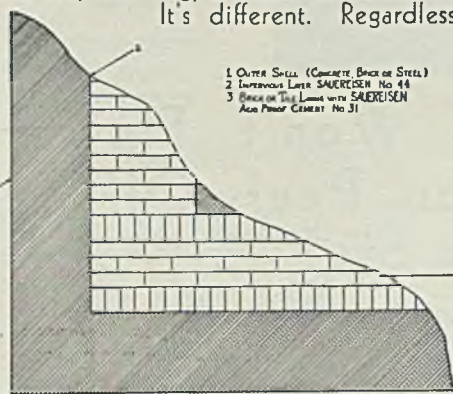
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1 Outer Shell (Concrete, Brick or Steel)
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expand its plant to occupy the 125,000 square feet thus made available. The buildings will be remodeled. William M. Choguill is vice president and general manager.

Michigan Leather Packing Co., maker of mechanical leather packings for hydraulic and pneumatic machinery, has moved from 750 Fourteenth avenue, Detroit, to a new plant at 6301 East Lafayette avenue.

Symington Co., Rochester, N. Y., has changed its corporate name to the Symington-Gould Corp. and has acquired the entire capital stock of the Gould Coupler Corp. No change is contemplated in the policies, management or business operations of either company.

Union Pacific has specified Timken roller bearings and boxes for all driving axles of the 20 steam passenger locomotives ordered recently from American Locomotive Co., New York.

Chapman Transmission Corp., successor to the Transmission Ball Bearing Co., Buffalo, manufacturer of anti-friction bearings and mountings, has appointed George P. Dempler Co., Pittsburgh, as its representative in the Pittsburgh district.

Newark Wire Cloth Co., Newark, N. J., manufacturer of woven wire screens and wire cloth products, has appointed Harry G. Mouat, Martin building, Birmingham, Ala., to represent it in the Birmingham territory,

and W. C. Myers & Co., 8 North Cheyenne street, Tulsa, Okla., to represent it in the Tulsa territory. The Pittsburgh office of the company has been discontinued.

Inform-A-Show Features Iron and Steel Products

More than 80 exhibits, including steel and other metal products, featured the ninth annual "Inform-A-Show," sponsored by the Cleveland Purchasing Agents association, Cleveland, last week. Exhibits were larger and more elaborate than in recent years. Among the exhibitors were:

C. O. Bartlett & Snow Co., Bettcher Mfg. Corp., Betz-Pierce Co., W. Bingham Co., Bissett Steel Co., Cleveland Tool & Supply Co., Cuyahoga Spring Co., Eaton Mfg. Co., Federal Gear Inc., Forest City Foundries Co., Fulton Foundry & Machine Co. Inc., Frank H. Grace & Co., Hamilton Steel Co., Johnston & Jennings Co., Lake City Malleable Co., Manufacturers Supply Co., Master Products Co., Ohio Ball Bearing Co., W. M. Pattison Supply Co., Peninsular Steel Co., Reliable Steel Plate Co., Strong, Carlisle & Hammond Co., Universal Valve & Fittings Co., Edgar T. Ward's Sons Co., Welding Equipment & Supply Co., White Tool & Supply Co., Williams & Co. Inc., George Worthington Co., all of Cleveland, and Youngstown Sheet & Tube Co., Youngstown; Ridge Tool Co., Elyria; Parker-Kalon Corp., New York.

Pittsburgh Purchasers Pick Best Steel Displays

The Pittsburgh Purchasing Agents' association has announced the following awards for excellence

in exhibits at its recent convention: In the service division, the Standard Machinists Supply Co. booth was judged the most informative, and Columbia Steel & Shafting Co.'s display the most attractive.

In the industrial division, Jones & Laughlin Steel Corp.'s display was judged the most informative, and Mesta Machine Co.'s booth the most attractive. This marks the second consecutive year Mesta's exhibit has been so honored.

Granite City Tin Plate Output Up 20 Per Cent

"Production of tin plate by the Granite City Steel Co. during the present year," says Hayward Niedringhaus, president, "will be approximately 20 per cent greater than during 1935. Last year our mill produced enough tin plate to make more than 380,000,000 tin cans. This year we will produce an amount sufficient to make about 570,000,000 cans.

"Since 1890 the tin plate industry in the United States has developed from virtually nothing to the point where American mills last year produced tin plate with a total value of \$180,000,000."

