STEEL

ESTABLISHED 1882

Contents

Volume 106—No. 20 **May 13, 1940**

PRODUCTION • PROCESSING • DISTRIBUTION • USE

Simple precautions assure

SOUND WELDS

IN NICKEL STEELS

PRODUCING pressure vessels to meet A. S. T. M. specifications, Black, Sivalls & Bryson, Oklahoma City, says, "Provided only that simple necessary precautions are used in fabricating, 2½% Nickel steel pressure vessels can be welded with complete success at the same speed as mild steel, with greatly improved strength, safety and durability in the completed structure." With Murex 2¼% Nickel Steel electrodes, smooth, sound welds are made in 2½" thick 2.00/2.75% Nickel low carbon plates used in fabricating 24' accumulators.

FACTS...*for the asking*

Preheating, stress relieving, tensile strengths, impact resistance, shop practices . . . these important facts about the weldability of Nickel steels are yours for the asking. Simply write for your copies of "Welding Nickel Steels" and "The Working of S. A. E. Nickel Alloy Steels." Consultation on problems involving the use of Nickel is invited.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

As the Editor Views The News

■ STEEL production last week (p. 27) moved up 3 points to 66½ per cent of ingot capacity and appears due for a further rise this week. The uptrend results from further moderate improvement in domestic business. Demand for sheets and strip is heavier. Some other products also reflect improved volume. Building construction is more active. On the other hand (p. 91), some recession in volume is seen for the third quarter—unless foreign buying of iron and steel is intensified. A trend in this direction is foreseen as a result of the war's spread to Belgium and the Netherlands. Finished steel prices are steadier. Scrap prices are rising more rapidly.

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Pension Plans Pay

With the federal old-age program taking adequate care only of those employes who earn less than $1300 a year, the problem of providing security for its most valued workers is an important one for management. Eugene M. Klein (p. 21) says it can be solved by supplemental pension plans which—if set up intelligently—actually may lessen payroll outgo. The problem has another important aspect—that of retiring aged workers to make room for youth. . . . This subject of finding employment for youth also came up for major discussion (p. 24) at last week's annual meeting of the American Foundrymen's association. Industry, it was held, must do something about the matter.

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Tools for Aircraft

The war (p. 38) is tightening the supply of South African industrial diamonds; prices have begun to ascend. . . . More than 25 per cent of the machine tools produced for domestic use (p. 35) now are being delivered to aircraft builders or their suppliers. . . . Open-house at Ryerson's steel warehouse (p. 90) in Chicago attracted a large attendance. . . . Plan for reorganization of Follansbee Bros. Co. as Follansbee Steel Corp. (p. 90) has court approval. The company will spend about $1,270,000 for new equipment. . . . Further temporary national economic committee hearings (p. 32) have been postponed until November. Wages-hours law revision (p. 34) is regarded as dead for this session.

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Saving By Safety

"A good safety program is good business," reports G. W. Cannon. His company (p. 46) obtained beneficial results of a diversified character from a thoroughgoing safety campaign—obtaining savings, incidentally, that paid for its entire cost. . . . Electrification—in conjunction with hydraulics, to which it is becoming more and more closely allied—is, according to Guy Hubbard (p. 50), the most powerful tradition-smashing factor which ever has penetrated the machine tool industry. He explains why. . . . Fred Stewart (p. 76) describes a flame cutting and arc welding setup developed for production of industrial trucks. Bends reduce the amount of welding needed.

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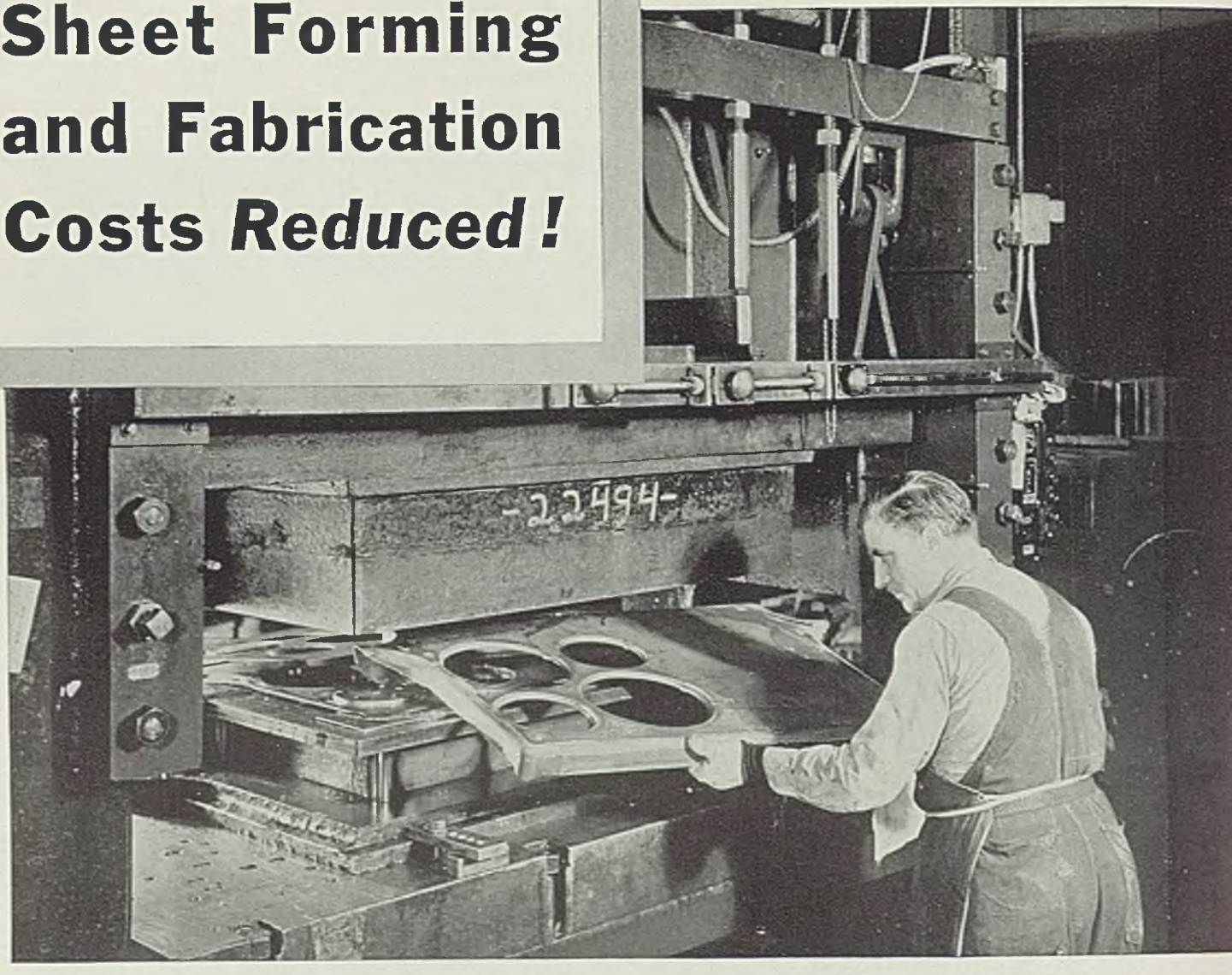
Lowering Casting Costs

When tin-contaminated steels run rather high in tin, says Paul McKimm (p. 68), they can be used for deep drawing sheets and strip, permitting lower-cost scrap to be charged. He discusses effects of other alloys on drawing properties. . . . Steel casting costs often may be lowered (p. 70) by proper design of the casting itself. To this end, says H. L. McClees, close cooperation between producer and user of the casting is essential. . . . A. N. Kugler (p. 71) offers practical suggestions on splicing steel beams of varying cross-sections. . . . A malleable foundry effects production savings (p. 52) by making different castings in a single mold.

E C Kreutzberg

Sheet Forming and Fabrication Costs *Reduced!*



MANY manufacturers are cutting production costs, making finer products, and beating competition with Inland special sheets and strip. They get these results because Inland metallurgists determine the kind of sheets best suited to their purpose—and, then work with the mill to produce the exact sheet specified.

Users of Inland Sheets can definitely count on superior forming qualities, constant uniformity, and fewer rejects, from beginning to end of production runs.

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Eugene M. Klein

An outstanding authority on industrial pension plans, Mr. Klein prepared for his career as a student at Western Reserve and Cleveland law school, Cleveland. Following his graduation in 1911 he studied employer-employe relationships as a part of his legal work for several industrial companies. In 1929 he installed a pension plan and became so interested that he decided to specialize in such work. Since then he probably has installed more pension plans than any other man in the country.

"Basically, a pension plan should coincide with the real objective for which a corporation exists — the profit motive."

WHAT PRICE OLD AGE?

By EUGENE M. KLEIN
Eugene M. Klein and Associates
Cleveland

With the federal old-age program taking adequate care of only those employes earning less than $1300 a year, the problem of providing security for its most valued workers is a vital one to management. Sound business reasons necessitate a solution

ALMOST every industrial organization—in every industry—is losing money or other values because it has not paid effective attention to the matter of retiring employes who have reached the age when they no longer are able to produce efficiently. Many companies do not even realize that they have a problem of this kind. Many dismiss it casually, taking the attitude that employes who have been in the service over a long period of years must be kept on the payroll.

In carrying on along such lines many companies go to unusual lengths. At the office of an Eastern manufacturer of rubber sundries, for example, are to be found four elderly men whose sole job is to push a carpet sweeper across the lobby rug. They are on the active payroll at $45 a week each. A man who has been 58 years in the employ of a casket manufacturer spends half a day, each day, in compiling figures which are thrown into the waste basket the moment he leaves the office. These cases are unusual—but modifications of them are to be found throughout industry.

For a number of reasons the average age of workers on industrial payrolls is increasing. Insurance statistics reveal that 20 to 40 per cent more workers today will live beyond the retirement age of 65 than has been the case in the past. Another factor is widespread unemployment. This has placed a premium on jobs, so that an employed person does not think lightly about leaving his job. Still another factor is the social security system. This impels employers to place a premium on employment stability, causing them to seek methods that will enable them to keep their men steadily at work. The net effect is that the problem of disposing of older, less efficient employes is growing and will continue to grow in importance.

Many companies in the past have set up pension plans. Industrial pension plans, in fact, date back as far as 50 years—so that there is nothing new about the pension idea. More than 5,000,000 employes today are covered by private pension plans operated by more than 1200 companies. These plans have demonstrated their value in many ways. They are powerful preventives of ill-considered labor agitation. Statistics of the Tax

". . . Average age of workers on industrial payrolls is increasing."

". . . Companies with pension plans have fewer labor disputes than those operating without such plans."

"It should be understood the federal old-age program in no circumstances affects the operation of private pension plans adversely. . . It takes adequate care only of those who earn less than $1300 yearly."

Research institute show that companies with pension plans have fewer labor disputes than those operating without such plans. These statistics reveal that where a pension plan is in effect there is less labor turnover and fewer requests are made for wage increases—they reveal that there is less breakage of machinery, more care in handling products, greater loyalty to the company, better employe attendance.

Recently a large company explained, as follows, its reason for adopting a pension system: "The corporation has recently suffered the loss of several important and valuable employes who, based upon inducements of various kinds, including the right to participation in pension plans, have left the corporation to enter the service of other companies."

Experience amply demonstrates that a wisely devised pension plan is an asset to an industrial organization in many ways. With the problem of old age becoming a more important one for industry, it is only logical to assume that more companies will feel impelled to adopt such plans. This is particularly the case under the federal program.

It should be understood the federal old-age program in no circumstances affects the operation of private pension plans adversely. On the contrary, the federal old-age program presents a means by which an employer's old-age pension program may be lightened. The federal old-age program takes care of employes in the low-income group. It takes adequate care only of those who earn less than $1300 annually.

The fact that clearly should be borne in mind by the executive who is concerned with the security of his retired workers is that the federal old-age program *does not* take care of his employes in the higher income groups. It does not provide security to an acceptable degree for the men who are of greatest value to him and who constitute the backbone of the business. It is these men that he must have in mind in revising his pension plan or setting one up under today's conditions.

The pension problem that confronts the typical manufacturer is revealed in a study in an Ohio company of employes' ages, salaries and the federal old-age benefits to which they are entitled at retirement age. It shows, for example, that a married man 29 years old and earning $800 a year will be entitled to a yearly benefit of $545.60 on retirement at age 65, or 68.2 per cent of his salary—provided his salary remains at that level. That amount may be regarded as satisfactory from the standpoint of security, because under pension plans it generally is considered fair to retire an employe on a pension equivalent to 50 per cent of his salary.

As the value of an employe grows and his compensation increases, his position under the federal old-age program rapidly deteriorates. For example, a man in the $3000-$4000 class who is now 30 to 34 years old can receive under the federal program an amount that is only 24.3 per cent of his salary at retirement.

Many people—including some that ordinarily are well-informed—regard a pension plan as a humanitarian measure. It is true that a pension plan has a humanitarian aspect. No organization, however, would be justified in setting up a pension plan from that point of view only. Basically, a pension plan should coincide with the real objective for which a corporation exists—the profit motive. Only when it has been determined that a pension plan will benefit the corporation, its employes and stockholders should the plan be approved for adoption.

Under a wisely conceived pension system, devised so that it will supplement the federal old-age program, an employer has unusual latitude in retiring the older, less efficient men, and of effecting payroll sav-

ings and unwarranted payroll expense in so doing. This applies to the great majority of employers—for it is practically impossible to discover a payroll that does not include salaries to employes who, from the standpoint of productive efficiency, really constitute a nuisance value. In evaluating his employes an employer is justified in depreciating them just as he depreciates his machinery and other equipment. And he can do so with full measure of fairness to the men involved if he has a proper pension system.

An example of the results that can be obtained through intelligent action is afforded by the case of a large chemical company. It had approximately 35,000 employes on its payroll. After careful study it decided to retire 294 employes who, at time of retirement, were receiving $592,000 annually. By redistributing duties, it replaced them with 180 new employes. Payroll for the replacements averaged only 56.8 per cent of the retired workers' compensation, so that net reduction in the payroll was $245,421. The pension program of this company costs $4629 less than the savings on the payroll.

The same problem was tackled by a Pennsylvania steel company. On retiring 300 old employes, it found that, through eliminating or redistributing duties, it was able to replace them with 111 younger workers. It paid the younger men a somewhat lower average salary—with the result that its payroll saving exceeded the pension expense.

In both these companies the approach on this problem took the form of a study in which the age structure was related to output per dollar of payroll, thus setting up an efficient measuring stick that met every condition of employment. This measuring stick quickly located the instances in which older employes were receiving wages not commensurate with the services they rendered.

While plant conditions and the possibilities of redistributing duties vary, this same type of approach can bring equally desirable results in most industrial organizations. The main thing is to recognize the problem and then set about its solution. Benefits can be obtained immediately by taking advantage of the FOAP to retire workers in the less-than-$1300-a-year income group. A certain amount of time may be necessary to retire those in the higher-income group. This might result from the necessity of accumulating funds over a period for the purpose of creating a reserve out of which pension payments can be made suggesting, of course, the wisdom of early rather than delayed attention to the problem.

In addition to creating an outlet for employes over 65, effective action under the FOAP and private pension plans has a desirable effect in another direction. It opens new opportunities to youths. Unemployment among youths to the extent of 2,600,000 seems possible of considerable amelioration when it is recalled that 2,500,000 now employed in industry are more than 65 years of age and ready for retirement. This is a matter of no small significance to industry when it is remembered that on the youth of today devolves the responsibility for the industry of tomorrow. It also is of significance in view of the fact that unemployment among youth incites discontent that adds to the menace on the social and political front.

Considered in that light, every man over 65 now active in industry is the cause of a certain amount of dissatisfaction which expresses itself in one way or another—frequently in the form of votes for political candidates who, no matter how unsound their proposals regarding business and economics may be, are loud and impressive with their promises.

". . . It is practically impossible to discover a payroll that does not include salaries to employes who, from the standpoint of productive efficiency, really constitute a nuisance value."

"In addition to creating an outlet for employes over 65 . . . it opens new opportunities to youths."

". . . 2,500,000 now employed in industry are more than 65 years of age and ready for retirement."

Lester N. Shannon
Elected president, American Foundrymen's association

Foundry Convention

Featured by Large Attendance, Attractive Exhibits

Frederick A. Melmoth
Recipient of Joseph S. Seaman gold medal

Charles E. Wilson
Presented A.F.A. board of awards lecture

■ DIVERTING its attention temporarily from strictly technical subjects, the American Foundrymen's association holding its forty-fourth annual convention at the Palmer House, Chicago, May 6-10, laid emphasis on the training and preparation of youth that it may be able to find and assume a place in industry. In line with all industry, the foundry field is maintaining its record for technological progress, even though beset on all sides by economic and political maladjustment. To continue this progress, youth must be encouraged in developing clear thinking and leadership.

Holding of a Foundry and Allied Industries show in International Amphitheatre proved an attraction which stimulated attendance at convention sessions. Registration for the week totaled 7000. The show with nearly 225 exhibits of foundry equipment and supplies, was one of the largest which the association has conducted and was by far the most attractive. Open on the first five days of the week and the preceding Saturday, it had much to offer in the way of new products brought out in the two years since the last show in Cleveland in 1938.

Visit Steelworks

Convention sessions, extending over five days, featured meetings, round-table luncheons and discussions, dinners, shop operation courses, lectures, and committee meetings covering all phases of the steel, gray iron, malleable and nonferrous branches of castings production. In addition, sessions were conducted on apprentice training, foreman training, job analysis and costs.

An organized inspection trip on May 6 took approximately 300 foundrymen to the Wisconsin Steel Works of International Harvester Co., South Chicago, Ill., where they saw blast furnace, coke oven, steelmaking and rolling operations. On the return trip, a stop was made at the Museum of Science and Industry to see the recently installed foundry department.

In his presidential address before the annual business meeting, May 8, Henry S. Washburn, president and treasurer, Plainville Casting Co., Plainville, Conn., cited the rapid pace of technical improvements as a challenge to the foundry industry, a challenge which can be met in part if foundrymen will accept their responsibility of membership in the industry's technical society and thus promote the beneficial exchange of ideas.

"Fresh Thinking" Needed

He stressed the importance of encouraging "fresh thinking" young men to take their proper place in the industry, and urged that such young men be given an opportunity to test their ideas before they slipped into the rut of orthodox experience and thinking.

"Give them this chance," he concluded, "and use the A. F. A. as a clearing house for ideas; then we can face the future with confidence."

Urging industry to make determined efforts to restore hope, ambition and morale among young men seeking positions, to take renewed interest in curricula of schools and colleges to the end that young people may be better prepared for positions in industry, and to make further special attempts to provide places for young men in plants, Charles E. Wilson, executive vice president, General Motors Corp., Detroit, presented the feature address at the business meeting.

His remarks constituted the third in a series of annual presentations sponsored by the A. F. A. board of awards to stimulate discussion of non-technical problems of general interest.

Mr. Wilson's address was keyed to the theme of the meeting which was

Herbert S. Simpson
Elected vice president, American Foundrymen's association

Nathaniel K. B. Patch
Recipient of John A. Penton gold medal

Frederick K. Vial
Recipient of J. H. Whiting gold medal

focused on opportunities for youth, and industry's responsibilities in providing therefor. Recalling his own personal experience as a young man seeking employment, he emphasized the changed conditions which confront young people today and the fact that they are bearing more than their share of current unemployment.

"Thirty or forty years ago, industry and working activities were not on such a formal and large scale, and it was much easier for a boy or young man to see what men did when they worked, and, even before they were old enough themselves to work, to begin to understand how to do things."

Mr. Wilson observed that parents today are too prone to conclude that a formal education is a guarantee for their offspring's economic security and place in society. Figures attest the widespread increase in education over the past 20 years. For example, in 1920 there were 311,266 high school graduates and in 1938 there were 1,075,000. In 1920 there were 48,622 college graduates; in 1938 there were 147,500.

Despite this emphasis on education, unemployment among young people is serious, leading to the conclusion that book learning alone, without the knowledge of how or the willingness to do some of the simpler jobs ultimately proves a handicap.

Industry Helping Youth

Mr. Wilson noted that industry in many cases has recognized the problems of youth seeking employment and he commended the efforts being made to solve them. Apprentice training programs, such as the A. F. A. has sponsored for many years, are a definite step toward alleviating the distress of idle youth.

As a token of association appreciation, President Washburn at the conclusion of the address presented Mr. Wilson with a cast bronze horse executed by a Chicago sculptress.

Lester N. Shannon, vice president and works manager, Stockham Pipe Fittings Co., Birmingham, Ala., was elected president to succeed Mr. Washburn. He served in the capacity of vice president during the past year, and for three years prior to that as a director.

Born in Carbon Hill, Ala., in 1893, Mr. Shannon attended public schools there and later Birmingham Southern college from which he graduated with a B.S. degree in 1912. Immediately thereafter he became associated with the Stockham company in whose service he has risen to his present position. He was instrumental in organizing and was the first chairman of the Birmingham district chapter, American Foundrymen's association. Mr. Shannon also is a member of the American Society of Mechanical Engineers and American Society for Testing Materials.