Equipment

Chicago—Machine tool sales so far this month are ahead of the October rate which marked the peak level for the year to date. Deferred deliveries on most tools are stimulating the prompt closing on inquiries, particularly for those items which are required for 1937 expansion programs. While an occasional rush order is appearing from railroads, new buying is light despite the increase in inquiries being issued for 1937 budget-making purposes. Farm equipment companies have closed on most of recent inquiries but some additional buying is in prospect. Gellman Mfg. Co., Rock Island, Ill., will spend \$45,000 for machinery for a new machine shop addition. Improvement is lacking in deliveries of larger machine tools, but on smaller tools, manufacturers have been able to increase their production sufficiently to give relatively prompt shipment. Lack of skilled help still is a factor responsible for production delays.

Seattle—Business has slowed, due to seasonal conditions and the situation has been aggravated by the interruption of water services so that some lines are running short. Strike of maritime workers has closed logging camps and lumber mills and equipment dealers are feeling the effects.



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Construction and Enterprise

Michigan

CHELSEA, MICH. — Village will take bids soon for construction of sewage treatment plant, including primary settling tanks, filter or aeration tanks, digestion tank and sludge bed. Cost is estimated at \$54,000. George W. Champe & Associates, 1025 Nicholas building, Toledo, are engineers.

DETROIT — Harry W. Dietert Co., 676 West Grand boulevard, is building 60 x 90-foot modern plant at 9330 Rose-lawn avenue. Expenditures are also being made for improved manufacturing facilities and in the research laboratories of the company. Expansion to be completed by Dec. 1.

DETROIT—Nilson Tool Mfg. Co., 4933 Elmhurst, will erect factory on Schaeffer road at a cost of \$12,000. Adler Contracting Co., 10 Parkhurst, is contractor.

DETROIT—Fostoria Machine Products Corp., 1863 Union Guardian building, has been incorporated by F. B. Hall, 1109 Hippodrome building, Cleveland, to engage in a general manufacturing and machine shop business.

ECORSE, MICH. — Bowen Products Corp. will erect factory building here, one and two stories, 440 x 240 feet. Christian W. Brandt, 421 West Larned, Detroit, is architect.

GLADSTONE, MICH. — City plans construction of municipal power plant. Bonds for \$100,000 have been issued to finance the project. Shoecraft, Drury & McNamee, Ann Arbor, are consulting engineers. (Noted Oct. 26).

GRAND BLANC, MICH.—Plans for construction of \$50,000 waterworks system are being completed by Ora F. Gould, 522 Dryden building, Flint, who is engineer.

GRAND RAPIDS, MICH.—Armour & Co., 316 South LaSalle street, Chicago, has awarded contract for construction of \$50,000 sausage manufacturing plant to Owen-Ames-Kimball Co.

GRAND HAVEN, MICH.—Wolverine Pressed Steel Co. has been incorporated here by Richard C. Luce, Spring Lake, to engage in stamping, die making and tool making.

KALAMAZOO, MICH. — Paper Makers Chemical Corp., Riverview drive, plans construction of power house at plant in Elroy, Wis., as part of a project estimated to cost \$100,000. Donald Whalen is engineer.

KALAMAZOO, MICH.—Dickens Freight Co. have plans nearing completion for construction of warehouse. Leroy & Newlander, 122 Pratt building, are architects.

KALAMAZOO, MICH. — Humphrey Heater Co., North Rose street, will construct additions and alterations to factory building.

LANSING, MICH.—City council has formally accepted PWA grant of \$405,000 for construction of municipal sewage and garbage disposal plant to cost \$900,000. Project will be completed by Jan. 11, 1938.

MUSKEGON, MICH.—Norge Corp. has started construction on replacements of plant sections destroyed by fire, at a cost of \$150,000. Strom Construction Co., 357 Houseman building, Grand Rapids, is contractor. (Noted Nov. 16.)

PONTIAC, MICH.—City commission has

been asked by special investigating committee to consider a recommendation for construction of municipal light plant.

Ohio

BEACH CITY, O.—Village voted in favor of bond issue to finance construction of sewage system at an estimated cost of over \$80,000. J. B. Hay is mayor; George A. Reese, Clark building, Canton, is consulting engineer.