Five Directors Elected

Herbert S. Simpson, president, National Engineering Co., Chicago, and a past director of the association, was elected vice president for one year. Born in Minneapolis in 1884, he moved to Chicago when a young boy. Completing his education, he engaged in the manufacture of clayworking machinery, later becoming assistant to the president, Hatfield-Penfield Steel Co., Bucyrus, O. In 1917 he left that company to associate himself with the National Engineering Co., manufacturer of foundry equipment, of which organization he has been president.

Mr. Simpson is a past president, Foundry Equipment Manufacturers association, and for many years has supported various research activities of A.F.A. and has been active in other ways. He is past president, Kiwanis Club of Chicago, a former alderman of Evanston, Ill., and at present a trustee of that city's library board. In recent years he has traveled widely in Australia, South America, Mexico and Europe.

Five directors to serve three-year terms were elected as follows: George W. Cannon, vice president, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.; L. P. Robinson, sales manager, Werner G. Smith Co., Cleveland; Harold J. Roast, vice president, Canadian Bronze Co., Montreal, Canada; B. D. Claffey, manager, gray iron division, General Malleable Corp., Waukesha, Wis.; and Retiring President Henry S. Washburn.

Medals Awarded

Four medals for 1940 and an honorary life membership were presented at the business meeting. The John A. Penton gold medal was awarded to Nathaniel K. B. Patch, secretary, Lumen Bearing Co., Buffalo; the J. H. Whiting gold medal to Frederick K. Vial, director and vice president, Griffin Wheel Co., Chicago, and director and vice president, Association of Manufacturers of Chilled Car Wheels, Chicago; the W. H. McFadden gold medal to Harry W. Dietert, president, Harry W. Dietert Co., Detroit; and the Joseph S. Seaman gold medal to Frederick A. Melmoth, vice president and works manager, Detroit Steel Casting Co., Detroit.

The honorary life membership was conferred upon George A. T. Long, in charge of the foundry service department, Pickands, Mather & Co., Chicago, for the past 37 years.

The four medals were established by the association in 1920 through funds donated by four past presidents whose names are associated with the medals. Awards are made upon recommendation of a board composed of the last seven living past presidents.

Mr. Patch received the Penton

■ Climax to special activities of the American Foundrymen's association annual convention in Chicago last week was the banquet at the Palmer House, May 9. Nearly 1000 members and guests of the organization attended

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medal "in recognition of his contributions to the foundry industry." Associated with the Lumen Bearing Co. since 1901, he has been prominent in technical organizations connected with the brass founding industry. He was one of the original organizers of the American Brass Founders' association, was one of its first directors, and was president in 1911.

Mr. Patch also served as chairman of the committee on nonferrous metals of the American Society for Testing Materials and has been a member of the American Chemical society; Electrochemical society; Institute of Metals (British); Institute of Metals division, American cal Engineers; and Buffalo Engineering society. He has been active in the A.F.A. many years, serving on many committees, as a director in 1926, vice president in 1929, and president in 1930-31. He has written many articles on foundry practice.

Basis of the Whiting medal award to Mr. Vial was "his outstanding contribution to the development of cupola melting." Becoming affiliated with the Griffin Wheel Co. in 1902 after extensive experience in the railroad field, he was named consulting engineer for the Association of Manufacturers of Chilled Car Wheels when it was organized in 1906.

As a member of the A.F.A., American Society for Testing Materials, Western Society of Engineers and Air Brake association, Mr. Vial has presented an extensive list of technical papers relating to research, car wheels, railway problems and cupola melting processes. He also has collaborated in the preparation of research bulletins of the University of Illinois, Purdue university, Massachusetts Institute of Technology and Battelle Memorial institute.

Many patents are credited to Mr. Vial, dealing largely with car wheels, molding methods and melting processes. For his achievements, he already has been recognized by many organizations through medals and honorable mention. His activities have had a profitable influence on improvements in railway appliances and foundry methods.

Harry W. Dietert
Recipient of W. H. McFadden gold medal

The McFadden medal was given to Mr. Dietert "in recognition of his valuable contribution in promoting foundry sand research and control." After two years in the Philadelphia works of Westinghouse Electric & Mfg. Co., a brief period as instructor in charge of shops at Rice institute, Houston, Tex., and a year of graduate work at the University of Illinois, in 1923 Mr. Dietert became a research engineer for the U. S. Radiator Corp., Detroit, and here was instrumental in developing the sand control methods of that company. Later serving as chief engineer, he resigned to organize his own company for the manufacture of sand testing equipment, although retaining his connection with U. S. Radiator Corp. as consultant.

Mr. Dietert has served on the A.F.A. sand research committee since the committee was started in 1921 and has played a prominent part in developing sand control methods, in research work, in presenting papers on sand control and in lecturing on that subject before practically all foundry groups in the United States.

As a member of the sand research committee, he has worked on the committee on conservation and reclamation, committee on tests, subcommittee on core tests, subcommittee on hardness testing and mold permeability, subcommittee on durability, subcommittee on grading and fineness and subcommittee on physical properties of sands at elevated temperatures. In addition to the A.F.A., he is a member of the American Society of Mechanical Engineers and American Association for the Advancement of Science.

Presentation of the Seaman medal to Mr. Melmoth was "in recognition of his outstanding contributions to the advancement of the steel casting industry." Born and educated in England, he had extensive experience in the steel and foundry industries before coming to the United States in 1930 to become affiliated with the Detroit Steel Casting Co., of which he is now vice

president. He has written extensively for the technical press on various phases of steelmaking, steel founding and malleable iron.

Mr. Melmoth is a member of the A.F.A. policy committee on *Handbook* revision, the executive committee of the steel division, and the committee on methods of producing steel for castings. He was recently awarded a diploma of the Institute of British Foundrymen for his exchange paper presented at the 1939 International Foundry congress in London. In addition to the A.F.A., Mr. Melmoth is a member of the American Society for Metals, and through his company the Steel Founders Society of America.

The honorary life membership to Mr. Long was conferred "in recognition of his many years in the cupola, pig iron and coke consulting field." In his capacity with Pickands, Mather & Co. over 37 years, he has been in a position to render an unique and invaluable service to foundrymen of the Central Western section. Mr. Long takes particular pride in the fact that he has attended every convention of the A.F.A. since the first one in Philadelphia in 1896.

In addition to Mr. Long, life memberships were conferred upon Retiring President Washburn, and upon Messrs. Vial, Dietert and Melmoth, three of the four medallists. Mr. Patch, the fourth medallist, already held life membership as a past president.

The annual banquet was served at the Palmer House on May 9, with approximately 1000 attending. Varying from custom of previous years, the program consisted of entertainment and dancing.

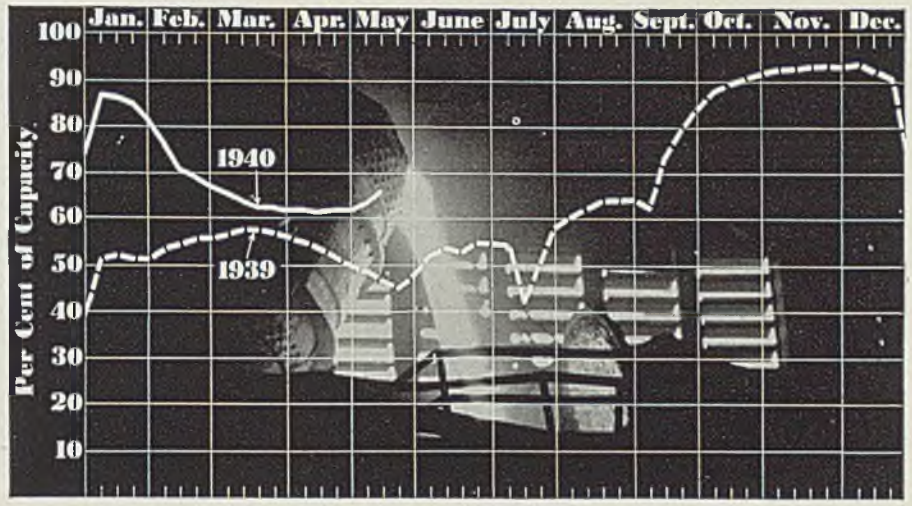
(For resume of technical sessions see pages 52-54.)

Most Beautiful Bridge Contest To End June 1

■ American Institute of Steel Construction, 101 Park avenue, New York, last week invited bridge builders and owners to enter its twelfth annual contest for the most beautiful steel bridge erected during 1939. Photographic entries must be made not later than June 1.

Stainless steel plaques will be awarded bridges adjudged most beautiful in their division. Class A includes bridges costing $1,000,000 or more to build; class B, $250,000 to $1,000,000; class C, less than $250,000; and class D, all movable bridges.

Following data should accompany photographs submitted: Name of bridge, location, total cost, engineer, fabricator, owner, date completed, date opened to traffic, span length, and roadway width.



PRODUCTION... Up

■ STEELWORKS operations last week rose 3 points to 66.5 per cent, highest rate since the end of February. Seven districts showed increases, one a decline and four were unchanged. A year ago the rate was 47 per cent; two years ago it was 30 per cent.

Chicago—Increased 6 points to 65½ per cent, the sharpest upturn since September, carrying the rate to the level of late February. Carnegie-Illinois Steel Corp. added a blast furnace at South Works, making a total of six active at that plant. Six are also in blast at the Gary works.

Birmingham, Ala.—Unchanged at 83 per cent for the third consecutive week, with 18 open hearths active.

Pittsburgh—Up 3½ points to 61½ per cent. Jones & Laughlin Steel Corp. has resumed production at two stacks of Eliza furnace, Pittsburgh. In the district 32 of 50 stacks are blowing. Steelmaking will advance to 65 per cent this week.

Wheeling—Slight curtailment at two plants dropped the rate 6 points to 88 per cent.

Buffalo—Advanced 14 points from the average of the previous week, to 58 per cent, six open hearths being added in the past ten days.

Central eastern seaboard—Held at 57 per cent, with no change indicated for this week.

New England—Steady at 53 per cent, slight curtailment at two plants being balanced by an increase by another.

St. Louis—Regained 2½ points to 45 per cent. A leading producer added one open hearth.

Cleveland—Gained 1 point to 71 per cent. Expansion by one interest more than offset a small reduction by another.

Cincinnati—Jumped 8 points to 61 per cent, with some producers at 70 per cent.

Detroit—Continued at 70 per cent, with indications this rate will continue for some time.

Youngstown, O.—Rose 3 points to 53 per cent as three open hearths were added. Three bessemers and 48 open hearths are in production. Outlook for this week is for steady operation or possibly a slight rise.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended May 11	Change	Same week 1939	Same week 1938
Pittsburgh ...	61.5	+ 3.5	36	25
Chicago	65.5	+ 6	46.5	31.5
Eastern Pa. ...	57	None	37	27.5
Youngstown ..	53	+ 3	42	27
Wheeling	88	— 6	64	38
Cleveland	71	+ 1	45.5	23
Buffalo	58	+14	35	28
Birmingham ..	83	None	55	66
New England..	53	None	45	30
Cincinnati	61	+ 8	52	25
St. Louis.....	45	+ 2.5	51	33.3
Detroit	70	None	59	18
Average	66.5	+ 3	47	30

Five New Directors Elected by Institute

■ Five new members have been elected to the board of directors of American Iron and Steel institute to fill vacancies.

New directors are: Thomas R. Akin, president, Laclede Steel Co., St. Louis; Elton Hoyt II, managing partner, Pickands, Mather & Co., Cleveland; W. H. Sommer, president, Keystone Steel & Wire Co., Peoria, Ill.; John T. Whiting, president, Alan Wood Steel Co., Conshohocken, Pa.; and D. A. Williams, president, Continental Steel Corp., Kokomo, Ind.

■ Machine tool engineers and executives hear latest on electrification at Westinghouse forum at East Pittsburgh, Pa.

New Developments in Machine Tool Electrification Described at Forum

■ FOR the fifth time since 1936, engineers and many executive heads of the leading American machine tool building companies met at the Westinghouse plant in East Pittsburgh, Pa., on May 6, 7 and 8, to participate in a Machine Tool Electrification Forum. It is indicative of the importance of this trend in machinery drive and control that, at a time when their industry is operating at peak capacity, more than 100 key men representing more than 80 organizations believed it worth while literally "to go back to school," for three days to get themselves up to date on the theory and practice of electrification.

The program included 14 papers, of which nine were presented by representatives of the electrical industry, while five were by members of the machine tool industry. While, as might be expected, the majority of the papers were highly technical in character, there were very interesting ones which broke away from the purely engineering phases. One of these, by D. L. Hadley, consulting designer of the Westinghouse company, dealt with the methods followed in so-called "streamlining" of electrical equipment, and the remarkable dollars-and-cents advantages achieved thereby. Two other speakers, W. K. Bailey, sales manager, Warner & Swasey Co., Cleveland, and C. D. Moore, supervisor of trades training for Westinghouse, dealt with methods of basic training and of improving the skill of industrial workers, including machine tool operators.

Other speakers included J. C. Wilson, engineer, Thompson Grinder Co, Springfield, O.; R. S. Elberty, electrical engineer, Landis Tool Co., Waynesboro, Pa.; D. K. Frost, electrical engineer, Mattison Machine Works, Rockford, Ill.; A. H. Platt, electrical engineer, Bullard Co., Bridgeport, Conn.; and W. I. Bendz, S. B. Britain, W. M. Moody, C. B. Steinback, C. W. Drake, R. W. Owens and O. G. Rutemiller and Bernard Lester of the Westinghouse organization.

During an open forum devoted to discussion of problems not covered by the regular program, August H. Tuechter, president, Cincinnati Bickford Tool Co., Cincinnati, acted as spokesman for the machine tool industry in a spirited defense of the industry as far as deliveries are concerned at a time like the present when the builders are striving to be fair to all when operating under terrific pressure for production.

Exports Dislocated by Extension of War

■ News of Germany's invasion of Holland, Belgium and Luxemburg brought steel export business to those countries to a temporary halt. For the past fortnight, inquiries from those countries and from neutrals in the Balkan and Mediterranean areas have been dwindling —the result of belief war would spread before deliveries could be made.

Considerable pig iron inquiry has been held up, as has a large scrap inquiry from Italy. Plate sellers particularly have felt the shrinkage in demand from Holland and Scandinavia.

American exports of iron and steel products to Belgium, including Luxemburg, totaled 13,102 tons during 1939. Iron and steel exports to The Netherlands aggregated 116,262 tons last year. United States imported, in the same period, 73,524 tons of iron and steel products from Belgium, compared to 15,385 tons from The Netherlands.

Iron and steel trade to these countries increased materially during first quarter this year. Exports of these products to Belgium totaled 10,595 tons in first three months; to The Netherlands, 52,160 tons. United States' imports from Belgium in first 1940 quarter aggregated 1465 tons, from The Netherlands, eight tons.

Machinery exports to The Netherlands during 1939 totaled $3,284,000; to Belgium and Luxemburg, $1,882,437.

Steel Corp. Shipments In April Off 2.5%

■ April shipments of finished steel by the United States Steel Corp. totaled 907,904 net tons, a decrease of 24,001 tons, 2.5 per cent, from 931,905 tons shipped in March, but an increase of 136,152 tons over April shipments last year. For four months total shipments were 3,994,657 tons this year, compared with 3,235,153 tons in the same period, 1939.

U. S. Steel Corp. Shipments
(Inter-company shipments not included)

Net Tons

	1940	1939	1938	1937
Jan.	1,145,592	870,866	570,264	1,268,403
Feb.	1,009,256	747,427	522,395	1,252,845
March	931,905	845,108	627,047	1,563,113
April	907,904	771,752	550,551	1,485,231
May	.....	795,689	509,811	1,443,477
June	.....	807,562	524,994	1,406,078
July	.....	745,364	484,611	1,315,353
Aug.	.....	885,636	615,521	1,225,907
Sept.	.....	1,086,683	635,645	1,161,113
Oct.	.....	1,345,855	730,312	875,972
Nov.	.....	1,406,205	749,328	648,727
Dec.	.....	1,443,969	765,868	539,553
Total, by Months	.....	11,752,116	7,286,347	14,184,772
Adjustment	..	*44,865	†29,159	*87,106
Total	.....	11,707,251	7,315,506	14,097,666

†Increase. *Decrease.

MEN of INDUSTRY

■ E. A. BERRY has been elected treasurer, Koppers Co., Pittsburgh, to succeed S. T. Brown, who retired recently due to illness. Mr. Berry has been an assistant treasurer. Myron T. Herreid, superintendent of Koppers Co. Minnesota division, St. Paul, has been elected vice president of Koppers Co., in charge of Minnesota division. He succeeds E. L. Smith, who has temporarily withdrawn from active management of the Minnesota plant. R. G. McKinney, of the Pittsburgh office, has been named assistant secretary and assistant treasurer of Koppers Co., Bartlett Hayward division, Baltimore. He succeeds George E. Probest Jr. and H. H. Vordemberg, who have retired.

♦

Charles S. Bradeen has been appointed executive vice president, Canadian Fairbanks-Morse Co. Ltd., Montreal, Canada. Since May, 1938, he has been assistant to Col. Robert H. Morse, president of Fairbanks, Morse & Co., Chicago, and before that was located in Montreal with the Canadian organization as secretary.

♦

B. O. Smith has been appointed director of purchases, Hayes Mfg. Corp., Grand Rapids, Mich.

♦

Frank B. Thacher, assistant general manager, Interlake Iron Corp., Chicago, resigned May 1.

♦

John R. Fuller has been appointed general purchasing manager, Hygrade Lamp division, Hygrade Sylvania Corp., Salem, Mass.

♦

G. E. Hunt, identified with Cutler-Hammer Inc., Milwaukee, about 20 years, serving at various times in the New York, Philadelphia, Milwaukee and Cleveland sales offices,

G. E. Hunt

Charles S. Bradeen

has been placed in charge of the company's Indianapolis office located at 307 North Pennsylvania avenue. This office is under direct supervision of C. J. Maloney, manager, Chicago district sales territory.

♦

E. R. Walker has been named manager, air conditioning division, Fedders Mfg. Co., Buffalo.

♦

Giles E. Hopkins has been named technical director, United States Asbestos division of Raybestos-Manhattan Inc., Passaic, N. J.

♦

A. L. Struble, the past year assistant sales manager, Fruehauf Trailer Co., Detroit, has been named general sales manager.

♦

Thomas S. Hammond, president, Whiting Corp., Harvey, Ill., has been elected a director, American Airlines Inc., Chicago.

♦

R. F. Heath, heretofore in charge of the Houston, Tex., territory for Manning, Maxwell & Moore Inc., Bridgeport, Conn., has been transferred to New Orleans, replacing Jack Schuyler.

♦

William M. Neal has been elected secretary, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., and will also serve as assistant treasurer. W. S. Wilson has been made treasurer and assistant secretary.

♦

James C. Gray, formerly superintendent of Tennessee Coal, Iron & Railroad Co.'s Wylam coal mine, has been appointed chief inspector, coal mines division. He succeeds Angus R. Brown, who has become superintendent of ventilation, coal mines division. William M. Lacey, heretofore superintendent, Edgewater coal mine, succeeds Mr. Gray as superintendent at Wylam. Mr. Lacey is succeeded by Ralph B. Watt, his former assistant at the Edgewater mine.

♦

L. Martin Krautter has been appointed advertising and sales promotion manager, Crosley Corp., Cincinnati. He formerly was copy chief, Cramer-Krasselt Co., Milwaukee advertising agency.

♦

Percy D. Siverd has become manager of sales, bolt, nut and rivet division, Pittsburgh Screw & Bolt Corp., Pittsburgh. He has been with the company in various capacities since 1916.

♦

Clyde E. Lowe, of Pittsburgh, has been appointed representative in that area for Cowles Detergent Co., Cleveland, maker of industrial alkalies and soaps. He will work with Apex Soap & Sanitary Co., McKees Rocks, Pa., a Cowles distributor.

♦

George W. Walker, industrial designer and stylist, has moved to new and larger offices at 513 New Center building, Detroit. Kurt Wittke and Theodore Ornas are on his staff at the new location.

♦

John D. Thompson, formerly assistant to the vice president, Stanley Works, Bridgeport, Conn., has been appointed works manager, John A. Roebling's Sons Co., Trenton, N. J.

♦

Dean D. Francis, formerly vice president, National Bronze & Aluminum Co., and president, Wheeler-Schebler Carburetor Co., is president and treasurer of Sheet-Wire Corp., Detroit, recently formed to enter

Dean D. Francis

into manufacture, with steel mills and nonferrous fabricators, of rods, bars and wire by an entirely new and lower cost process (STEEL, Jan. 29, p. 28).

By the new process, wire, bars and rods—round, flat or polygonal—are produced by continuous slitting of sheets into many strands instead of requiring the use of multiple drawing dies, standard practice today. Plans for the first installation are already under way with an important steel producer.

Other officers are: Vice presidents, F. E. Birch, former chief engineer, Buffalo Pressed Steel Co.; F. L. Armstrong, formerly vice president, Thorne Motor Corp. and Gas-Electric Corp., Chicago; secretary and assistant treasurer, Athel F. Denham, president, Denham & Co., Detroit.

♦

George F. Emanuels has been appointed district sales representative in the southern California territory for Columbia Steel & Shafting Co., Pittsburgh, with headquarters in Los Angeles.

♦

Lawrence H. Wilson, product designer and stylist, has opened new offices at 913 Stephenson building, Detroit. In recent years Mr. Wilson served as head stylist for Norge and Detroit Vapor Stove divisions of Borg-Warner Corp.

♦

George A. Duden has joined Standard Tube Sales Corp., New York, exclusive eastern agent for Detroit Seamless Steel Tubes Co., Detroit, and Standard Tube Co., Detroit. Mr. Duden has been associated with numerous warehouses and distributors of steel tubing over 40 years.

♦

John Fox, manager, pressed steel department, American Car & Foundry Co., Milton, Pa., has been made chief metallurgist at the recently re-opened Buffalo plant. John O. Kline, formerly general foreman of the car department, has been made superintendent, pressed steel department.

♦

Wilfred A. Clabault has been named advertising manager, Roller-Smith Co., Bethlehem, Pa., maker of electrical measuring and protective devices. Mr. Clabault, who also will be engaged in sales, formerly was a member of Westinghouse Electric & Mfg. Co.'s advertising department.

♦

Harlow H. Curtice, general manager, Buick Motor division, General Motors Corp., and Paul Garrett, director of public relations department, General Motors, have been appointed vice presidents of the corporation. Mr. Curtice has spent all of his business career in the automotive industry, starting with the AC Spark Plug Co. in 1914 as an ac-

A. G. Bussmann

Who has been elected general sales manager, Wickwire Spencer Steel Co., New York, as reported in STEEL, May 6, page 24. He succeeds R. L. Foster, retired

countant and advancing to the presidency in 1929. He became general manager of Buick in 1933. Mr. Garrett, with General Motors since 1931, has held several posts in research and financial writing. He was with the bureau of municipal research in New York, New Jersey state chamber of commerce, war industries board, American International Corp., and from 1925 to 1931 was financial editor, *The New York Evening Post*.

♦

A. W. Limont Jr. has joined the Titusville processing equipment division of Struthers-Wells-Titusville Corp., Titusville, Pa. Mr. Limont, a mechanical engineering graduate of Cornell university, was for many years with E. I. du Pont de Nemours & Co., specializing in chemical plant equipment, and as a project engineer on chemical plant design.

♦

Elliott C. Paddock, associated with Corbin Screw Corp., New Britain, Conn., since June, 1939, as assistant sales manager, has been named sales manager. He succeeds E. E. Baldwin, resigned. Before joining Corbin Screw Corp., Mr. Paddock was assistant sales manager, Greenfield Tap & Die Corp., Greenfield, Mass.

Charles W. Trust

Whose appointment as general traffic manager of United States Steel Corp. subsidiaries was announced in STEEL, May 6, page 40

♦

L. Clayton Hill, formerly manufacturing manager, has been elected vice president in charge of manufacturing, Murray Corp. of America, Detroit. David Widman, heretofore secretary-treasurer, has been made vice president in charge of finance. H. W. Wurster succeeds Mr. Widman as secretary-treasurer.

♦

S. W. Gibb has been promoted to general sales manager, Philadelphia division, Yale & Towne Mfg. Co., Stamford, Conn. He succeeds James C. Morgan, who has become general manager of all Philadelphia operations. He joined the company in 1920 as district sales manager at Pittsburgh; in 1929 was promoted to Pacific coast sales manager, and in 1931 was made assistant general sales manager at Philadelphia.

♦

Paul E. Hovgard, veteran test pilot and engineer, has joined Glenn L. Martin Co., Baltimore, as chief research engineer. He succeeds John B. Wheatley, who now assumes responsibility for the company's development work.

♦

Joseph V. Santry, since 1933 executive vice president, Combustion Engineering Co. Inc., New York, has been elected president, to succeed Frederic A. Schaff, who has become vice chairman of the board. George L. Bourne has been re-elected chairman of the board. Mr. Bourne is also chairman of the company's parent organization, Superheater Co., of which Mr. Schaff is president.

Robert M. Gates, vice president in charge of sales since 1933, has resigned to become president, Air Preheater Corp., New York, an affiliated company of Superheater Co. Martens H. Isenberg, heretofore vice president in charge of production, succeeds Mr. Santry as executive vice president, and Albert C. Weigel, formerly assistant to the president, has been made a vice president.

Harold H. Berry, John Van Brunt, F. H. Rosencrants, Charles H. True, and John S. Skelly have been re-elected vice presidents, Other officers re-elected: Harold H. Berry, treasurer, George D. Ellis, secretary and controller. I. B. Swigart has been reappointed assistant secretary and assistant treasurer, and Thomas F. Morris, assistant secretary. Frank R. Fitzpatrick has been named assistant to vice chairman.

Activities of Steel Users, Makers

■ ROLLER-SMITH CO., Bethlehem, Pa., has transferred its switchboard division to a recently acquired plant in Allentown, Pa. The air and oil circuit breaker and instrument divisions will remain in Bethlehem. J. E. Bevan will be manager of the division, with supervision over engineering and manufacturing. W. R. Swoish will continue in charge of sales. Approximately 60 men will be employed at the new location.

♦

Metallizing Engineering Co., Long Island City, N. Y., has named Rickard & Co., New York, advertising and merchandising counsel.

♦

Ward Leonard Electric Co., Mount Vernon, N. Y., has opened a branch office in the Hearst Tower building, Baltimore, with Wilson K. Winbigler in charge.

♦

Ransome Concrete Machinery Co., Dunellen, N. J., has appointed Ebbert & Kirkman Co., Birmingham, Ala., exclusive sales representative for its welding tables and positioners in Alabama and part of Florida.

♦

Western Precipitation Corp., Los Angeles, has opened a sales and engineering office at 1137 Marquette building, Chicago. A. W. Robinson, associated with the firm many years, is in charge of operations in the central states.

♦

Davison Chemical Corp., Baltimore, manufacturer of Silica Gel, has completed arrangements whereby C. M. Kemp Mfg. Co., Baltimore, will manufacture and market through its sales organization a complete line of Silica Gel drying units for industrial dehydration.

♦

Thomas C. Wilson Inc., maker of tube and pipe cleaning equipment, is now occupying the new office and manufacturing quarters it leased at 47-28 Thirty-seventh street, Long Island City, N. Y. The company was formerly located at 55 Vandam street, New York.

♦

Northern Equipment Co., Erie, Pa., has appointed Meleney Engineering Co., Washington, district representative for its line of Copes feed water regulators, differential valves, pump governors, desuperheaters, pressure reducing valves and allied equipment.

♦

J. B. Trotman, manager, turbine pump division, Roots-Connersville Blower Corp., Connersville, Ind., has appointed the following territorial representatives: Kent-Ervin Engineering Co., Builders Exchange building, Minneapolis, covering Minnesota and North and South Dakota; J. T. McKinney, 1122 Pointview street, Los Angeles, southern California; P. J. O'Meara Co., 5 Hawthorne street, San Francisco, northern California and most of Nevada; L. S. Pawkett & Co., San Antonio, Tex., south central Texas; Power Machinery Co., Tulsa, Okla.; H. K. Wilson, St. Petersburg, Fla.

Died:

■ SAMUEL WILEY WAKEMAN, a vice president and director, Bethlehem Steel Co., in New York, May 8. He was in charge of Bethlehem's shipbuilding activities since 1926. After graduation from Cornell university he joined Newport News Shipbuilding & Dry Dock Co., Newport News, Va., following which he became associated with New York Shipbuilding Corp., Camden, N. J. When the Fore River Shipbuilding Co. was taken over by Bethlehem in 1914, he was made general superintendent, later becoming general manager. He also was in charge of the plant at Squantam, Mass., and the Buffalo turbine and Providence boiler shops.

♦

William H. Quinn, 48, New York manager for Chain Belt Co., Milwaukee, May 5 at his home in Munsey Park, L. I.

♦

Charles H. Johnson, 58, executive vice president and director, Gisholt Machine Co., Madison, Wis., April 23. His entire life was spent in the machine tool industry, having started with Gisholt Machine Co. as a machinist in 1897. Later he went to Europe as a demonstrator and assistant in sales; then he was made European manager, with headquarters at Cologne, Germany. Returning to Madison in 1918 he became a vice president, and in 1932, executive vice president.

Charles H. Johnson

♦

Frank E. Fisher, 81, inventor of the Fisher self-starter for automobiles, and prominent in fraternal affairs in Detroit for half a century, in that city, April 30.

♦

Charles T. Evans, 82, former general manager of steelworks, Henry Disston & Sons Inc., Philadelphia, April 30 at his home in Swarthmore, Pa. He retired in 1926 after 40 years service with the company.

♦

James W. Wilson, 65, retired official of National Tube Co., McKeesport, Pa., April 27. At one time he was superintendent of steelworks and blast furnace department, and later assistant to the president. He also was superintendent of the company's continental works.

♦

Robert F. Carpenter, 66, president and treasurer, Carpenter Metal Products Co., Cleveland, May 4, at his home in Cleveland Heights, O. In 1916 Mr. Carpenter founded the Sanymetal Products Co., predecessor of Sanymetal Co. Inc. He left Sanymetal in 1933 and formed Carpenter Metal Products Co.

♦

William R. Mitchell, 61, executive vice president, National Acme Co., Cleveland, at his home in Cleveland Heights, O., May 8. Associated with National Acme since 1902, when the company was established in Cleveland following removal from Hartford, Conn., he was its oldest employe in term of service. As a product division superintendent in 1916, he supervised plans and construction of the present Coit road plant. Several years later he was made general superintendent of the entire product division, a post he held until he became manager of the Detroit sales division in 1924. After three years in Detroit he returned to Cleveland as a vice president, becoming executive vice president in 1933.

♦

David Barker Rushmore, 66, last week. Prior to his retirement in 1925 he was chief engineer, power and mining department, General Electric Co., Schenectady, N. Y., for 20 years. He was a member, American Society for the Advancement of Science, American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers, and many others.

Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ LABOR department's ruling on minimum steel wage for government work, recently upheld by United States Supreme Court in its decision against Lukens Steel Co., Coatesville, Pa., and others, will go into effect on or about May 24. Supreme Court attaches and government counsel explain exact date ruling goes into effect depends upon completion of court formalities.

Mandate, declaring Madame Perkins' steel wage ruling in accordance with the Walsh-Healey act, and enjoining Lukens Steel Co. and the other plaintiffs to abide by it, will be handed down to a lower court, May 24. Thence a further mandate must go to a second lower court. For this reason, it is explained, it is impossible to say when the new wages become effective.

Counsel for Lukens and the others involved has but one alternative as result of Supreme Court's decision, and that is filing of petition for reargument. Such petition must be filed not later than May 24. Court officials explain that only very rarely does Supreme Court grant reargument. Steel counsel stated here late last week it had not yet decided to ask reargument. Petition for reargument must be filed on or before May 24.

REPUBLIC STEEL PETITIONS SUPREME COURT FOR REVIEW

Republic Steel Corp., Cleveland, has petitioned Supreme Court to review former's labor board case growing out of the little steel strike. Supreme Court, April 8, had denied Republic's first review petition.

Petition asks Supreme Court to reconsider its decision in view of a recent circuit court decision published May 6, which is squarely in conflict with circuit court's decision in Republic's case on an important question of federal law.

Third circuit court of appeals upheld labor board's order requiring Republic to reimburse work relief projects for wages paid by such projects to striking employes. Meanwhile, Republic's petition points out, second circuit court of appeals held, in Leviton Mfg. Co.'s labor board case, that labor board has no authority to require an employer to make such reimbursement.

LOGAN-WALTER BILL PASSES SENATE JUDICIARY COMMITTEE

Senate judiciary committee last week unanimously decided to push Logan-Walter bill to final senate vote before this session of congress adjourns. Committee decision was made despite personal appeal by Senator Barkley, majority leader, for a delay.

Shortly before committee acted Senator Barkley urged its members to give measure further study and to await findings of the attorney general's committee on the bill's effects. Majority leader argued there is confusion as to measure's scope, justifying further hearings.

Course he suggested would have sidetracked bill for this session, however, since attorney general's study, requested by the President, is not expected to be completed before June 1. Senator Barkley said report would be completed in late summer or early fall.

Chairman Ashurst said 16 of the committee's 18 members were present and added:

"This committee was close to militant, and I asked each member for his judgment . . . It seemed to be the unanimous opinion of the committee that this responsibility should be met and not dodged and I personally agree."

In spite of administration opposition, bill passed house several weeks ago by a vote of better than 2 to 1, with a large contingent of Democrats supporting it.

Bill is expected to provoke extended debate on the floor but its supporters are confident it will pass. Senator Barkley indicated in the senate a few days ago he would advise presidential veto if it passes.

TNEC POSTPONES HEARINGS UNTIL AFTER ELECTION

Temporary national economic committee last week accepted its executive committee's recommendation and has postponed further hearings until after November election. Committee also decided to file with congress, before present session adjourns, a progress report showing number of hearings held, industries studied to date and outlining future plans.

With present session of congress drawing to a close and congressional members under pressure of other duties, committee agreed it has become impractical to hold further hearings until November. It proposes to hold an economic forum, at that time, at which outstanding business leaders and economists will be asked to give benefit of their experience and thinking in discussion of the nation's problems.

INVENTORY EXPANSION ARRESTED IN MARCH

Expansion of manufacturers' inventories, a major factor in the domestic business situation since the war started, was halted in March, according to commerce department.

Value of manufacturers' inventories April 1 was lower than March 1. Department's index stood at 110.3 April 1 as against 110.5 on March 1 (Jan. 1, 1939 = 100).

Survey reveals the inventory expansion which began last autumn added over $1,200,000,000 to the value of manufacturers' stocks.

March shipments were only 11 per cent larger than in March 1939, as compared to January and Feb-

ruary shipments which ran better than 20 per cent ahead of the same months a year ago. Aggregate shipments for the durable goods industries have been maintained at a rate higher than incoming business by deliveries against orders booked during previous months. March shipments in the major durable goods industries—where unfilled order backlogs are of particular significance in current operations—ranged from 13 to 23 per cent above a year ago, except for the transportation equipment group (including aircraft) which showed a rise of more than 80 per cent over March, 1939. In contrast, shipments in most of the important nondurable goods industries did not exceed their 1939 volume by as much as 10 per cent.

WAGNER PROPOSES BENEFITS FOR DISABLED WAGE EARNERS

Senator Wagner, New York, sponsor of the original social security act, has introduced a bill providing insurance benefits for wage earners permanently and totally disabled for causes not arising out of their employment. He says:

"This bill, providing systematic insurance protection for wage earners totally and permanently disabled before they reach the retirement age, would meet the economic needs of those who have hitherto been forgotten men of our social security system. The bill, with necessary technical changes, follows closely the proposal which I introduced last year when the revision of the social security act was under consideration. Benefits are payable to wage earners totally and permanently disabled, and covered by old-age and survivors insurance. Benefits are geared into the old age insurance system, including the allowances for dependents. For at least ten years, the added cost of these benefits would be comparatively small, and would be met out of the existing old age and survivors' insurance fund without any increase in the schedule of contributions by employers and employes in the present law."

GOVERNMENT BUYS 2104 SHORT TONS OF PIG TIN

Award of four contracts for an aggregate of 2104 short tons of pig tin, under the provisions of the strategic materials act, have been announced by the procurement division. Awards:

Caswell, Strauss & Co., New York, 112 short tons at 46.93 cents per pound; total $1,051,232, subject to a ½ of 1 per cent discount.

Wah Chang Trading Corp., New York, 100 short tons at 46.75 cents per pound; total $93,500.

C. S. Trench & Co., New York, 784 short tons at 47.20 cents per pound; total $740,096, subject to a ½ of 1 per cent discount.

American Metal Co. Ltd., New York, 100 short tons at 47.50 cents per pound; total $95,000. This award is contingent upon the contractor furnishing Amco brand tin smelted in this country from Bolivian ore.

WAGE-HOUR AMENDMENTS SHELVED BY HOUSE

House of representatives has recommitted to the labor committee all proposed amendments to the wage-hour act. After seven days debate the house voted down any action on the amendments and by sending them back to the committee has killed them for the present session.

The action is considered a major victory for the administration.

Completely ignoring party lines, the house first defeated, 211 to 171, a bill embodying alterations to the wage-hour act so drastic that it was estimated that a total of 3,000,000 workers would be withdrawn from protection of the wages and hours provisions. Then by a vote of 205 to 170, the original mild amendments introduced more than a year ago to alleviate hardship cases, were sent back to the labor committee.

EXPORTS TO SOUTH AMERICA ADVANCE 54 PER CENT

United States exports to the 20 republics of Latin America during the first six months of the European war amounted to $359,665,000, a gain of $125,464,000, or 54 per cent, as compared with the peace-time period from Sept. 1, 1938, to Feb. 28, 1939, according to the commerce department. Although all groups of commodities shared in the general increase, the gains were by no means uniform and were largely based on a higher volume of trade rather than on any sharp rise in unit values.

Greatest increase was in sales of metals and metal manufactures, which rose approximately $44,000,000, accounting for more than one-third of the total increase. Exports of machinery and vehicles, which generally represent the largest single classification in sales to the Latin American countries, showed a somewhat smaller gain than did metals.

The advance in these lines was retarded by the decline in shipments of farm machinery and implements and automotive units to Argentina, by the difference in types of aviation equipment being purchased by the several Latin American governments, and the prior orders for aircraft placed by the Allies in the United States. There was a sharp gain in orders for railway replacements and new rolling stock representing direct diversion of orders to the United States.

GERMANY LEADS WORLD IN PIG IRON PRODUCTION

Although no official statistics have been issued, it is known that industrial production in Germany during 1939 attained record levels in many instances, according to a report from the office of the American commercial attache, Berlin. Semiofficial estimates recently published in the German press place pig iron output of the old Reich last year at approximately 20,000,000 tons, which compares with production of 18,512,000 tons in 1938. To the 1939 total, however, should be added the production of Bohemia, Moravia and Poland, which amounted to 2,850,000 tons in that period. According to the press, the aggregate pig iron output of the German "sphere of interest" now amounts to more than 22 per cent of world production and exceeds that of any other country, including the United States.

Steel ingot output of Germany, including territories added to the German "sphere of interest" in 1939, is estimated at 30,950,000 tons, a volume which is said to be second only to that of the United States. Germany's production of aluminum in 1939 is estimated at 185,000 tons, or approximately 30 per cent of total world production of this metal.

The value of Germany's machinery output is estimated by semiofficial sources at 6,750,000,000 marks in 1939, a total which compares with 5,500,000,000 marks in 1938 and 4,500,000,000 marks in 1937.

GOVERNMENT WALSH-HEALEY PURCHASES TOTAL $732,845

During the week ended April 27, the government purchased $732,845.34 worth of iron and steel products under the Walsh-Healey act as follows: American Car & Foundry Co., New York, $247,390; Tophams Inc., Washington, $41,128.45; Virginia Bridge Co., Roanoke, Va., $22,616; Peco Mfg. Corp., Philadelphia, $23,287.34; United States Pipe & Foundry Co., New York, $12,541.90; Stevens Walden Inc., Worcester, Mass., $23,622.08; Oliver Iron & Steel Corp., Pittsburgh, $37,216.70; Whitehead & Kales, Detroit, $38,010; MacWhyte Co., Kenosha, Wis., $32,100.20; Warren Webster & Co., Camden, N. J., $34,656.37; Simonds Saw & Steel Co., Boston, $14,027.24; Chrysler Corp., Detroit, $178,348.50; Troy Chain Co., Troy, N. Y., $14,150.56; and James B. Clow & Sons, Chicago, $13,750.

Machine Tools Aid Planemakers Achieve Mass Production

■ AIRCRAFT manufacturers—turning from hand to mass production methods as rapidly as possible—are buying an increasing volume of machine tools. Conservative estimates are that more than 25 per cent of all machine tools produced for domestic use are delivered to planemakers or their suppliers. Several companies interviewed by STEEL reported between 35 and 40 per cent of their domestic sales were to the aircraft industry; one large company said 85 per cent of current deliveries are for aircraft account.

Many toolmakers say the aircraft industry now is shading the automakers in machine tool demand. Estimated needs of the plane builders now is for 4000 tools to cost about $35,000,000.

How rapidly the aircraft industry has grown as a tool market is indicated by the fact it took only 2 per cent of domestic sales in 1937; 10 per cent in 1938; and 20 per cent in 1939.

Typical of aircraft companies' expanding operations, Vultee Aircraft Inc., Downey, Calif., is planning production of its trainer, combat and pursuit planes to take full advantage of every production tool. In the last expansion program, floor space was increased from 150,000 to 335,000 square feet and $650,000 worth of machine tools was purchased.

Besides buying standard machine tools, Vultee has developed successfully for itself special purpose tools which give indications of becoming standards in the industry. These machines present further opportunities to machine tool and machinery builders.

A radial router has been developed with a rotary work table having four setup positions. Production was increased 250 per cent as this arrangement permits loading one position while work is being done at another and unloading at a third.