CLEVELAND, O. — Republic Steel Corp. plans erection of continuous strip-sheet mill at a cost of about \$20,000,000. Cleveland is being considered as possible site, but final location is undetermined.

EDGERTON, O. — Village approved

fund of \$18,000 as its share of \$88,000 waterworks project. R. E. Buda is mayor; Carl Simon, Van Wert, O., is consulting engineer. (Noted Oct. 12.)

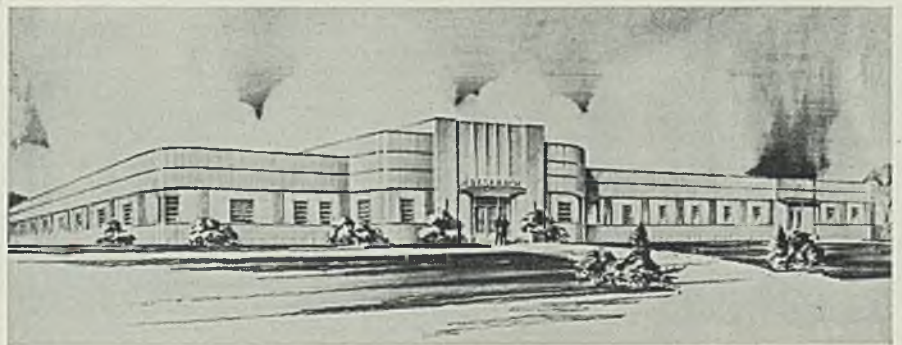
FINDLAY, O.—City council has been notified by state director of health to proceed with sewage plant extension program. Cost of project is estimated at \$125,000. Homer O. Dorsey is mayor.

GERMANTOWN, O. — Village plans construction of sanitary sewage system and disposal plant. Voters approved bond issue of \$30,000 for this purpose. Jennings-Lawrence Co., 12 North Third street, Columbus, is consulting engineer.

LEWISBURG, O. — Voters approved bond issue of \$15,000 to finance construction of sewage disposal plant estimated to cost \$60,000. Stellar Engineering Co., Dayton, is consulting engineer.

MARION, O. — Marion Rural Electric Co-operative Inc. is completing plans for construction of 255 miles power lines, to cost \$265,000. Carl Frye, Ohio Farm

Enameled Sheets, Stainless Steel in New Research Laboratory



FACILITIES for almost every type of metallurgical research and testing will be provided in the new research laboratory which the American Rolling Mill Co. plans to erect in Middletown, O., at a cost of \$260,000. (STEEL, Nov. 16, p. 27). Porcelain enamel, stainless steel, welded steel frame construction and glass block will be used extensively. The 41,900 square feet of floor space in the main part of the structure will be divided into more than 100 rooms



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Bureau, 620 East Broad street, Columbus, is engineer.

MASSILLON, O. — Eaton Mfg. Co., Reliance division, has let contracts at a cost of \$30,000 for erection of two additions to plant No. 1 on Harsh avenue S. E.

MIDDLETOWN, O. — American Rolling Mill Co. will erect modern research laboratory at a cost of approximately \$260,000. The structure will be one-story, welded steel frame construction, with a floor area of 41,900 square feet. Austin Co., Cleveland, has general contract.

MINERVA, O.—Board of public affairs, Margaret Wright, clerk, is completing plans for power plant improvements. Ralph Hadlow, 700 Prospect avenue, Cleveland, is consulting engineer.

NAPOLEON, O. — Village is preparing plans for construction of light plant improvements, including bay building addition and boiler unit. Plans are expected to mature early in January. Froelich & Emery, Second National Bank building, Toledo, are consulting engineers.

NEW BOSTON, O. — Village plans construction of pumping station and installation of two 35,000-g.p.m. electric pumps at an estimated cost of \$47,000. Bond issue for this purpose has been approved and WPA allotment secured. Douglas Bowling is mayor; Arthur Wall, county engineering staff, is engineer.

SUGAR GROVE, O. — Village approved bond issues of \$8500 for financing construction of sewers and sewage treatment plant. Walter Graf, Lancaster, is city engineer; C. A. Carr is mayor.

UNION CITY, O.-IND. — Village is having survey made for power plant project, to cost \$130,000. Voters approved bond issue to finance the project. Hoover & Montgomery, 916 Atlas building, Columbus, O., are consulting engineers on survey.