Rotary Feeding Platforms Used

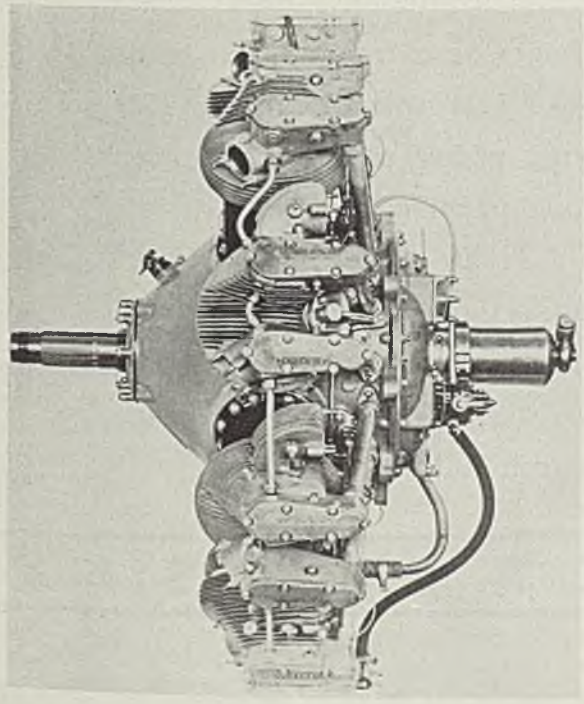
The motorized rotary feeding platform idea was also applied to a three-column hydraulic press and synchronized for automatic cycle operation. Loading platform has three positions—one for loading, one for pressing and one for unloading. Pressing operation is entirely automatic, with pressing head claimed to move 250 per cent faster than any previously used for aircraft work. As head rises after pressing operation, rotary table automatically swings around to bring loaded set of dies into pressing position.

A high-speed milling machine for light metal alloys also has been developed which is powered by a high-frequency electric motor to drive cutters at speeds up to 10,000 revolutions per minute compared to 2500 revolutions per minute on conventional metalworking mills. This machine has cut milling time on one piece from 30 hours to 115 minutes.

Inasmuch as the average plane requires around 45,000 rivets, much attention is being paid to automatic riveting. Vultee has installed an Erco automatic riveter which punches the hole, inserts the rivet and heads the rivet in one operation, doubling output per man. Several other aircraft companies are purchasing similar machines.

Although not a machine tool, but indicative of the trend to mass production and assemblies, the master jig is finding increasing application in aircraft plants. Through use of special jigs, steel tube frames can be arc welded without appreciable distortion. Vultee is using large cantilever frame type master jigs for electric welding of fuselage tubing which incorporate, besides the master jig, two sets of smaller jigs on rollers to permit work on both sides of the fuselage at once.

Aircraft Diesel Engine Offers New Economy



■ This new Guiberson diesel aircraft engine made by Guiberson Diesel Engine Co., Dallas, Tex., recently flew a plane 1500 miles from Dallas to New York at an average speed of 142 miles per hour and at a total fuel cost of $11.05, or at less than three-quarters of a cent per mile. Engine is rated at 310 horsepower and weighs only 620 pounds compared to the 320 horsepower gasoline engine weighing 570 pounds which it replaced. Estimated fuel cost with the gasoline engine would have been about 4 cents a mile. NEA photo

First Quarter Aircraft Exports Total $66,816,208

■ First quarter American aircraft exports reached a new high of $66,816,208 according to Secretary of Commerce Harry L. Hopkins. This is a 225 per cent gain over same quarter 1939. March exports were valued at $20,735,688, or 4 per cent above February. First quarter shipments to leading buyers:

France	$32,741,917
Australia	7,746,773
England	7,609,266
Canada	4,400,640
Finland	3,181,687
Sweden	2,357,470
Turkey	1,597,794
Norway	1,471,276
China	1,126,560
Dutch Indies	745,233

Piper Plane Production Up 49% in First Quarter

■ Production of private planes by Piper Aircraft Corp., Lockhaven, Pa., during first quarter of 1940 increased 49 per cent over same period of 1939, according to T. V. Weld, vice president. Total 1939 sales, highest achieved by a civil airplane manufacturer, was 1806 planes in the $1000 to $2000 price range. This represented 48.6 per cent of the 3715 civilian planes produced in United States last year, and 56 per cent of civil planes of less than 100 horsepower. Piper has scheduled production for 2500 "Cub" planes for 1940.

To stimulate private flying, company is offering a free 8-hour course of dual flight instruction by government-licensed instructors with each plane purchased, in the purchased plane.

ALWAYS READY FOR ACTION

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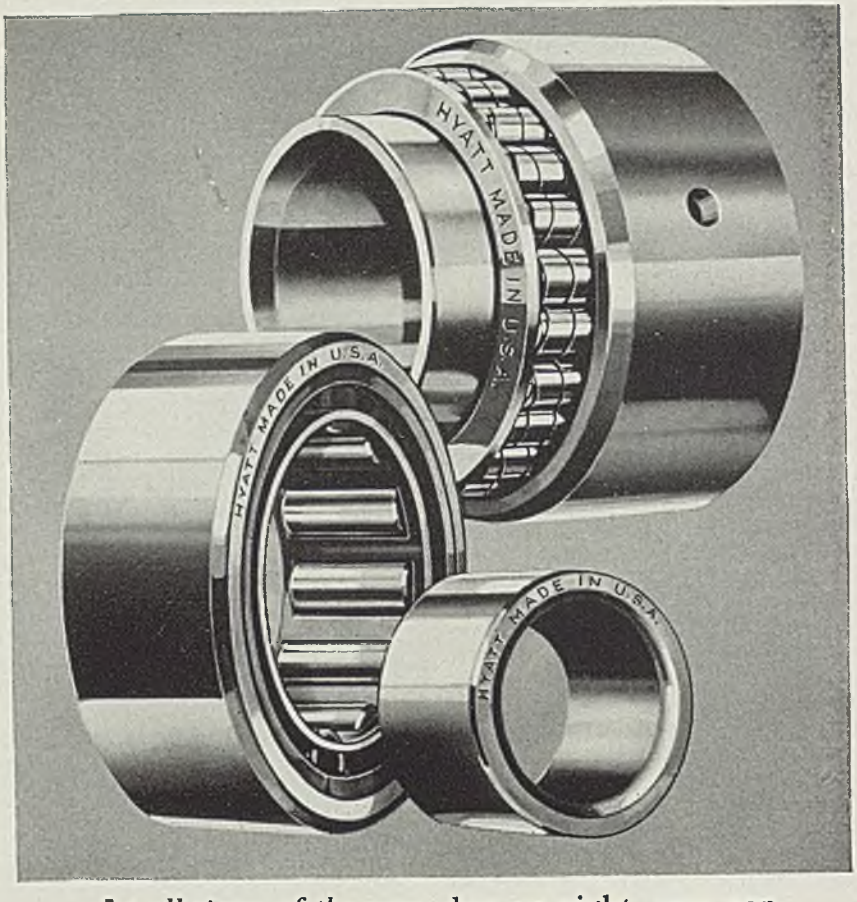

HYATT WOUND ROLLER TYPE and HY-LOAD SOLID ROLLER BEARINGS shown opposite. Inherent design advantages, uniformity and accuracy along with their capacity for heavy loads account for the widespread application of these better bearings.

At all times of the year, day or night, you can be assured that Hyattized equipment will carry through. Weather conditions, heavy loads, shocks, long hours or extreme speeds make no difference to Hyatt Roller Bearings. They have the staying power to keep equipment going, to prolong machine life.

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HYATT

ROLLER BEARINGS

QUIET

Mirrors of MOTORDOM

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ ACTIVITY in body die shops throughout the country is at fever pitch, and convincing proof is available that changes in new models are widespread. Even with the vast improvements in die fabrication methods which have taken place in the past few years, these shops are loaded to the gunwales with work this spring, and they will have to use extra pressure to meet deadlines for tryouts.

It may be interesting to review briefly the operations involved in shaping up some of the larger body dies, such as those for turret tops, fenders, wheel housings and the like. The first step in making a large punch and die set is the preparation of models. These are nearly all made of a special type of quick drying cement these days, instead of wood which has come to be too expensive and time-consuming to handle. A cement model can be made from the full-size clay model which styling departments build up before new car models go into production. The clay model is covered with a special grease to prevent sticking of the cement, a box is built up around the certain section for which a die is going to be made, and the cement poured over the pattern.

Cement for Die Molding

Since this cement costs as high as $50 a ton, and some models may weigh as much as 5 tons, every effort is made to conserve on cement; hence it is either cored out behind the impression, or only a thin layer is cast over the impression and steel rods are set into the cement to support the model when on the diecutting machine.

Occasionally a wood pattern will be made for either the punch or die, after which the cement can be poured over the pattern to make the other half of the set. These patterns are shaped up by expert patternmakers, usually working from sheet metal templets giving the proper contours at different sections across the piece.

Different Methods Used

Several types of equipment are used by die shops to "trace" or duplicate the cast iron die from the plaster model. One is the familiar Keller machine, in use now for almost 20 years for this type of work, though only recently refined to its present state of perfection and installed in both large and small shops. Another method involves use of standard types of machine tools—boring mills, lathe, milling machines—with special attachments to link the cutter with a tracer which moves across the face of the model, usually mounted adjacent to the work and in the same plane.

Chief difference between the two types is that the Keller machine provides accurate electrical control of three motions of the cutter, while the attachments usually only control one motion, leaving the other two to the machine operator. The latter ordinarily involve hydraulic control and have the advantage of being adaptable to standard types of machine tools and of being easily removed, while the Keller machine, considerably more expensive, is a single-purpose tool, completely automatic.

One type of hydraulic control is that made by Turchan Follower Machine Co. here in Detroit and shown in the accompanying illustration. An average size unit sells for around $3000 and there are perhaps 50 of them in use at the present time in various shops. Essentially, it comprises a tracer for following the contour of the model, the tracer point bearing against the model with 8-ounce pressure and being proportional in size to that of the cutter. Through a system of hydraulic valves, controls and pumps, the in-and-out motion of the tracer is transferred to identical motion of the cutter on the die. Speeds and feeds are regulated by the operator.

A third type of attachment is known as a universal duplicator and combines electric and hydraulic means to duplicate a die from a model. It is portable and may be attached easily to a lathe, planer, shaper, die sinker, boring mill, etc. Built by Detroit Universal Duplicator Co., the operation is essentially as follows: A motor-driven cam keeps a contact point in high speed vibration between two contact points in the tracer head. As the tracer finger follows the pattern, any movement brings the vibrating points into greater contact with one of two contact points. One of two solenoids, each connected with its corresponding point, controls the up or down position of a hydraulic valve plunger. This plunger valve diverts fluid under pressure from the hydraulic pump to the hydraulic motor. A driveshaft connected to this motor is connected with the feed of the machine tool it is operating.

Die Surface Is Hand-Finished

Even when the tracer is following a section of the pattern requiring no feed, electrical impulses continue and keep the solenoids in slight movement. However, these impulses are of such short duration and in such rapid sequence that they tend to neutralize each other so that no motion is transmitted to the machine tool.

Using either the completely automatic Keller machines, or the duplicating attachments, practice in form-

ing the large automotive dies is to make two series of cuts, roughing and finishing. Roughing cuts may be spaced as far apart as several inches and give the effect of a series of parallel gouges extending either horizontally or vertically across the die. After completely rough cutting the surface, the finishing cuts are started and are spaced much more closely together, with a smaller cutter used. Finish cuts are spaced somewhere around ½-inch apart if the roughing cuts are, say, 2 inches apart.

After the finish cuts, the surface still shows the series of closely spaced parallel gouges, the base or deepest part of each cut being the true surface of the finished die and thus providing a series of gage lines for the final grinding operations. Portable grinders are used to smooth down the "corrugated" surface to the point where the gage lines just show. Then large hand files must be used to get the surface down to its final smoothness.

At this point, the ingenuity of the skilled diemaker comes into play, for it is a long, tedious task to get a perfect fit between punch and die. The practiced die man can run his hand over the smooth iron surface and tell quickly where there is the slightest waviness. Prussian blue is smeared on the surface and the dies are placed in a tryout press. The dies are closed and opened, traces of blue being left where the two surfaces do not meet perfectly. Grinding, filing and rubbing are necessary to put the final touches on the dies before the first stampings are tried, and even then readjustment often is necessary because of wrinkling of the steel, or some difficulty.

One set of dies usually is sufficient for a model run, and these days duplicate sets are seldom held in reserve, because precision diemaking and finishing has practically ruled out breakage. Where large runs are encountered and at severe wear points in dies, the practice often is resorted to of putting in steel inserts. This is another laborious job, as the inserts must be doweled into place and must fit the die perfectly.

While the fabrication of large automotive dies is still a long drawn out affair, and a task full of headaches, machining practice today has eliminated much of the time formerly required, when surfaces had to be hogged down with an air chisel, with the only guide a templet and the operator's good judgment.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1938	1939	1940
Jan.	226,952	356,962	449,314
Feb.	202,597	317,520	421,820
March	238,447	389,495	439,911
April	237,929	354,266	.....
May	210,174	313,248	.....
June	189,402	324,253	.....
July	150,450	218,494	.....
Aug.	96,946	103,343	.....
Sept.	89,623	192,678	.....
Oct.	215,286	324,688	.....
Nov.	390,405	368,541	.....
Dec.	406,960	469,120	.....
Year	2,655,171	3,732,608	.....

Estimated by Ward's Reports

Week ended:	1940	1939†
April 13	101,940	88,050
April 20	103,725	90,280
April 27	101,405	86,640
May 4	99,305	71,420
May 11	98,480	72,375

†Comparable week.

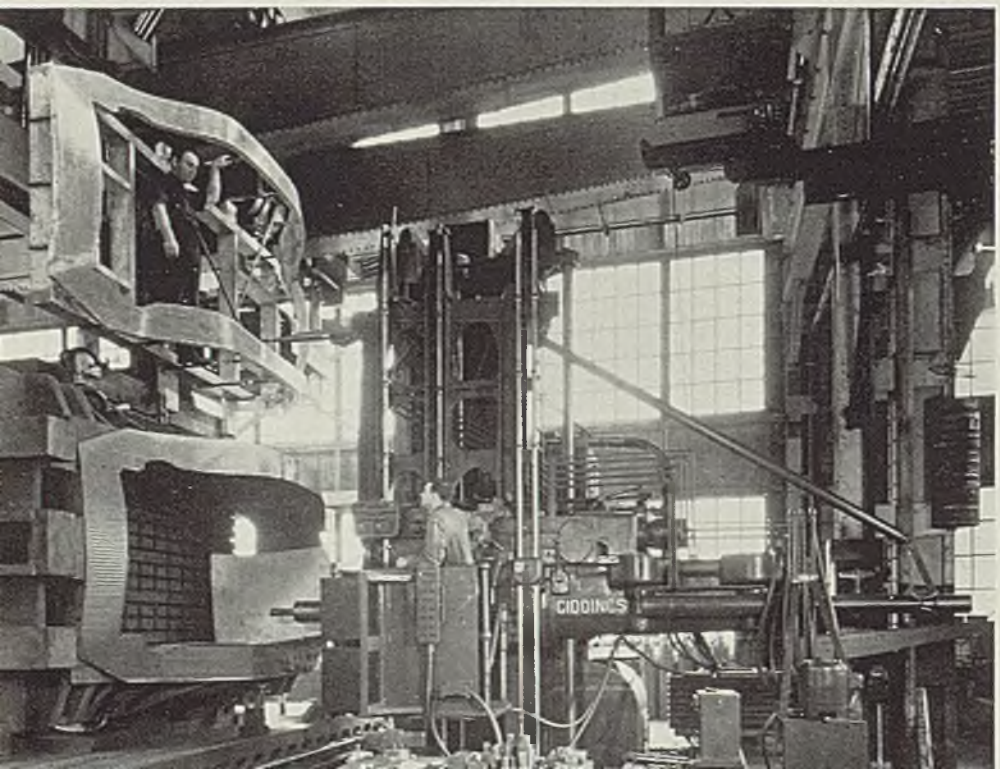
■ RESTRICTIONS placed on South African diamonds as a result of the European war have been reflected here in tighter supplies, 20 to 25 per cent higher prices, but no marked reduction in their use. All the motor companies, parts manufacturers, tool shops and other plants make some use of "bortz"—the technical term identifying industrial diamonds—in grinding, boring and similar operations. South African diamond supplies are controlled by a wealthy London syndicate which distributes them to brokers and dealers in Amsterdam and Antwerp. Embargoes have been placed on shipments from Antwerp and England, but supplies still are available from Amsterdam.

Pontiac Motor division, for example, reports use of "nearly a pound" of diamonds a year, which is a lot of diamonds, running 2300 carats to the pound and the average industrial diamond being 3 carats.

Brazilian diamonds, including the Brazilian carbonado or black diamond, are used to some extent industrially, but cost about 20 to 25 per cent more than African diamonds and are not available in as large quantities. Prices of these diamonds have increased "in sympathy" with the prices of African diamonds. Prices on African diamonds range from $1.28 per carat for crushing bortz, used in grinding wheels, up to $35 a carat for the high-grade stones. All industrial diamonds are actually rejects from stones examined for gem purposes.

Diamond sales interests in this country are "co-operating" with the British in preventing resale of industrial diamonds to enemy industry, although obviously there can be no strict regulation or licensing of domestic transactions.

Motor truck sales, while heavier than at this time last year, are not maintaining the increased pace of passenger car sales. Chevrolet reports for the first quarter show sales of 48,509 commercial cars, a gain of 3970 units or around 9 per cent over the same period last year.



■ Die duplicating attachment on large Giddings & Lewis boring mill, with pattern and die for hold-down ring of turret top die assembly mounted on the bed. Note tracer at center of lower edge of plaster model mounted above the cast iron die on which roughing cuts have just been completed. Photo courtesy Turchan Follower Machine Co., Detroit

Technology Opening New Fields. GM's Guests at Fair Told

■ AGGRESSIVE capitalization of technological progress is the only solution to the problem of higher living standards, asserted Alfred P. Sloan, General Motors Corp. chairman, last week. Addressing more than 550 executives, educators and college students at a dinner in the General Motors building, New York world's fair, marking beginning of the corporation's fair activities for 1940, Mr. Sloan declared only in that manner could workers' productivity be increased. This would enable industry to pay higher wages, and reduce prices of goods and services so that they could be brought within reach of an increasing number of people, he said.

Supported in his views by William S. Knudsen, General Motors president; General Hugh S. Johnson; Charles F. Kettering, General Motors vice president; Dr. Karl T. Compton, president, Massachusetts Institute of Technology; and Dr. Ernest M. Hopkins, president, Dartmouth college, Mr. Sloan reassured the college students that industrial progress built on research and technological advances will open new opportunities for the present generation far greater than in the past.

Intelligent management of affairs, said Mr. Sloan, will determine extent to which benefits available will be obtained. That 10,000,000 are unemployed today, that living standard is falling, and that industry's expansion has become decelerated is all the inevitable result of the nation's own actions, he pointed out.

"Sooner or later," stated Mr. Sloan, "we will learn that we are all a part of the same economy. We cannot penalize one group to provide a higher standard of living for the other. The only way the standard of living of the less privileged part can be advanced is to improve the standard of living of all other parts."

In addition to Mr. Sloan, Mr. Kettering and Mr. Knudsen spoke briefly on American youth's future opportunities. Pointing to past generations' inability to foresee the tremendous advance in modern industry Mr. Kettering stated it is futile "for us to try to imagine what the future will be like, let alone plan it. All we can do is prepare ourselves to take full advantage of what the future will bring. Our over-all ability is the only thing that really counts."

Mr. Kettering, the two college presidents and General Johnson constituted a board that undertook to answer questions submitted by the students. Provocative of lively discussion was the query: "Is it reasonable to expect expansion in industry alone to absorb the millions reported unemployed, plus college and high school graduates?"

Mr. Kettering declared that not only could proper industrial expansion take up all unemployment, but that if a lot of new things got under way, a shortage would result. General Johnson pointed out that if normal business expansion of 4.4 per cent annually had continued after 1929, industry alone would have found employment for additional 6,000,000 without taking into account associated services.