WAYNESVILLE, O. — Village will construct sewage disposal plant and system to cost \$89,000. Bond issue for village share, \$20,000, approved. Morton Shepard, Industries building, Dayton, is consulting engineer.

New York

NEW YORK — Stone & Webster Engineering Corp., 90 Broad street, James H. Manning, president, has general contract for construction of \$4,350,000 addition to Williamburg Power Plant Corp. Equipment will include two 25,000-horsepower turbine generators, two cold-fired boilers and auxiliary equipment.

NEW YORK — Superintendent of school buildings, board of education, Flatbush extension and Concord street, Brooklyn, will take bids until Dec. 2 for furnishing equipment, including small tools and other supplies, for various shops of New Dorp high school, New Dorp, Borough of Richmond; and for one Class 3 engine lathe, equipment and other small tools for Tottenville high school, Tottenville, Borough of Richmond.

NEW YORK — Empire Trust building, 580-586 Fifth avenue, is installing steam power plant, including two steam engines, two diesel engines and four 150-KW generators. Harry J. Smith is supervising engineer.

POUGHKEEPSIE, N. Y. — Dutchess Iron & Metal Co. Inc. has been formed by Russell, Jacobs & Brevoort, 53 Lincoln avenue, to deal in metals.

ROME, N. Y.—The metal mill at the

Riverdale, N. Y., plant of Revere Copper & Brass Co. Inc. suffered damage estimated at between \$500 and \$1000 due to an explosion. (Erratum Nov. 16).

UNION SPRINGS, N. Y.—Village will improve water supply system by construction of pump station, storage tank and pipe line from Cayuga Lake.

WARWICK, N. Y.—City is preparing preliminary plans for complete new water supply system. Cost is estimated at \$12,000.

Illinois

CHICAGO — Chicago Rawhide Mfg. Co., 1301 Elston avenue, is having plans drawn for proposed boiler house, 31 x 46 feet. Axel V. Tiesen, 5302 North Spaulding avenue, is architect.

CHICAGO — Judson Rubber Works, 4107 West Kinzie street, plans addition to boiler plant. Edward H. Nordlie, 4825 North California avenue, is architect.

CHICAGO — Harris Mfg. Co., 55 Court street, Cicero, has been organized by A. Harris and associates, to deal in wire and wire products. Lewis & Carons, Suite 1611 Field building, 135 South LaSalle street, are correspondents.

EDWARDSVILLE, ILL. — City has plans for construction of municipal power plant and distribution system to cost \$390,000. City's share of \$216,000 will be submitted to voters at special election.

MURPHYSBORO, ILL. — Plant of Egyptian Iron Works Co. was completely destroyed by fire Nov. 9.

Delaware

SEAFORD, DEL. — Seaford Light & Power Co., recently organized, affiliated with Fairbanks-Morse & Co., Chicago, plans construction of diesel-electric power plant, to cost \$180,000. Franchise for 20-year period has been secured.

Maryland

SPARROWS POINT, MD. — Bethlehem Steel Corp., Bethlehem, Pa., plans construction of \$35,000,000 strip-sheet mill here. Contract for machinery has been placed with Mesta Machine Co., Pittsburgh; for electrical equipment, with General Electric Co., Schenectady, N. Y.; and Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Indiana

TERRE HAUTE, IND. — Merchants Distilling Co. plans construction of power house with three boiler units, pumps and accessories as part of an expansion program estimated to cost \$250,000.

Georgia

ALBANY, GA. — Albany Mfg. Co., A. A. Blum, New Albany Hotel, will erect hosiery mill, one-story, 119 x 212 feet. Charles H. Blatchley, Drexel building, Philadelphia, is engineer.

ATLANTA, GA. — International Harvester Co. Inc., 606 South Michigan avenue, Chicago, receives bids at office of purchasing agent Nov. 30 for construction of building addition on Whitehall street S. W. Atlanta. Cost is estimated at \$35,000. (Noted Nov. 2).

ATLANTA, GA.—Edgewood Shoe Factories, 16 Yonge street S. E., will erect steel and brick plant at Moreland avenue and Carolina street. Robert & Co., Bona Allen building, are engineers.

BRUNSWICK, GA. — Brunswick Pulp & Paper Corp. has awarded general contract for construction of first unit of proposed plant here to Stone & Webster Engineering Corp., 90 Broad street,

New York. Estimated cost of unit is \$3,500,000.

MONROE, GA. — Walton Electrical association receives bids Dec. 8 for construction of rural distribution system, over 100 miles of lines, 400 meters, to be located in Walton and Morgan counties. W. I. Barrett is secretary-treasurer; J. B. McCrary Engineering Corp., 22 Marletta street building, is engineer.

Kentucky

CATLETTSBURG, KY. — United Collieries Co., Carew Tower building, Cincinnati, has awarded contract to Rust Engineering Co., Clark building, Pittsburgh, for constructing substructure to its coal loading dock on the Ohio river here.

LANCASTER, KY.—City will let contract soon for construction of \$80,000 sewage system and disposal plant.

LOUISVILLE, KY. — American Air Filter Co. Inc., 215 Central avenue, placed contract recently with Austin Co., Cleveland, for construction of plant addition.

LOUISVILLE, KY. — Kentucky Springs Distillery Co., 429 West Market street, plans construction of power plant as part of new multi-unit distillery at Fisherville. Cost of entire project is estimated at \$100,000. Walter C. Wagner, Breslin building, is engineer.

Louisiana

JACKSON, LA.—Town receives bids until Dec. 4 for construction of waterworks system, including east iron pipe, tank, elevated tower, reservoir, pump house and pump. Fund of \$41,000 is available. F. P. Joseph, Glenmora, La., is consulting engineer. (Noted Oct. 19.)

LAKE CHARLES, LA.—Swift & Co., Union Stock yards, Chicago, Ill., will construct packing plant on Old Spanish trail, five miles east of city. Contracts will be let soon.

SUNSET, LA. — Voters approved \$21,000 bond issue to finance construction of waterworks plant.

WINNSBORO, LA.—Town votes Dec. 1 on \$50,000 bonds for extension and improvements to waterworks system.

Mississippi

CLEVELAND, MISS.—City will install sewage disposal plant, including chlorinator, Imhoff tank, filtration and sludge beds. Cost is estimated at \$227,273. B. E. Dearmon, Clarksdale, is engineer.

ELLISVILLE, MISS.—City will improve waterworks system by construction of pump house, well, etc. S. L. Craft is engineer.

SHUQUALAK, MISS.—City will spend \$10,000 to improve water supply, including installation of pump house, pump and motor. Krouse & Brasfield, Kiddar building, Meridian, are architects.

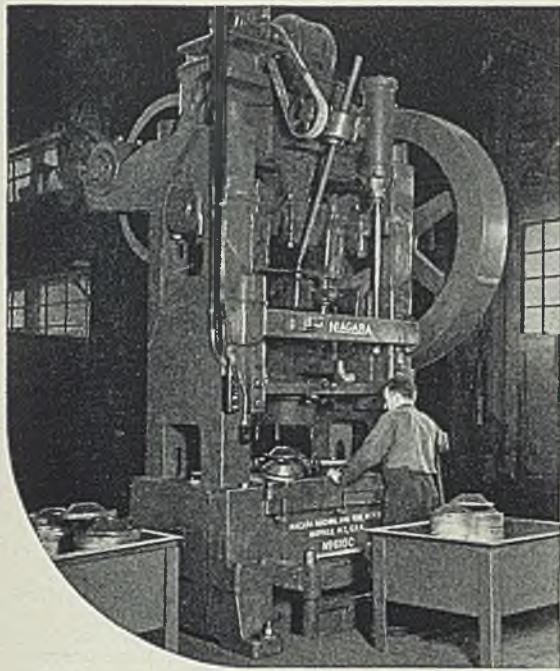
North Carolina

CHAPEL HILL, N. C.—City receives bids Nov. 25 for construction of sanitary sewer, pumping station and discharge line. J. M. Foushee is mayor.

CHAPEL HILL, N. C.—City has PWA grant of \$21,272 for construction of improvements, including sanitary sewers and pumping station, 2500 feet of cast iron pipe, and a 30-ton incinerator. A. R. Hollett is city engineer.

CHARLOTTE, N. C.—Piedmont Feed Mills Inc., Dunavant street, will erect addition to its plant and install new

(Please turn to Page 100)



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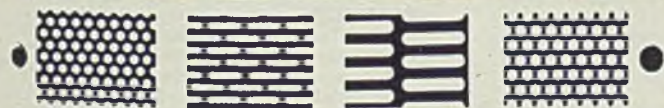


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to specifications.