Steel Ingot Statistics

Period	Calculated Monthly Production—Open Hearth—Net tons	Open Hearth—Per cent of capacity	Bessemer—Net tons	Bessemer—Per cent of capacity	All Companies—Total—Net tons	All Companies—Total—Per cent of capacity	Calculated Weekly production, all companies net tons	Number of weeks in month
1940 Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.								
Jan.	5,369,601	86.40	285,714	56.10	5,655,315	84.11	1,276,595	4.43
Feb.	4,203,508	72.37	205,527	43.19	4,409,035	70.16	1,064,984	4.14
March	4,073,196	65.54	191,559	37.62	4,264,755	63.42	962,699	4.43
April	3,798,371	63.11	176,335	35.76	3,974,706	61.04	926,505	4.29
4 mos.	17,444,676		859,135		18,303,811		1,058,635	17.29
1939 Reported by Companies which in 1939 made 97.97% of Open Hearth and 100% of Bessemer.								
Jan.	3,413,783	55.35	165,080	27.22	3,578,863	52.83	807,870	4.43
Feb.	3,149,294	55.55	219,621	40.10	3,368,915	55.07	842,229	4.00
March	3,621,177	58.71	217,950	35.93	3,839,127	56.67	866,620	4.43
April	3,122,418	52.27	230,356	39.22	3,352,774	51.11	781,532	4.29
4 mos.	14,139,679		833,007		14,139,679		824,471	17.15
May	3,104,697	50.34	190,467	31.40	3,295,164	48.64	743,829	4.43
June	3,314,012	55.48	209,868	35.73	3,523,880	53.71	821,417	4.29
July	3,308,029	53.75	256,798	42.43	3,564,827	52.74	806,522	4.42
Aug.	3,965,515	64.29	276,479	45.58	4,241,994	62.62	957,561	4.43
Sept.	4,436,792	74.45	332,676	56.77	4,769,468	72.87	1,114,362	4.28
Oct.	5,626,585	91.22	453,492	74.77	6,080,177	89.75	1,372,500	4.43
Nov.	5,694,788	95.34	452,995	77.12	6,147,783	93.71	1,433,050	4.29
Dec.	5,468,880	88.87	353,134	58.35	5,822,014	86.13	1,317,198	4.42
Total	48,226,070	66.43	3,358,916	47.05	51,584,986	64.70	989,355	52.14

The percentages of capacity for 1939 are calculated on weekly capacities of 1,392,331 net tons open hearth ingots and 136,918 net tons Bessemer ingots, total 1,529,249 net tons; based on annual capacities as of Dec. 31, 1938, as follows: Open hearth ingots, 72,396,153 net tons; Bessemer ingots, 7,138,880 net tons.

The percentages of capacity operated for 1940 are calculated on weekly capacities of 1,402,899 net tons open hearth ingots and 114,956 net tons Bessemer ingots, total 1,517,855 net tons; based on annual capacities as of Dec. 31, 1939 as follows: Open hearth ingots, 73,343,547 net tons; Bessemer ingots, 6,009,920 net tons.

U. S. Steel Subsidiaries Show New Film at Fair

■ "Men Make Steel," a new technicolor film relating the story of steelmaking, will be shown at frequent intervals throughout the summer at the air-conditioned moving picture theater added to United States Steel subsidiaries' exhibit, New York world's fair. Picture depicts actual operations in manufacture of steel, from ore mines to rolling mills and finished forms.

Dioramas visualizing possible future developments in steel application are also exhibited. Pre-fabricated steel housing, an imaginative hydrophonic tomato farm representation, and a working model of the future city are featured.

Research section illustrates by actual demonstration important role research plays in steel manufacture. Other displays, including a mural executed in steel sheets, show many uses of steel and its importance in modern life.

April Ingot Output Down 7 Per Cent from March

■ Open-hearth and bessemer steel ingots produced in April totaled 3,974,706 net tons, a decline of 7 per cent from March, but 19 per cent more than in April, 1939, according to the American Iron and Steel institute. Revised figure for March was 4,264,755 net tons and for April, 1939, it was 3,352,774 tons.

April production was at the rate of 61.04 per cent of capacity, compared with revised rates of 63.42 per cent in March and 51.11 per cent in April, last year. Steel ingot production averaged 926,505 tons per week in April.

Production for four months this year totaled 18,303,811 net tons, compared with 14,139,679 tons in the corresponding period last year.

In the accompanying table the institute has revised all figures for 1939 and 1940, based on the new capacity figures announced late in February. (STEEL, March 4, page 33.)

U. S. Steel's Export Business 13 Per Cent of Total Shipments

■ EXPORT business is contributing increasingly to United States Steel Corp.'s bookings, Edward R. Stettinius Jr., chairman, told stockholders at corporation's annual meeting in Hoboken, N. J., last week. Finished steel exports in 1939, he said, aggregated approximately 9 per cent of total tonnage shipments, compared with about 13 per cent to date this year.

Mr. Stettinius said the corporation exported 705,000 tons of steel in first eight months last year and 582,000 in remaining four. Export shipments during first 1940 quarter totaled 462,000 tons. It is noteworthy, he commented, that much of the increase has been due to diminishing competition from foreign sources in neutral countries as a result of war, rather than to belligerents' direct war needs.

Although it spent $26,000,000 for property improvements last year, United States Steel Corp. has not, nor is planning to alter or enlarge its facilities for war business, Mr. Stettinius assured stockholders. He said that if all steel tonnage contemplated under the government's naval armament program over next few years were placed with the corporation it would absorb only about 1 per cent of latter's finishing capacity as of last year.

Among items included in the corporation's expansion activities last year Mr. Stettinius mentioned acquisition of properties and assets of Boyle Mfg. Co., Los Angeles, steel drum, pail and barrel manufacturer. It was recently decided, Mr. Stettinius continued, to round out and complete the corporation's modernization program in connection with tin plate facilities at Birmingham, Ala., Pittsburgh and Chicago districts. In the Pittsburgh district, cold-reduced black plate production at Irvin works will be increased by installation of another cold-reduction mill and processing equipment. At Birmingham, plan calls for additional processing and finishing equipment in the tin mills.

Carnegie-Illinois Steel Corp., in Chicago district, will install additional processing and finishing equipment at Gary, Ind., sheet and tin mill. It is negotiating for purchase of tinning equipment from Continental Can Co., New York, but does not intend to enter canmaking business.

Rapid development of the corporation's stainless steel division was cited by Mr. Stettinius. Since it was formed, in 1936, to co-ordinate manufacturing and sales activities of all subsidiaries engaged in that field, corporation has moved from tenth to third position in tonnage volume. Stainless steel shipments to consumers have multiplied about 600 per cent since 1932.

R. E. Zimmerman, vice president, outlined for stockholders present the corporation's advancement in research. Development of appropriate steel types for use in construction of houses, aircraft and rolling stock was furthered during 1939. New magnetic mechanism, which employs wholly new features for lean ore concentration, now under development and "showing outstanding promise in connection with the problem," was discussed by Mr. Zimmerman.

He also referred to: Austempering, a new heat treating process; use of "sponge iron" for powder metallurgy; improvement in silicon alloy steel magnetic properties; ferrostan, an electrolytically coated tin plate; pyrometer, a device for measuring temperature of liquid steel in open hearth furnaces.

Direct continuous casting of semi-finished steel is also important, he said, along with use of oxygen in blast furnaces, elimination of surface defects from ingots, development of new alloys for high temperature service and production of rolls with greatly superior surfaces.

It is necessary, said Mr. Zimmerman, for steel research engineers, to keep a weather eye on all significant developments in competitive fields involving not only nonferrous metals, but materials such as synthetic resins and plywood as well.

One stockholder, J. N. Blackman, contended stockholders, as well as management and employes, were entitled to collective bargaining, and urged the management to fight more aggressively for their rights. Questioned by him as to reason for recent price reduction, Mr. Stettinius declared it was necessary for the corporation to maintain its competitive position.

Replying to another question anent development of a steel plant in Brazil Mr. Stettinius reported United States Steel Corp. is not planning to proceed with development of a steelworks in that country.

Major Steelmaking Units Incurred Loss in 1939

■ Principal steelmaking subsidiaries of United States Steel Corp., New York, and Bethlehem Steel Corp., Wilmington, Del., incurred net losses in 1939, according to reports filed with the securities and exchange commission.

Carnegie-Illinois Steel Corp., U. S. Steel's subsidiary and largest steel manufacturing unit in the world, recorded a loss totaling $18,888,206. American Steel & Wire Co., another large subsidiary, reported a $4,537,820 loss. Bethlehem Steel Co. of Pennsylvania, Bethlehem Steel Corp.'s subsidiary, last year had a loss of $490,338 after interest payments. Bethlehem Steel Co. of Delaware lost $121,534; Bethlehem Steel Export Co., $20,871; and Fore River Railroad Co., $4000.

United States Steel Corp. received cash dividends aggregating $39,536,312 from its subsidiaries last year, in earnings of which companies the parent corporation had an equity totaling $34,217,095. Largest dividend payment, $5,883,043, came from Tennessee Coal, Iron & Railroad Co.; Duluth, Missabe & Iron Range Railway Co. contributed $5,140,625; Pittsburgh Steamship Co., $4,914,000; Lake Superior Consolidated Iron Mines, $3,000,000; National Tube Co., $2,800,000; Neville Iron Mining Co., $2,000,000; Bessemer & Lake Erie Railroad Co., $2,500,000; Elgin, Joliet & Eastern Railway, $1,910,000; Columbia Steel Co., $1,600,000; Universal Atlas Cement Co., $1,470,000 and Minnesota Iron Co., $1,000,000.

Bethlehem Steel Corp., the holding company, derived $29,176,320 income from interest payments on promissory notes and other obligations from subsidiaries. Largest profit came from Bethlehem-Chile Iron Mines, $1,055,084. Other profits included Calmar Steamship Corp., $829,089; South Buffalo Railway, $474,098; Bethlehem-Cuba Iron Mines, $472,006 and Bethlehem International Supply Co., $385,891.

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will award service emblems to more than 21,000 employes in recognition of ten or more years' service with the company. Eight employes have been with Westinghouse 50 or more years; 184 at least 40 years; and 6062 for 15 years or more.

For a Chicken in Every Pot

■ IN A thought-provoking article in the May issue of *Readers Digest,* Franzy Eakin and William Hard declare that an "Economic Congress" is needed to combine all our economic elements in "progressive cooperative energy against governmental totalitarianism".

Saying the country needs true economic leadership, they hold we cannot have it as long as manufacturers of consumer goods, manufacturers of producer goods, wholesalers, retailers, rail carriers, motor carriers, water carriers, AFL labor, CIO labor, milk farmers, cotton farmers, other sorts of farmers, work at cross-purposes or fight each other.

Under such conditions, they point out, the only leadership we really have is political leadership. They fear that "political leadership ultimately will swallow all our economic elements into the stomach of the state unless in private economic life we have a concerted leadership that can stand up against it".

Many Problems Press for Solution By Proposed Economic Congress

The suggestion is made by the authors that the $80,000,000,000 national income which the President has held up as the ideal objective—because it would produce tax revenue that would balance the budget —would not be sufficient to elevate the standard of living to what they call the "Middle American Ideal". Carefully figuring all expenses for an average American family they calculate that the national income required to support the plane of living on this standard would require an income of at least $105,000,000,000.

In order to achieve such an objective the authors believe that an Economic Congress would have to reach agreement on such questions as: What should we do about investment? What should we do about improved industrial plants? What should we do about improved labor power? What should we do about improved agricultural markets? What should we do about improved transportation facilities? What should we do to make all our economic elements mesh together as a gear-train that will turn and not stall?

While this idea is not wholly new, it probably never before has been presented so intriguingly. To many, the suggestion of an Economic Congress—representing industry, capital, labor, the farmer and business in general—may seem fantastic. But is it?

Influence of Pressure Groups Could Be Removed from Political Arena

As a matter of fact much progress already has been made along these lines. Take, for example, a typical annual meeting of the National Association of Manufacturers. The speakers will include not only manufacturing executives, but a liberal assortment representing other activities, such as one or two government men, an educator, a research worker, a dirt farmer, a banker and the like. The same is true of many other gatherings.

Properly organized, an Economic Congress might well prove to be an effective means for consolidating the position of business as a whole with respect to the national policy. It might be the means of compromising selfish desires of many existing pressure groups and, by eliminating such issues from politics, make it possible for candidates for public office to be less subservient to pressures of one kind or another. The idea is worthy of serious consideration. Such an Economic Congress undoubtedly could be organized effectively if a comparatively small number of influential men would initiate the movement and then vigorously push it on to realization.

The BUSINESS TREND

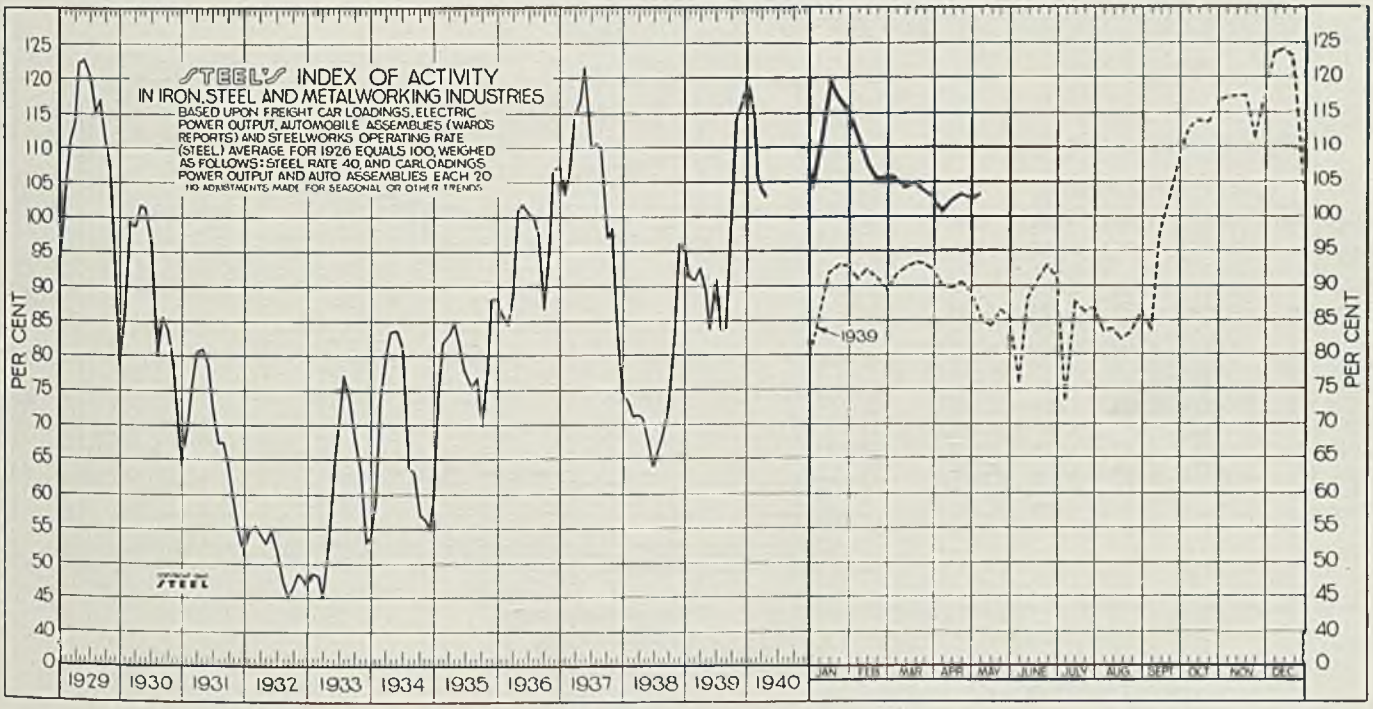
Some Business Indicators Record Moderate Gains

ADDITIONAL improvement in some industrial lines developed last week, indicating a more pronounced leveling off of the general business trend with the possibility of an upward movement starting soon.

Particularly significant at this time is the encouraging improvement recorded in steelmaking operations the past two weeks. However, too much stress should not be placed on the recent upturn in the national steel rate, for it is probable that a considerable portion of the sheet and strip orders placed in recent weeks have been at the expense of business later on this year.

STEEL's index of activity gained 0.5 point to 103.3 during the latest period and compares favorably with the 85.1 level recorded by the index in the corresponding week last year. Improvement in revenue freight carloadings and steelworks operations more than offset the seasonal tapering off in electric power consumption and automobile production during the week ended May 4.

Other encouraging factors in the current outlook are the slight improvement in steelworks scrap composite and the increase in private construction awards placed during April.



STEEL'S index of activity gained 0.5 points to 103.3 in the week ended May 4:

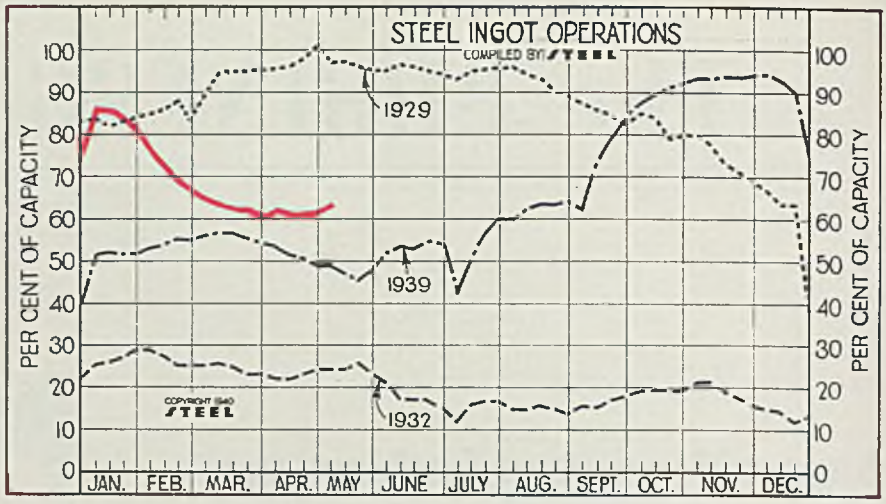
Week Ended	1940	1939
Feb. 24	105.4	89.3
Mar. 2	105.6	91.5
Mar. 9	104.7	92.7
Mar. 16	104.9	93.3
Mar. 23	103.7	93.2
Mar. 30	103.2	92.2
Apr. 6	101.8	90.0
Apr. 13	102.7	89.7
Apr. 20	103.4	90.4
Apr. 27	102.8	89.2
May 4	103.3	85.1

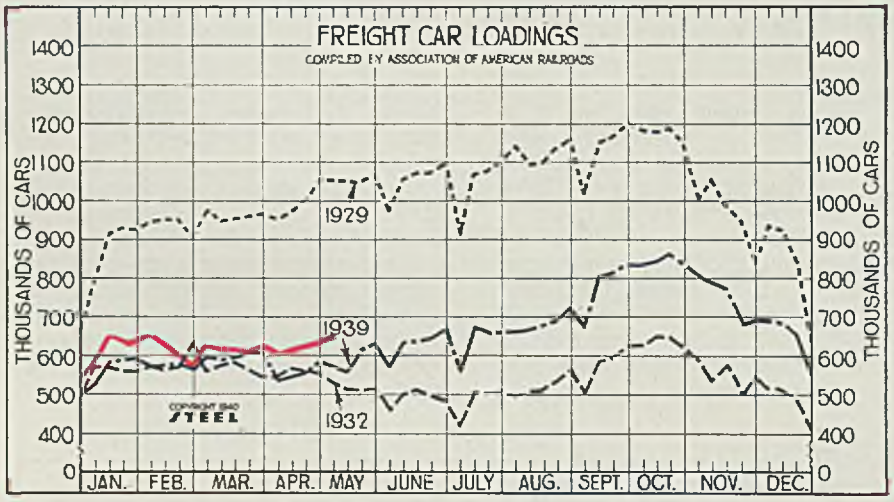
Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	.....	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	.....	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	.....	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	.....	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	.....	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	.....	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	.....	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

Steel Ingot Operations

(Per Cent)

Week ended	1940	1939	1938	1937
Feb. 3....	76.5	53.0	31.0	79.5
Feb. 10....	71.0	54.0	30.0	81.0
Feb. 17....	69.0	55.0	31.0	83.0
Feb. 24....	67.0	55.0	30.5	84.0
Mar. 2....	65.5	56.0	29.5	86.0
Mar. 9....	63.5	56.5	30.0	87.0
Mar. 16....	62.5	56.5	32.0	89.0
Mar. 23....	62.5	55.5	35.0	90.0
Mar. 30....	61.0	54.5	36.0	91.5
Apr. 6....	61.5	53.5	32.0	91.5
Apr. 13....	61.0	51.5	32.0	91.5
Apr. 20....	61.5	50.5	32.5	91.5
Apr. 27....	61.5	49.0	32.0	91.0
May 4....	63.5	49.0	31.0	91.0





Freight Car Loadings

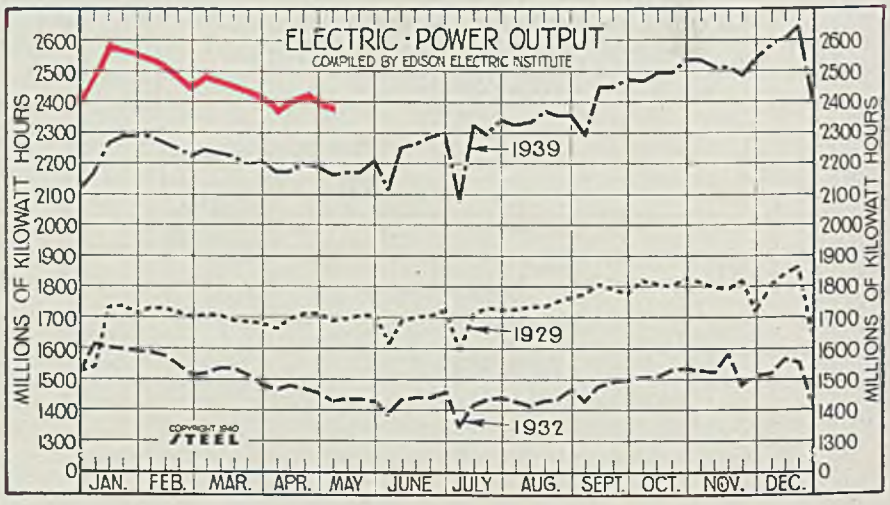
(1000 Cars)

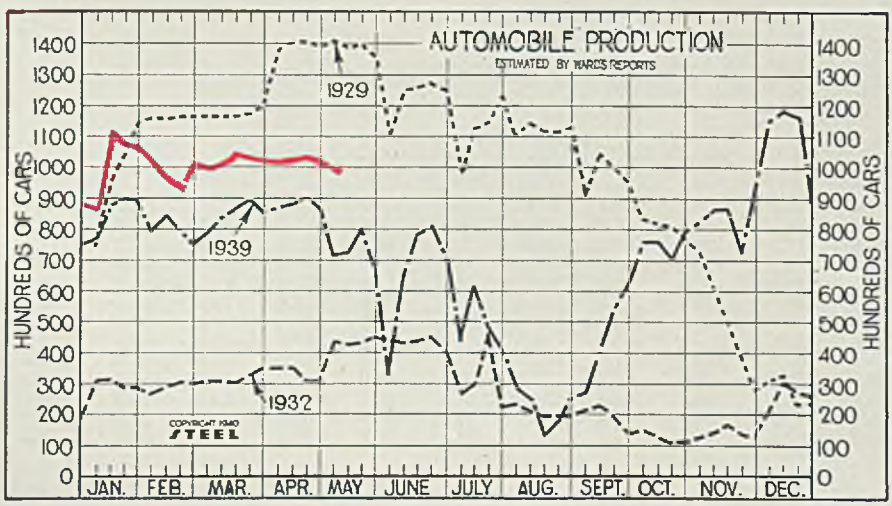
Week ended	1940	1939	1938	1937
Feb. 3.....	553	577	565	675
Feb. 10.....	627	580	543	692
Feb. 17.....	608	580	536	715
Feb. 24.....	595	561	512	697
Mar. 2.....	634	599	553	734
Mar. 9.....	621	592	557	749
Mar. 16.....	619	595	540	759
Mar. 23.....	620	605	573	761
Mar. 30.....	628	604	523	727
Apr. 6.....	603	535	522	716
Apr. 13.....	619	548	538	751
Apr. 20.....	628	559	524	761
Apr. 27.....	645	586	543	782
May 4.....	666	573	536	767

Electric Power Output

(Million KWH)

Week ended	1940	1939	1938	1937
Feb. 3...	2,541	2,287	2,082	2,201
Feb. 10...	2,523	2,268	2,052	2,200
Feb. 17...	2,476	2,249	2,059	2,212
Feb. 24...	2,455	2,226	2,031	2,207
Mar. 2....	2,479	2,244	2,036	2,200
Mar. 9....	2,464	2,238	2,015	2,213
Mar. 16...	2,460	2,225	2,018	2,211
Mar. 23...	2,424	2,199	1,975	2,200
Mar. 30...	2,422	2,210	1,979	2,147
Apr. 6 ...	2,381	2,173	1,990	2,176
Apr. 13...	2,418	2,171	1,958	2,173
Apr. 20...	2,422	2,199	1,951	2,188
Apr. 27...	2,398	2,183	1,939	2,194
May 4....	2,386	2,164	1,939	2,176

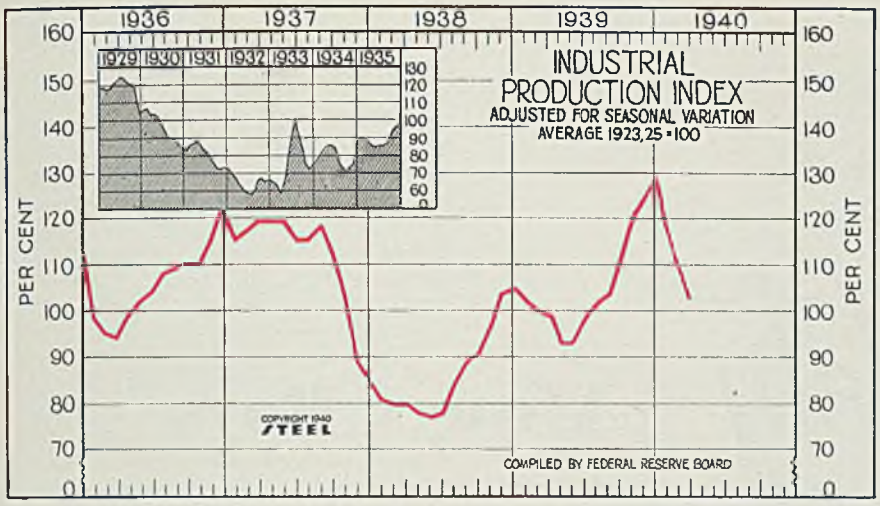




Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
Feb. 3....	101.2	79.4	51.4	72.3
Feb. 10....	96.0	84.5	57.8	72.8
Feb. 17....	95.1	79.9	59.1	95.7
Feb. 24....	102.6	75.7	57.0	111.9
Mar. 2....	100.9	78.7	54.4	127.0
Mar. 9....	103.6	84.1	57.4	101.7
Mar. 16....	105.7	86.7	57.5	99.0
Mar. 23....	103.4	89.4	56.8	101.0
Mar. 30....	103.4	86.0	57.5	97.0
Apr. 6....	101.7	87.0	70.0	99.2
Apr. 13....	101.9	88.0	62.0	125.5
Apr. 20....	103.7	90.3	60.6	133.2
Apr. 27....	101.4	86.6	50.7	139.5
May 4....	99.3	71.4	53.4	140.2



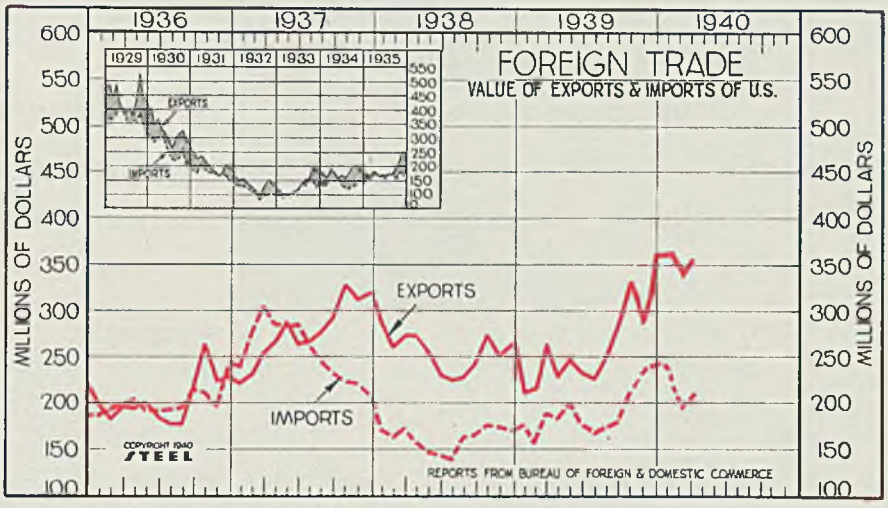
Industrial Production
Federal Reserve Board's Index

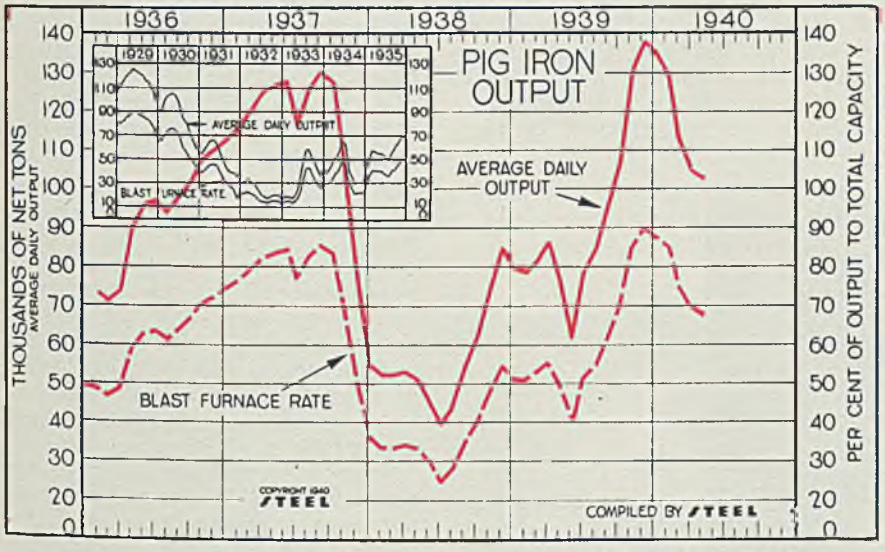
(1923-25 = 100)

	1940	1939	1938	1937	1936
Jan.	119	101	80	114	98
Feb.	109	99	79	116	94
Mar.	103	98	79	118	93
April	...	92	77	118	98
May	...	92	76	118	101
June	...	98	77	114	103
July	...	101	83	114	107
Aug.	...	103	88	117	108
Sept.	...	111	90	111	109
Oct.	...	120	96	102	109
Nov.	...	124	103	88	114
Dec.	...	128	104	84	121
Ave.	...	106	86	110	105

United States
Foreign Trade
(Unit: $1,000,000)

	Exports 1940	Exports 1939	Imports 1940	Imports 1939
Jan.	$368.6	$212.9	$241.9	$178.2
Feb.	347.0	218.6	199.8	158.0
Mar.	352.3	267.8	216.7	190.5
April	.....	231.0	.....	186.3
May	.....	249.5	.....	202.5
June	.....	236.1	.....	178.9
July	.....	229.6	.....	168.9
Aug.	.....	250.8	.....	175.8
Sept.	.....	288.6	.....	181.5
Oct.	.....	332.1	.....	215.3
Nov.	.....	292.7	.....	235.4
Dec.	.....	367.8	.....	247.0
Total	.....	$3,177.0	.....	$2,318.3





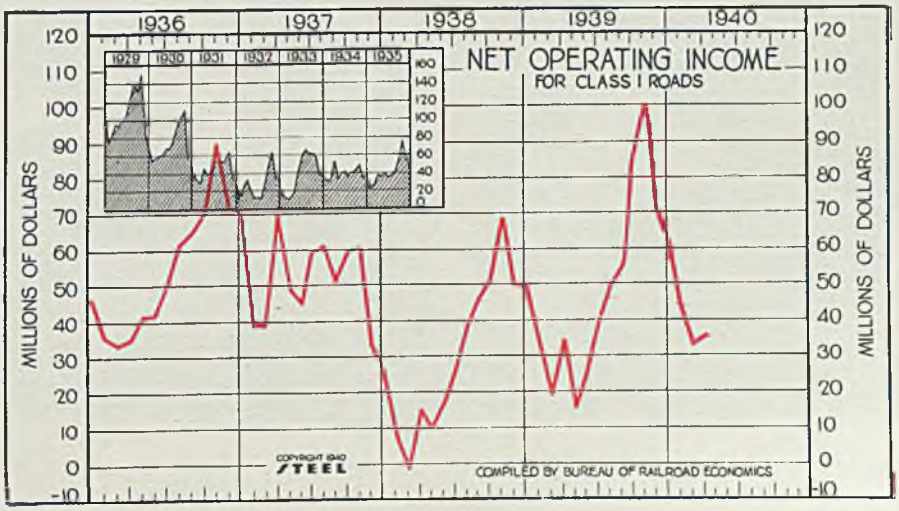
Pig Iron Production

	Daily average Net Tons 1940	1939	1938	Blast furnace Rate (%) 1940	1939	1938
Jan.	129,825	78,596	52,201	85.4	51.0	33.6
Feb.	113,943	82,407	52,254	75.0	53.5	33.6
Mar.	105,502	86,465	53,117	69.5	56.1	34.2
Apr.	104,635	76,732	51,819	68.9	49.8	33.4
May	.....	62,052	45,556	....	40.2	29.4
June	.....	79,125	39,601	....	51.4	25.5
July	.....	85,121	43,827	....	55.0	28.2
Aug.	.....	96,122	54,031	....	62.4	34.8
Sept.	.....	107,298	62,835	....	69.7	40.5
Oct.	.....	131,053	74,697	....	85.2	48.0
Nov.	.....	138,883	85,369	....	90.3	55.0
Dec.	.....	136,119	79,943	....	88.5	51.4
Av.	.....	86,375	51,752	....	62.6	37.3

Class I Railroads
Net Operating Income
(Unit: $1,000,000)

	1940	1939	1938	1937
Jan.	$45.57	$32.89	$7.14	$38.87
Feb.	32.62	18.59	1.91*	38.78
Mar.	36.73	34.32	14.73	69.88
April	.....	15.26	9.40	48.36
May	.....	25.10	16.67	44.24
June	.....	39.10	25.16	59.35
July	.....	49.01	38.43	60.99
Aug.	.....	54.59	45.42	50.76
Sept.	.....	86.43	50.36	59.62
Oct.	.....	101.62	68.57	60.86
Nov.	.....	70.35	49.67	32.44
Dec.	.....	60.95	49.37	25.99
Average	.....	$49.02	$31.02	$49.18

*Indicates deficit.



Safety Always Pays

This company saved 30 per cent in insurance costs and, with its "good housekeeping" program, reduced its visiting nurse's calls 50 per cent. Savings netted paid for the entire campaign

By G. W. CANNON
Vice President
Campbell, Wyant & Cannon Co.
Muskegon, Mich.

A GOOD safety program is good business—that is how Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., summed it up after five years of success with a safety and health campaign that netted a 30 per cent saving in insurance costs and, from a humanitarian viewpoint which interests this company most, has created a happier, healthier group of workmen.

In many cases, the only opposition to acceptance of an organized medical and hygiene program is the belief it is economically impossible for any but the largest companies. This plan, however, not only reduced the cost of liability insurance, but created a saving sufficient to pay for the entire health and safety program.

Doctors check carefully results of X-ray examinations and dictate findings for a permanent record

No matter how this subject is approached—whether from a humanitarian viewpoint or whether from the standpoint of a net saving in operating expense, records of Campbell, Wyant & Cannon prove that a well organized health, safety and good housekeeping program actually pays. In addition, it brings about a more closely knit organization. Employes like it. They realize the company has their interests at heart.

Because of the vigilance exercised by this company's supervision and medical department, the visiting nurse's calls have been reduced approximately 50 per cent in the past three years—and she still calls on every absentee. Much illness has been prevented and many lives saved because the service takes care of employes *before* a health or accident problem becomes serious.

Even before the prospective employe is hired, the employment department in co-operation with the medical division checks carefully his physical condition. The company found it is more important to fit the man with a job according to his physical attributes, than to place him properly after a casual exterior "once over" as the practice had been.

In order that the company might have the best possible system of making health examinations, the methods by employers of 500,000 men were checked, including both the nation's large and small indus-

From a paper presented at the National Association of Manufacturers Congress of American Industry, Waldorf Astoria hotel, New York, December 1939.

tries. Then it went beyond what some of them do. This is particularly true on rechecking men, and on blood tests.

An instance showing how deep an obligation this company feels towards each of its employes is the one concerning the man who came to them not knowing he had a hernia. The company first made him sign a statement acknowledging his condition. Next, he became a member of the Aid association, paying in $1 a month for its benefits. He then was put to work for the next six weeks. At the end of that time he was eligible for the benefits of the association.

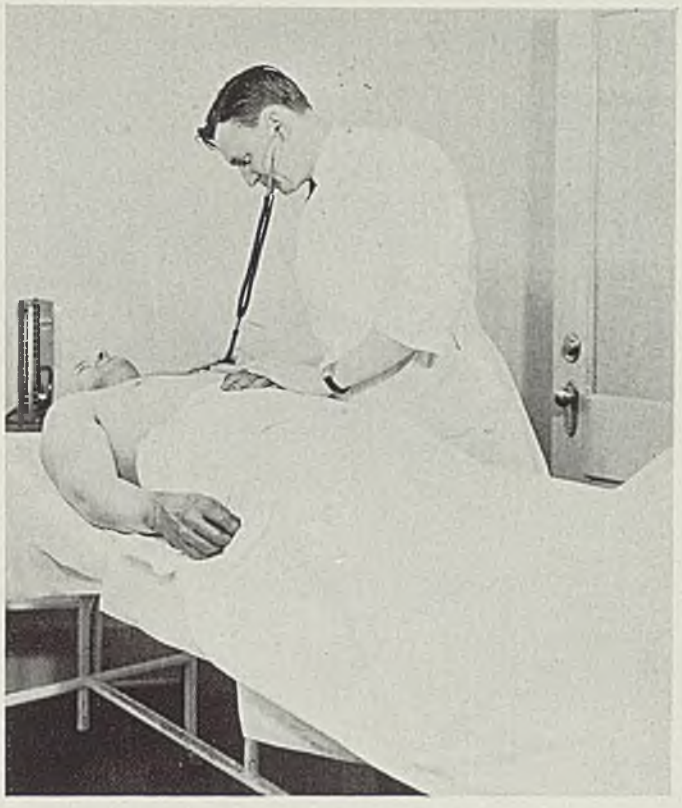
Receives Benefits

He was operated on by a surgeon of his own choice. During his absence he received benefits of $2 per day. When fully recovered, he came back to work, a useful man.

Payment for his operation was then deducted from his regular pay check at the rate which he could afford to pay.

The medical attendants always strive to make workers feel welcome. They try to impress on them that they are there to help them. Incidentally, this department is run as ethically as any good doctor's office and enjoys the good will of the profession throughout the city.

Preliminary examinations are divided into three parts—the history, physical examination and the laboratory procedure. The man's history is taken on a regular form signed by the applicant and verified for the company's records by the attendant. Complete physical examination includes an X-ray of the chest, a Kahn blood test and a urine test. It also includes an arrangement for periodic re-examination. With its method of classification in different health groups, this company is able to see that the substandard groups receive more medical supervision than the normal vigorous worker.



Each employe undergoes a complete physical examination. This includes a Kahn blood test and urine examination

Because the company discovered that its employes do not consult a physician unless they are actually incapacitated, and that they *will* seek advice and assistance from the company medical department for mild disorders, the medical department attempts to perform a function in diagnosing disease.

Many of these disorders are insignificant but some signify the beginning of a dangerous condition. It is in these cases the industrial physician has an opportunity for early diagnosis, preventing worse developments. Practice of the company in a case of this kind is to refer these patients to their family physician and see by follow-up that they consult him.

For the past five years the company has been educating its employes on the personal value to them of the shop slogan "Safety Always Pays." That they are becoming increasingly conscious of this fact is indicated by the following record: In 1935 its per cent of hours lost to hours worked was 1.73 per cent. In 1938 this was down to 0.04 of 1 per cent and 0.02 of 1 per cent in the first 10 months of 1939.

Lost time accidents were as follows: In 1935, 213, to 49 in 1938 and only 30 in the first 10 months of 1939, or 1/7 of the number of accidents in 1935.

For 10 months in 1939 the man hours have been increased by some 125,000 over the total for 1938 in spite of which the hours lost due to accident as compared to hours worked is just one half of the 1938 record. The safety department maintains that this record is largely a result of the physical examination.

To secure "no lost time" accident

Prospective employe's history is taken by a medical clerk, signed by applicant and verified for the company's records by the attendant

records a spirit of competition has been developed. Because of their desire to keep a good safety rate, the employes now even help newcomers until they have mastered their jobs.

Knowing that a safety program cannot be successful without "good housekeeping," the company also stresses this phase of its campaign equally as hard as the safety program.

Each department is furnished with a "good housekeeping" record card marked daily by the safety inspector. Monthly prizes with a letter of commendation, plus the privilege of displaying a bronze plaque for winning first, second or third place, creates a competitive spirit that keeps the contestants alert and interested.

Proper lighting, heating and ventilation are carefully checked. Light meters assist in maintaining proper illumination. Sufficient heat must be furnished to create bodily comfort. General plant ventilation is under the control of a *trained* man for each shift. Dust counts are taken by a staff chemist and control corrections are made continuously.

Brightly illuminated rest rooms, often repainted, have stopped previous malicious destruction of fixtures. A large portable vacuum cleaner removes dust and dirt throughout the foundry, creating better, healthier working conditions and a decreased occupational disease coverage cost.

The company insists that all injured employes go to the First Aid department regardless of how slight the injury. This applies equally to any employe suspected of running a temperature.

The Aid society is *entirely independently* operated and controlled by the employes. Membership costs each man $1 per month. He can receive benefits totaling $120 a year for three years. At the end of 90 days continuous active service, each man gets $500 group life insurance. In 9 months this is increased to $750; in 15 months to $1000—all of this at no added cost. His dollar each month is supplemented by an equal contribution from the company.