Ample equipment for light and
heavy gears... Prompt delivery.

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(Concluded from Page 98)

machinery. Cost of building is estimated at \$10,000.

CHARLOTTE, N. C.—Duke Power Co. let contract to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for 75,000-horsepower turbo-generator as part of \$3,000,000 expansion program at Riverbend steam-electric power plant on the Catawba river near Mount Holly.

GREENVILLE, N. C.—Blount Fertilizer Co. will rebuild burned fertilizer plant at a cost of \$50,000. Modern equipment will be installed.

HIGH POINT, N. C. — City plans \$6,000,000 power project to control Yadkin river and provide power for locality. Project will include dam and power station consisting of six direct-connected vertical hydro-electric units, capacity 5570 horsepower each, with generator capacity rated at 4150 KW each. There will also be a substation of 24,500 kilowatts capacity. Grant of \$2,595,000 has been allotted city by PWA.

Tennessee

CLEVELAND, TENN.—Dixie Foundry Co. plans \$100,000 expansion program, including construction of two buildings.

CLEVELAND, TENN.—Brown Stove Works Inc. plans erection of glass and steel warehouse fronting Southern railroad. Cost is estimated at \$30,000.

KNOXVILLE, TENN. — University of Tennessee plans installation of power plant. Fund of \$54,000 is available. Ford L. Wilkinson, Knoxville, is consulting engineer.

MEMPHIS, TENN.—Memphis Butchers association has begun work on slaughterhouse at Riverside and Rhode Island streets. Cost of building is estimated at \$75,000; of equipment, \$40,000. Fred J. Sexton Co., 108-10 Dermon building, Memphis, has general contract.

WINCHESTER, TENN.—City voted to ratify \$75,000 bond issue to erect two-story fireproof factory building with 60,000 square feet of floor space.

West Virginia

CHARLESTON, W. VA. — West Virginia Water Service Co., Peoples Exchange Bank building, will construct 3,000,000-gallon elevated reservoir at Vandalla, to supply Charleston district. Bethlehem Steel Co., Bethlehem, Pa., has contract. Cost is estimated at \$1,000,000.

WEIRTON, W. VA. — Weirton Steel Co. suffered a loss of \$10,000 when its cold tin mill was damaged by fire recently.

WHEELING, W. VA.—Baltimore & Ohio railroad plans erection of \$100,000 cold storage warehouse at Water and Twentieth streets.

Oklahoma

OKLAHOMA CITY, OKLA. — All Steel Coach & Trailer Corp. has been formed here by Ernest E. Radford, 107 North Broadway, and F. L. Radford.

PONCA, OKLA. — City votes Dec. 1 on bond issue of \$175,000 to finance construction of proposed power plant.

Arkansas

BENTON, ARK.—City voted in favor of bond issue of \$21,000 to finance proposed waterworks improvements estimated to cost \$39,000. McGeorge Construction Co., Pine Bluff, is general contractor; R. E. Williams, Southern building, Little Rock, is engineer.

LITTLE ROCK, ARK.—Arkansas Power & Light Co., Pine Bluff, plans to in-

crease capacity of central power station by installing turbines, boilers, switches and other equipment. Cost is estimated at \$500,000.

PARIS, ARK. — Paris Purity Coal Co. suffered loss estimated at \$40,000 when tippie of Grand No. 3 mine was damaged by fire recently.

Texas

CORPUS CHRISTI, TEX. — Hanlon-Buchanan Inc., Tulsa, Okla., plans construction of gasoline blending plant, including steam power house. Cost is estimated at \$100,000.

GRANGER, TEX. — State council of rural electrification, Ralph Moore, chairman, plans construction of rural electric power transmission systems at an estimated cost of \$1,000,000.

HARLINGEN, TEX. — Apache Packing Co. has leased cold storage plant of Central Power & Light Co. and will remodel. James Patterson is plant superintendent.

HARLINGEN, TEX. — Fidelity Products Co., Brownsville, has acquired site on Valley Fair boulevard for construction of cottonseed oil mill. It is planned to start work in 60 days.

HARLINGEN, TEX. — Inco Packing Co., Coffeyville, Kans., will erect two-story meat packing plant here at an estimated cost of \$40,000. E. P. Kinzie and Earl H. McCune, Coffeyville, Kans., are interested in the company.