Nurse Also Aids Families

As part of the aid service, a nurse calls at the employe's home when he is absent from work. If necessary, she suggests that the family physician be called. The association arranges for financial and medical help when needed. The nurse calls each day or as needed until the employe recovers. She also helps out in illness of the wives and children. For this service the employes and their families have only the highest praise to offer.

Safety and safe working conditions are a matter of *education* and must have the wholehearted support and co-operation of management, supervision and workers.

One of the important steps this company takes in selling its program is through the columns of its monthly shop magazine. Here, beside shop material, much of the N.A.M. information on suggestions for improved health and safety methods is used as well as similar material found in other magazines.

All this activity has brought the company's workers and management closer. The employes like the program and seem anxious to correct physical defects found in the course of the examinations.

As a result of this program the foundry is actually insuring its entire liability at a lower net cost besides enjoying an immense amount of satisfaction for the many lives and homes saved.

One of the most important steps this company takes in selling its health and safety campaign to the employes is publicity. It carries on a campaign in its shop magazine assisted by other devices such as the bulletin board below

Size Finding Scale

■ A device whereby the most suitable washer size can be selected to satisfy a given design or assembly requirement, is announced by Wrought Washer Mfg. Co., 2100 South Bay street, Milwaukee. Offered without charge to rated firms, it makes possible a speedy comparison of the complete range of washer specifications available for an individual size requirement in each of the several standard and semistandard washer classifications.

Photo shows the Super-Diamond Pattern of "A.W." Rolled Steel Floor Plate. Provides safe tread from any angle, under any condition.

On busy floors . . . "A.W." Rolled Steel Floor Plate is a practical solution to floor maintenance problems on busy traffic aisles, stair treads, factory floors and refinery towers. With "A.W." Floor Plate, the first cost is always the last cost. Oil-proof, heat-proof, crack-proof . . . permanently safe. No worn and slippery surfaces to endanger men on foot. No cracks or ridges to upset floor trucks. Can be cut to any shape and installed *almost over-night*—that isn't a catch phrase, it's a fact. Write for folder.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N.C., St. Louis Los Angeles, San Francisco, Seattle, Montreal—A. C. Leslie & Co. PRODUCTS INCLUDE—Steel Products in Carbon, Copper or Alloy Analyses : : Sheared Steel Plates : : Hot Rolled Sheets : : Billets, Blooms and Slabs : : "Swede" Pig Iron : : Reading Cut Nails

Machine Tool Electrification Smashes Traditions

By GUY HUBBARD
Machine Tool Editor

■ MACHINE TOOL engineering today is an extremely broad and at the same time a very exacting field of technical activity, as compared to what it was 25 years ago. Then, design was concerned to a large degree with mechanical devices. The profession was to a large extent conducted on a basis of ingenuity plus practical shop experience plus empirical rules involving only relatively simple mathematics.

Today—while ingenuity and practical experience continue to be undiminished in importance — they must be supported by sound theoretical knowledge of mechanisms and materials, plus highly specialized knowledge of electrical and hydraulic principles and apparatus, plus courage to break with any engineering traditions whenever those traditions say: "It can't be done!"

Electrification — in conjunction with hydraulics, to which it is becoming more and more closely allied—is, to my way of thinking, the most powerful tradition-smashing factor which ever has penetrated the machine tool industry. As practiced in this industry, it not only has smashed machine tool engineering traditions, but also it has smashed many deeply entrenched electrical engineering traditions.

There were not a few old-line machine tool designers with little or no understanding of electricity, who shied away from it violently and with almost superstitious dread. Younger designers, however, who did understand its basic principles and who realized its tremendous possibilities, did not get any too much encouragement from some of the old-line authorities in the electrical industry. Those older electrical engineers had in many cases done remarkable things with electrification in "large packages"—heavy locomotives and rolling mill drives for instance—but when it came to envisioning the "smaller packages of power" required for individual machine tool electrification, their imaginations seemed to fail.

Imagination Was Needed

This lack of imagination also extended to the manufacturers of electrical equipment. Just so long as those manufacturers offered to machinery builders nothing more suitable than power plant and building electrification equipment, electrification of machine tools remained relatively in about the same condition as did household electrification during that transition period when it was limited to the wiring of old gas fixtures.

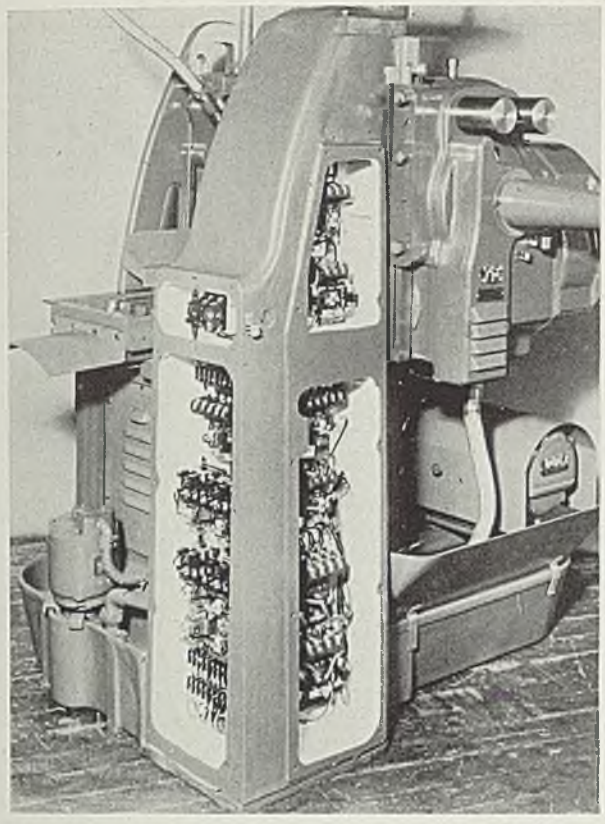
The writer is of the opinion that the first real break toward real electrification of machine tools came about when technical schools began to break down the artificial barriers between their mechanical and their electrical engineering courses. At least 30 years ago, the late Forrest E. Cardullo, at that time professor of mechanical engineering in an eastern college, was confidently predicting to his students just such electrical developments in machine tools as he himself—as chief engineer of the G. A. Gray Co., was destined many years later to be influential in carrying out. When Mr. Cardullo was making his early predictions, hardly one new machine tool in a hundred was being built with individual motor drive, yet he lived to see the day when hardly one new machine tool out of a hundred was not electrified.

Today there is hardly a machine tool plant of any importance in America where electrical engineers do not rate in importance with mechanical engineers in the engineering department, or where at least one capable man does not combine the functions of an electrical and mechanical (and often a hydraulic) expert. There is hardly a plant of such caliber which does not at least once a year have one or more of its engineers spend some time in conference with leaders of the electrical industry—as for instance during the Machine Tool Electrification Forum.

There is no leading manufacturer of industrial motors and control apparatus who has not developed or who is not developing (usually in close collaboration with engineers of the machine tool industry) equipment especially suited for machine tool electrification. The electrical industry has awakened to the fact that here is an industrial market worthy of special and intensive cultivation.

Just to illustrate how far electrification has gone in the machine tool industry—even though the possibilities in many directions have as yet only been scratched—there are presented herewith some photographs of well engineered machine tools, both of the past and of the present. Of these, Fig. 1 shows the Pan American model electrically driven planer as introduced by the G. A. Gray Co. in 1901. For its time this really was a beautiful job, despite the fact that its designers had to work with ordinary switchboard control apparatus, which hardly could be built-in, and had to use one of the cumbersome motors of that era in conjunction with the squeal-

(*Please turn to Page* 89)



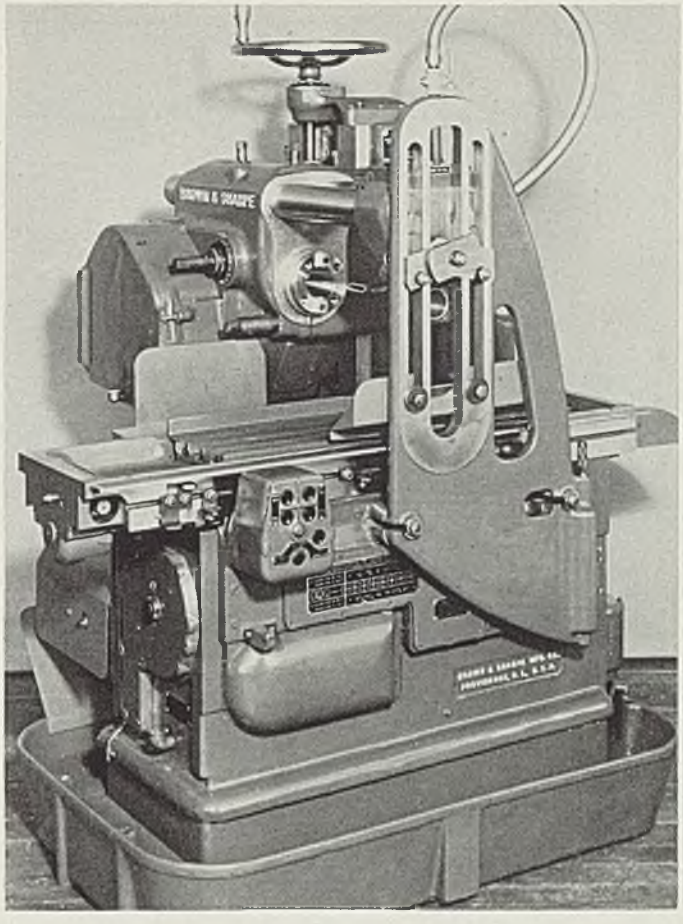
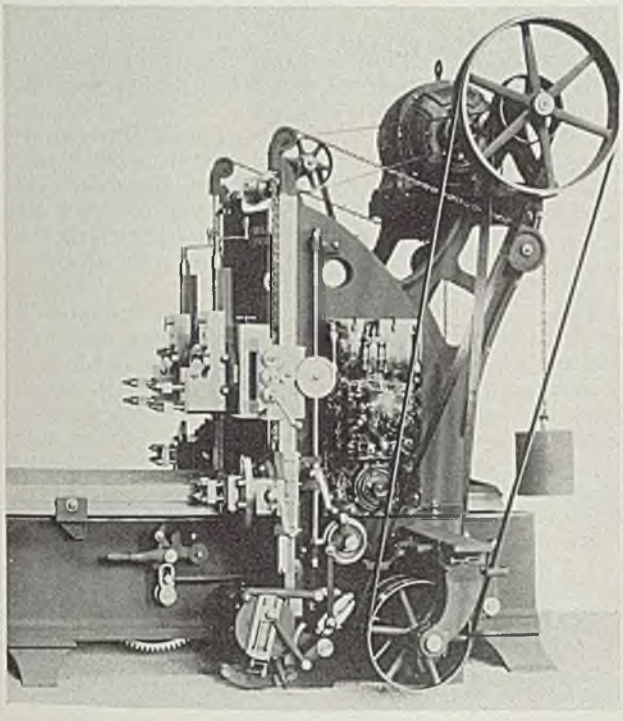


Fig. 3. (Right Above)—Front view of Brown & Sharpe electric milling machine with built-in motors and full electric control

Fig. 4. (Left Above)—Control column of Brown & Sharpe electric milling machine with covers removed to show relays, contactors, etc.



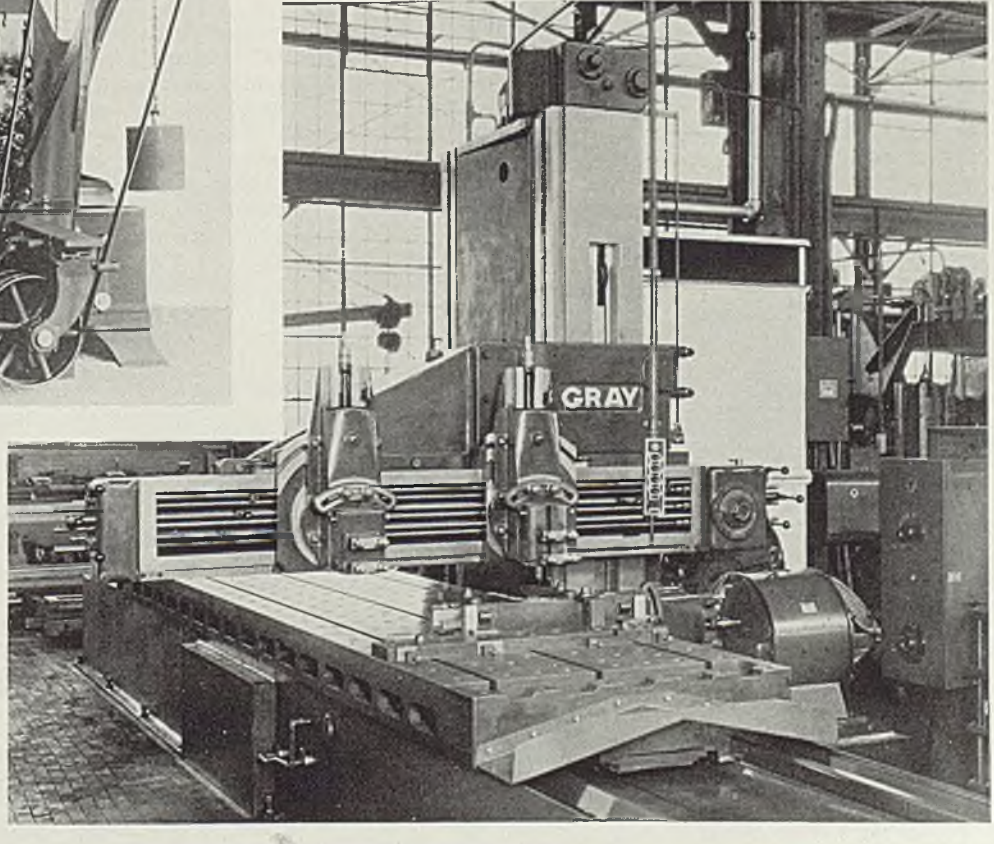


Fig. 1. (Above)—Gray planer with electric drive, as developed in 1901

Fig. 2. (Right)—Recent model Gray openside planer with variable voltage drive

Foundrymen Discuss Methods for Production of Better Castings

■ PROBLEMS of shop practice, production control, heat treatment and physical properties were chief among many considered at two technical sessions and a roundtable luncheon of the malleable division. While the papers were prepared largely from the malleable foundryman's point of view, their implications proved of interest to purchasers and users of castings.

Usual practice in malleable foundries producing castings for the automotive industry is to make large quantities of identical castings on each type of molding machine equipment. Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich., has found it advantageous to deviate from this practice by grouping various assemblies of parts which go on the same car. For example, the carrier housing, differential case and a spring hanger lend themselves to production as a composite assembly in one mold. As many as 14 units are made in a single mold.

How composite molding is engineered and carried out in the Saginaw plant was described by S. W. Healy, assistant to works manager. He pointed out that numerous economies are achieved in scrap control, gating, foundry operations and production control. An added advantage is that of permitting a workman the opportunity of remaining on a given job for a longer period, which from an employe relation standpoint is most desirable. Development in size of equipments has been limited in scope to the size of molds which can be handled manually. A distinct advantage, Mr. Healy said, has been found in material handling through the continuity gained by annealing and processing in closer ratio to the assembly of parts as used by customers.

Malleable Iron

■ An unusual structure in malleable iron, namely, what is termed an inverse chill fracture—the outside shell being black and the core white—was discussed and an explanation advanced by Prof. Enrique Touceda, consulting engineer, Malleable Founders' society, Albany, N. Y. Incidentally, he regarded the terminology "inverse chill" as a misnomer—it has come into use because it is the opposite of the structure obtained when gray iron is cast against a chill.

Some samples of inverse chill malleable were submitted to Professor Touceda for examination. Inspection indicated in all cases that the cores were unsound. Some specimens showed segregations, others did not, thus segregation could not be accepted as an explanation for the condition. No light could be thrown on the matter by comparison with the structure of gray iron.

Therefore, Professor Touceda was forced to conclude that the peculiar structure was a matter of free cementite and pearlite which prevented the core from malleabilizing. The trouble, he felt, was caused by the porous condition. This porosity probably was not caused by gas conditions, but probably by bleeding of the mold. Working on this theory, he has attempted to reproduce the inverse chill structure by casting test bars in a bled mold. Only partial success has been achieved, thus far, consequently proof of the theory is not entirely clear. He seems positive, however, that the structure can not be produced by heat treatment, as one speaker suggested.

■ PRESENTED on this and succeeding pages are reports of various technical sessions held during the forty-fourth annual convention of the American Foundrymen's association in Chicago, May 6-10. Additional reports will appear in STEEL next week.

Effect of manganese on second stage graphitization was the subject of one paper by D. P. Forbes, P. A. Paulson and G. K. Minert, Gunite Foundries Corp., Rockford, Ill. Purpose of this investigation was to show that manganese serves as a graphitization retardant and carbide stabilizer. Samples of malleable containing 0.45, 0.91 and 1.28 per cent manganese, respectively, were studied and all were annealed at 1300 degrees Fahr. Results indicated that more than 1 per cent of this element definitely retards graphitization. This influence is beneficial, Mr. Minert explained, because it prevents minor variations in commercial malleablizing conditions from exerting an influence on physical properties obtained.

Discussion of the paper reflected rather general agreement with the authors' contention although few malleable foundries produce iron containing over the usual commercial contents of manganese. R. J. Cowan, metallurgical engineer, Surface Combustion Corp., Toledo, O., however, raised a question as to why a temperature of 1300 degrees Fahr. was used as the annealing temperature of all three analyses. He pointed out that since manganese changes the critical point of the iron, it might have been well to determine the critical point of each analysis and to anneal each at this temperature. Then, he said, the results obtained for the three irons might have been more nearly comparable. Mr. Minert explained that the 1300 degree temperature had been used in the investigation because this is the temperature employed in commercial spheroidization.

Austempering Discussed

Carl F. Joseph, metallurgist, Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich., stated that in his experience high manganese is not used in malleable because this element adversely affects machinability and machinability is an important factor in automotive malleable iron.

Results obtained by subjecting pearlitic malleable iron used for commercial camshafts to an austempering treatment were shown micrographically in a paper contributed by Mr. Cowan. He pointed out that by carefully regulating the temperature of the quenching bath and the time of immersion, it is possible to control the hardness desired. Pearlitic malleables thus treated were shown to possess superior wear-resisting characteristics. A hardened structure may be confined to the surface areas of a heavy section while the remainder of the piece will receive a heat treatment that will have a toughening effect.