HOUSTON, TEX. — Humble Oil & Refining Co., Humble building, is clearing site for gasoline extraction plant in Tomball oil field near here.

Wisconsin

MILWAUKEE — Ford Motor Co., Detroit, is re-equipping Milwaukee assembly plant to resume operations Jan. 1. W. E. Simons is branch manager.

MILWAUKEE — State public service commission has approved plans for \$80,000 municipal pumping plant at Wauwatosa, as PWA project. H. T. Whipp is city clerk.

MILWAUKEE — Joseph Schlitz Brewing Co., West Galena street, plans extensions and improvements to power plant on West Cherry street, at a cost of \$75,000.

WAUKESHA, WIS. — Hein-Werner Motor Parts Co., maker of hydraulic jacks, water pumps and auto parts, will erect machine shop addition, 13,000 square feet, at a cost of about \$25,000.

Minnesota

MINNEAPOLIS — Land O' Lakes Creameries Inc., 2201 N. E. Kennedy street, plans construction of \$125,000 plant at Luck, Wis., including installation of steam power house.

Nebraska

ST. PAUL, NEBR. — Fleming Lumber Co. plans construction of lumber plant. Cost of building and equipment is estimated at \$37,000.

Missouri

BELLE, MO. — City receives bids Dec. 1 for construction of proposed water and sewer system at a cost of \$74,545. George E. Wells Inc., 420 Security building, Fourth and Locust streets, St. Louis, is consulting engineer. (Noted Sept. 21).

FAYETTE, MO. — Howard county electric co-operative has allotment of

\$265,000 for construction of 130 miles rural lines in Howard county.

Wyoming

CHEYENNE, WYO. — Owl Creek Irrigation district plans erection of pumping plant, to cost \$43,600. Aid in financing project has been secured from PWA.

Montana

SIDNEY, MONT. — City has allotment of \$84,000 for construction of East Side pumping project.

Idaho

GENESEE, IDAHO — City has WPA approval for proposed \$25,000 water system project. Bids for pump, chlorinator and other equipment are pending.

SODA SPRINGS, IDAHO — City will begin construction soon on proposed municipal power plant, to cost \$40,000.

Arizona

WICKENBURG, ARIZ.—City is planning construction of sanitary sewer system and has secured PWA loan of \$21,000, grant of \$17,812 for that purpose. H. S. Reed, State PWA, is engineer.

New Mexico

AVALON, N. MEX. — Union Potash & Chemical Corp. plans construction of potash mill and refining plant, including power house installation, on properties about 20 miles from here. Cost of project is estimated at \$85,000.

Pacific Coast

LOS ANGELES — Gladding McBean & Co., manufacturer of clay products, will construct \$40,000 warehouse addition at 2901 Los Feliz boulevard. Structure will be of steel and concrete with galvanized iron side walls and roof.

MARYSVILLE, CALIF. — Feather River Distilleries Inc., recently organized, plans construction of distillery here at a cost of \$100,000. W. H. Bryant is general manager; Houston, Houston & Houston, 1007 Seventh street, Sacramento, are correspondents.

NEWPORT BEACH, CALIF. — Kaymo Electric Speedboat Corp., 630 South Westlake avenue, Los Angeles, plans erection of large manufacturing plant here. Options on sites have been obtained and temporary headquarters established.

SAN ANGELO, TEX. — Texas Wool Scouring Corp., San Angelo National Bank building, plans installation of power unit in proposed scouring plant. Cost of entire project is estimated at \$100,000.

DAYTON, WASH. — Blue Mountain Cannery Inc. has started work on construction of blacksmith shop and garage. Plans for near future include erection of warehouse.

SEATTLE — Price, Yerkes Inc. has been organized by Emerson Price and associates, 1212 Hoge building, to deal in machinery, equipment and supplies.

SEATTLE — Seattle Gas Co. has approved plans for expenditure of over \$100,000 for plant improvements at 2000 Northlake avenue. Plans include four gas generators, boilers, electric precipitators etc. Contract for first unit of generators has been awarded to Puget Sound Machinery Depot, Seattle.

Canada

BOLTON, ONT.—Municipality plans waterworks system to cost \$30,000. James Proctor & Redfern, 36 Toronton street, Toronto, are engineers for the project.