Considerable difference of opinion was expressed in discussion of Mr. Cowan's paper as to the desirability of using the austempering treatment for malleable iron. Chief difficulty seemed to be the size and cost of the equipment required, because of the necessity of using the lead or salt bath quench, and because of the longer time involved in the treatment. Mr. Cowan pointed out that this was a continuous process and eliminates the heating of cold material for the customary draw. Discussion veered off onto the subject of wear which is a controversial topic. It was made clear that it is not possible to coordinate wear properties of malleable and steel simply on the basis of hardness. Examples were related where because of the nature of malleable, hardness of this material can be reduced considerably from that which steel must possess for

. . . . . a GAS-TIGHT

SOAKING PIT COVER

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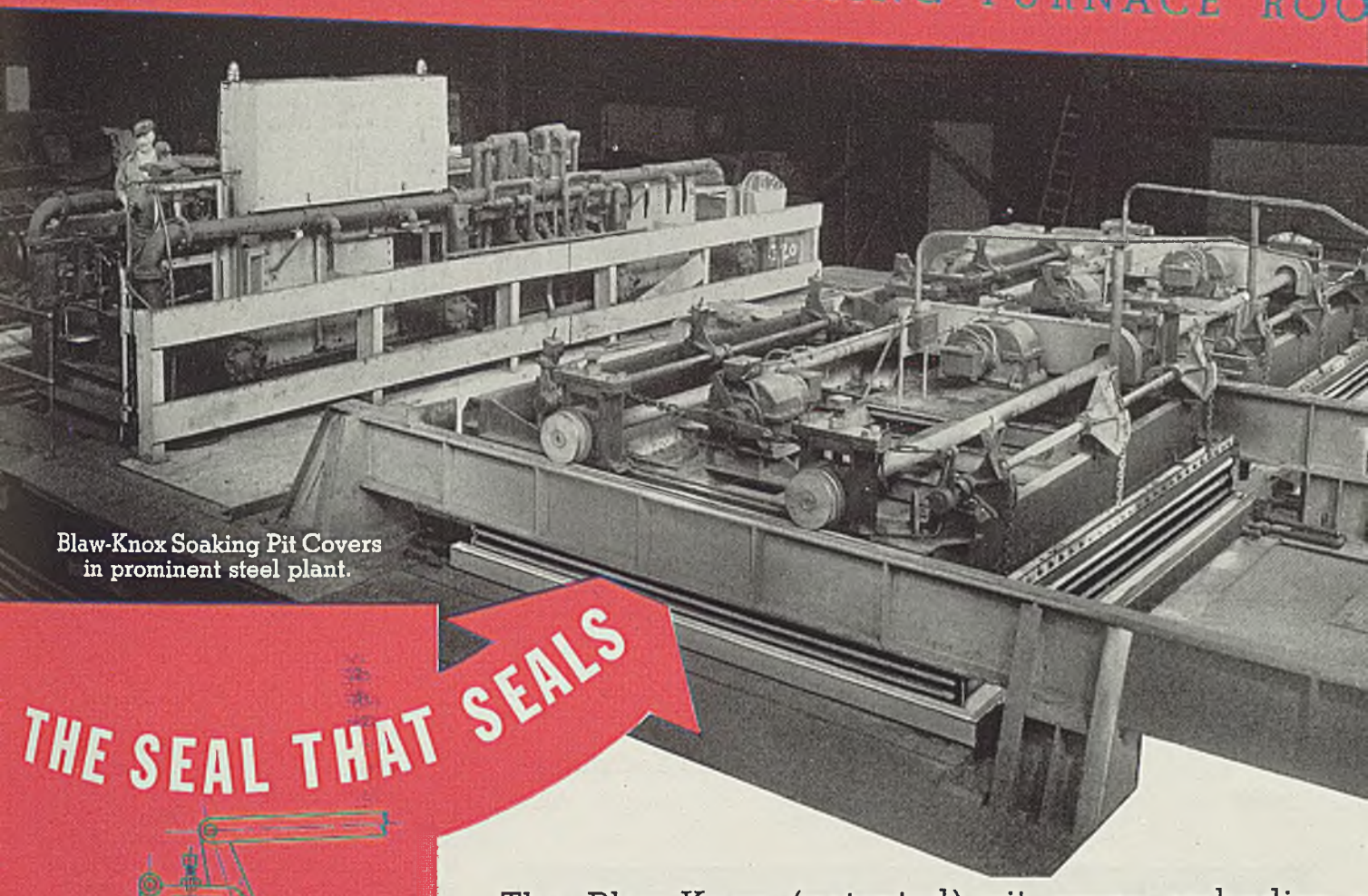
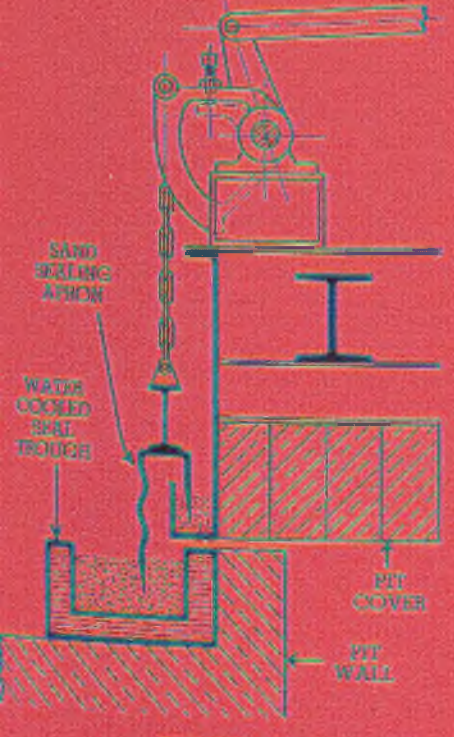


Blaw-Knox Soaking Pit Covers in prominent steel plant.

THE SEAL THAT SEALS



The Blaw-Knox (patented) pit cover embodies a entirely new idea.

The sealing is done, not by a ponderous vertica movement of the entire cover weighing 15 or mor tons, but by the smooth vertical action of a separat sand sealing apron, weighing less than 1,000 pound

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the same degree of wear resistance.

Crystallization

Although the theory of crystallization, that is, the transition of materials from the melted to the solid state, is well known, probably only a comparatively few have a vivid and concrete picture of what actually takes place. Consequently, a demonstration by microprojection of the growth of crystals proved a popular feature of the convention. This demonstration, conceived and developed by Dr. C. W. Mason, professor of chemical microscopy and metallography, Cornell university, Ithaca, N. Y., was made on several occasions.

Projecting on the screen what transpired under a microscope when certain nonmetallic materials changed from the liquid to the solid state, Dr. Mason enabled the audience to observe crystal formation. Since the behavior of metals is known to be the same in general principle as that of nonmetals, it was not difficult for the observer to believe that he actually was witnessing the freezing of molten metals. The experiments were simple and served well to illustrate crystallization phenomena.

Illustrated in the demonstration was the formation of dendrites, segregation of impurities and other phenomena. Allotropic transformations, eutectics and numerous other cases of phase studies also were simulated. Dr. Mason similarly showed how plastic deformation or cold work causes grain growth.

Many who have witnessed the demonstration pronounce it a most interesting and enlightening educational feature for those seeking information on metals.

Nonferrous

Brief resume of the "Tentative Recommended Practices for Sand Cast Foundry Bronzes, Red and Semi-red Brasses," sponsored by the nonferrous division of the A.F.A., was presented by G. K. Eggleston, metallurgist, Detroit Lubricator Co., Detroit. In discussion of these, Sam Tour, vice president, Lucius Pitkin Inc., New York, questioned a number of points relative to the limiting amounts of such elements as silicon, sulphur, aluminum and antimony, stating that he believed them to be too high. He asserted that he believed specifications given should conform to those of the American Society for Testing Materials.

New officers for the nonferrous division were elected as follows: Chairman, W. J. Laird, metallurgist, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; vice chairman, W. H. Romanoff, technical superintendent, H. Kramer & Co., Chicago; and members of the advisory board, H. B. Gardner, chemical metallurgist, national bureau of standards, Washington; E. F. Hess, Ohio Injector Co., Mansfield, O.; and J. W. Kelin, assistant sales manager, Federated Metals division, American Smelting & Refining Co., St. Louis.

Apprentice Training

Reviewing the historical details of apprentice training from the time of the craft guilds in the fourteenth century and tracing the changes through the years, A. L. Armantrout South Works, Carnegie-Illinois Steel Corp., Chicago, examined the elements of an adaptable apprentice program in the light of today's needs.

Careful consideration of a training program, close adherence to the original plan, formation of a supervisory apprentice committee working in co-operation with the management and with foremen, development of an accurate and complete system of records of apprentices' progress and careful selection of instructors for apprentices are some of the essentials of any intelligent program.

Mr. Armantrout observed that apprentice instruction outside the shop can make or break the complete training program and he advised close attention to provision of textbooks and instruction sheets. In routing apprentices through various phases of the shop, he said the best plan was to follow raw material through the plant from the receiving dock to the finished product.

Federal Aid Possible

He pointed out that small plants not able to afford a complete apprentice training program can combine with other plants in this work, and can obtain federal funds under the Smith-Hughes act for carrying out the training.

Wage rates for apprentices should be proportional to their ability to do productive work. At the South Works, they are started at 55 per cent of the going journeymen's wage and are advanced by 5-point steps until 90 per cent of the journeymen's rate is reached. Then apprentices are given an examination which, if passed, entitles them to the full rate.

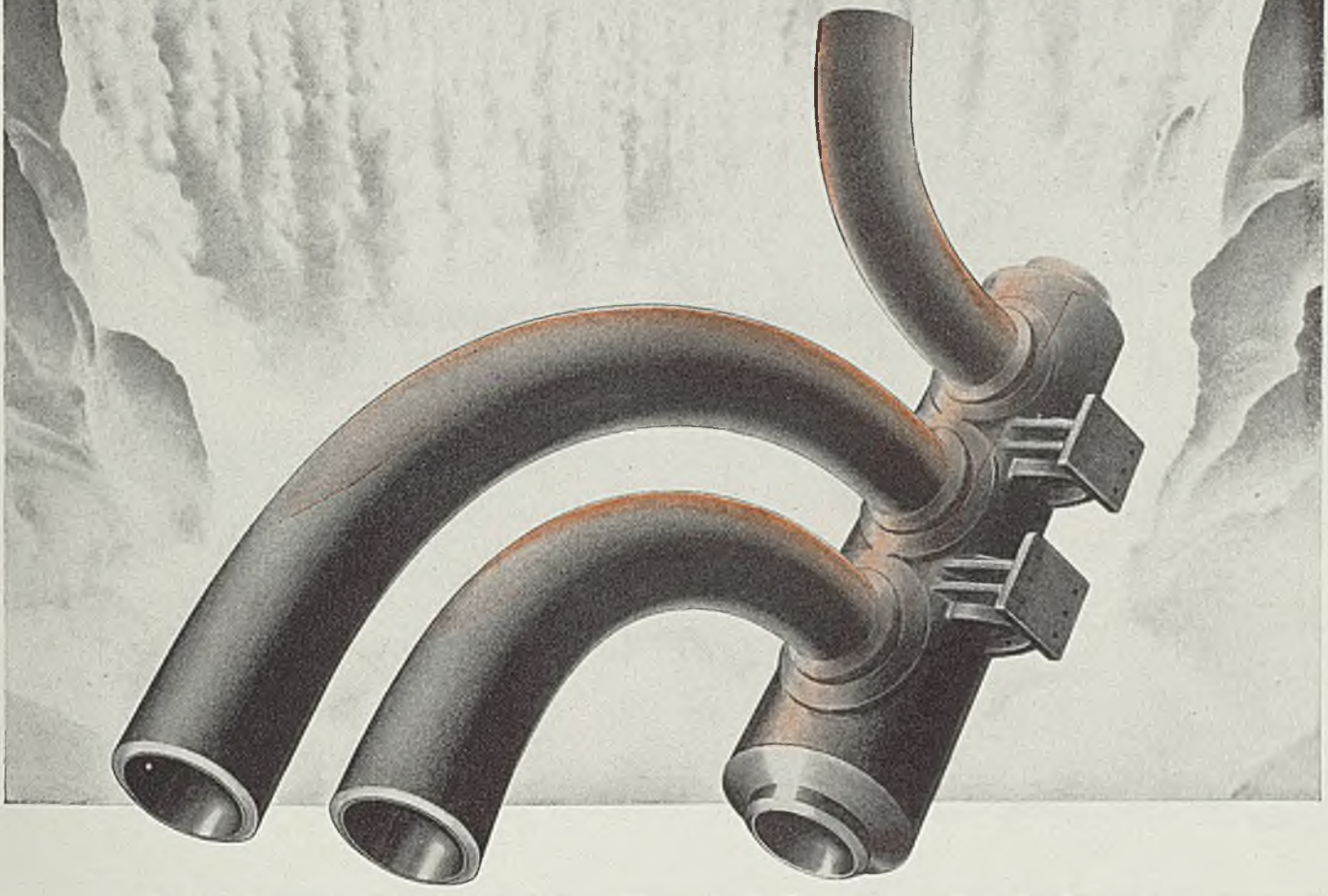
Careful selection of apprentices is vital. First choice usually is confined to sons of employes, providing they can pass routine physical and mental ability tests. Mechanacil aptitude ranks equally high with mental ability in rating apprentices.

"Training of foundry apprentices is the kind of education that will perpetuate the foundry industry on a high competitive level, the kind of education that will pay big dividends to the foundries which sponsor it, and the kind of education that will give our economic society many happy, useful and purposeful citizens," said A. H. Wornom, instructor of foundry training, Newport News Shipbuilding & Drydock Co., Newport News, Va., in a resume of the technique of training foundry apprentices. His company has had a training system

(*Please turn to Page* 90)

Foundrymen of the United States and Canada spent six busy days last week inspecting the more than 200 displays of equipment and supplies at the Foundry and Allied Industries show in International Amphitheatre, Chicago, during the forty-fourth annual convention of the American Foundrymen's association. The view here is in the arena where considerable of the heavy machinery was located. Last previous show was in Cleveland in 1938

33 TIMES
NIAGARA'S PRESSURE!



TAMED *by Grinnell prefabricated piping!*

Recent specifications of a large steam power plant called for a complex piping system to carry pressure equivalent to a 5542-foot head of water . . . pressure 33 times that of Niagara Falls!

This super-pressure piping presented new problems in prefabrication. To insure interpretive engineering of these problems with expert laboratory collaboration, engineers "gave the plans to Grinnell." They chose the most efficient way to obtain "on time" deliveries of accurate, tested subassemblies requiring minimum field-fabrication.

Unusual prefabrication is but one of the many services that make Grinnell the leading name "whenever piping is involved." Others include: automatic sprinkler fire protection systems, Thermolier unit heaters, Amco industrial humidifiers, pipe fittings and pipe hangers. For detailed information on these services, write to Grinnell Co., Inc., Executive Offices, Providence, Rhode Island.

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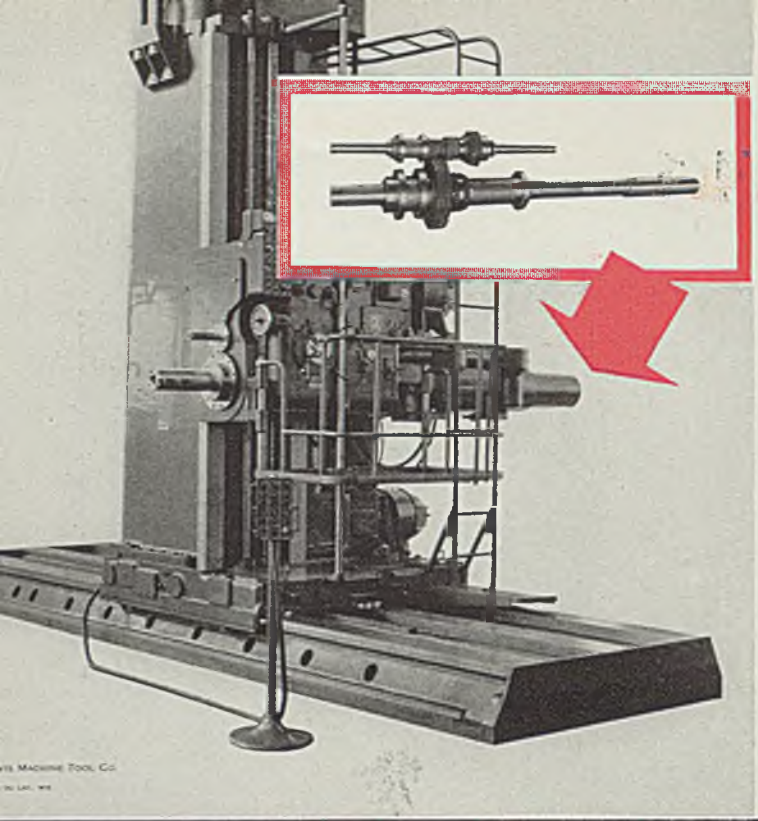

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FOR 10 YEARS this manufacturer of soundly-designed, dependably-performing machine tools has used Nitrided Nitralloy spindles *exclusively* in all its machines. Its exceptional wearing qualities and resistance to scratches and burrs not only guarantee precision performance for the user, but simplify design and manufacture as well. And even after years of heavy usage these Nitrided Nitralloy spindles are still performing with complete satisfaction, more firmly implanting thereby the user's good-will toward the machine's manufacturer. For other examples of Nitrided Nitralloy's outstanding service is wear-resistant parts throughout all industry, write The Nitralloy Corporation or any of its licensees, listed below.

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Republic Steel Corp.	Cleveland, O.
The Timken Roller Bearing Co.	Canton, O.
Vanadium-Alloys Steel Co.	Pittsburgh, Pa.

A FEW TYPICAL APPLICATIONS

Calender Rolls
Cams and Camshafts
Chain Links and Pins
Connecting Rods
Crankshafts
Cylinder Liners
Die Casting Dies and Cores
Fan Blades
Fuel Injector Parts
Gears
King Pins
Pinions
Piston Rods and Rings
Pump Rotors and Sleeves
Push Rods
Scale Balances
Scale Blocks
Seaming Rolls
Seats for Valves
Shackle Bolts
Shafts
Sockets
Spindles
Splines
Sprockets
Steering Worms
Tappets
Valve Gauges
Valve Seat Rings
Valve Stems and Sleeves
Water Pump Shafts
Worms
Wrenches

BETWEEN HEATS WITH Shorty

■ Say fellers:

Wanta hear a good story chuck full of facts—somethin' like the Alger yarns we used to read 'bout when we were kids? Remember? All right, close the door 'cause you can't hear when "Boney" Dugan is changin' stoves.

Remember the little Princess stack on the James river few miles south of Clifton Forge down in Virgini'? Only made 90 tons of iron a day. And say, fellers, you could jump off the top of 'er and never scratch your shins. She was owned by a well-known iron interest down in Cinci, O. The boys got in financial difficulties during the depression followin' 1914 so they put this little furnace 'long with other properties up as security with a banker in Cinci.

Attention, Please

And say, fellers, let me plug a little word of 'dvice in your ears—some confidential stuff like you hear 'bout when the sheet mill boys start rockin' the boat. I know you didn't ask for it, but as Tony Costello over at the pig machine would say: "Lenda me for one of your ears like Billy Shake-a-Spear he all the time asks for you to do and you wasa do it."

This is what I want to say: If you've ever run a merchant blast furnace, you can bet your neck that durin' periods of activity the feller who makes the best showin' in pig iron is the feller who knows least 'bout the business of makin' iron. You 'gree with me, huh? Glad to know it. You're strokin' par, son.

Well anyway, since the president of this bank, a shrewd flipper and flopper of Uncle Sam's greenbacks, didn't know what a monkey bed or a skimmer was 'round a blast furnace, 'twas a foregone conclusion he could make a lotta jack operatin' the property. And say, fellers, that's 'xactly what he did.

'Long 'bout August, 1915 he puts the blast on the little pot and starts pilin' iron. He calls in some brokers and he says: "Hey, you dispensers of cast iron, see that pile of pigs out in the yard? Well, boys, you can start sellin', but keep the price $2 higher than the market." And the boys thought the banker was cuckoo, probably 'cause he did most of his work back of a cage, I guess. Maybe he was, but they didn't lock 'im up.

The winter of 1916 rolled 'round. Pig iron jumped to $18.50 and then slumped off to 'round $17.50. And you know, fellers, while everyone else was sellin' ahead as far as they could get customers to make a contract, this little furnace bumped its authorized price to $25 and kept on pilin' iron. Jus' 'magine that. Sure looked like they shoulda dusted off the padded cell ready for 'nother one to move in, huh?

And then to complicate matters worse—when the robins started comin' back in 1917 and the price of iron was $25, the Princess price was $30, though the company did condescend to take some mail order business at this figur'. Sounds cockeyed, doesn't it? But 'tain't, fellers, so keep readin' and watch 'em go to town.

Later, when consumers were scramblin' for tonnage, and the price was pegged close to $50, the boys workin' little Princess stack were sittin' pretty back of the counter with graphite all over their workin' clothes, 50,000 tons of iron in the palm of their hand and sayin' without battin' an eye, "Come and get 'er, fellers, at 50 bucks per."

Path Too Narrow

Y' think the fellers took the hint. Y' suppose the little path wendin' its way down to the furnace and out to the storage yard was wide 'nough? T'was not. Couple of 'xcavators changed 'er into a super-highway, so to speak, and the boys started goose-steppin' with their cloghoppers 'til there was no use operatin' the red light up at the corner. Looked jus' like as though Heinie Hitler told his go-get-tum gang to see if there was 'nough pigs to make a few watch fobs so they wouldn't miss the boat.

Y' ever hear the story 'bout the mousetrap out in the woods? Well, sir, y' ain't heard nothin'. Colored boys at the furnace put on their hand-leathers and all you could hear was the metallic clang of the pigs droppin' in the cars. The iron carrier's wives spent many a weekend with a darner in one hand and darnin' cotton in the other, fixin' holes in the back of their ol' man's socks. Many a carload of pig iron passed over the scales, and I never counted the bill-of-ladin' pads they used down in the scale house. They sure had trouble keepin' points on their lead pencils, though.

Well, boys, pigs is pigs and the cash registers started ringin' like those in the 5 and 10's. And by the end of 1917 this little furnace which had only been able to turn over a reasonable profit when operatin' under real hope-to-die furnacemen, had paid off all debts and obligations of its 'riginal owners and had released both itself and the other properties 'trusted to the bank for securities. Y' wanta know how much they put away in the till? Somethin' like $1,250,000. Not a bad day's work, huh?

So that's the story, fellers, and I'm feelin' sorry I can't chin with you a little longer but there's an ore car off the track on the highline so gotta go. But before I shove off, I wanta say somethin' to you fellers breathin' slag fumes and flue dust all day—you fellers watchin' funny little skip cars go up and down and you who keep listenin' for the sound of the check whistle—I wanta ask you this, "Y' know where we can find a couple of guys like that banker in Cinci?"

If you do, give me a ring 'cause I'd sure like to play a tune on the boss' cash register. Course the sheet mill boys broke the bell on the cash box few weeks ago when they took in some I.O.U.'s, but we fixed 'er again and she's jus' waitin' to go to the dell with some more ding dongs.

So if you ever get your peepers on an iron merchandizer like the go-getter I jus' tol' you 'bout, let me know and reverse the charges. Well, I'll be seein' you.

"Shorty" Long

Transparent Document Protectors Announced

■ A new, transparent, waterproof page protector of Pliofilm, a rubber hydrochloride, is announced by Protex Products Co., Newark, N. J. It is designed to preserve important papers, documents, photographs, etc., which are subjected to frequent handling.

Protectors slip over pages easily and are punched on the open ends so they will fit binder rings, or posts. They are flexible, odorless and noninflammable.

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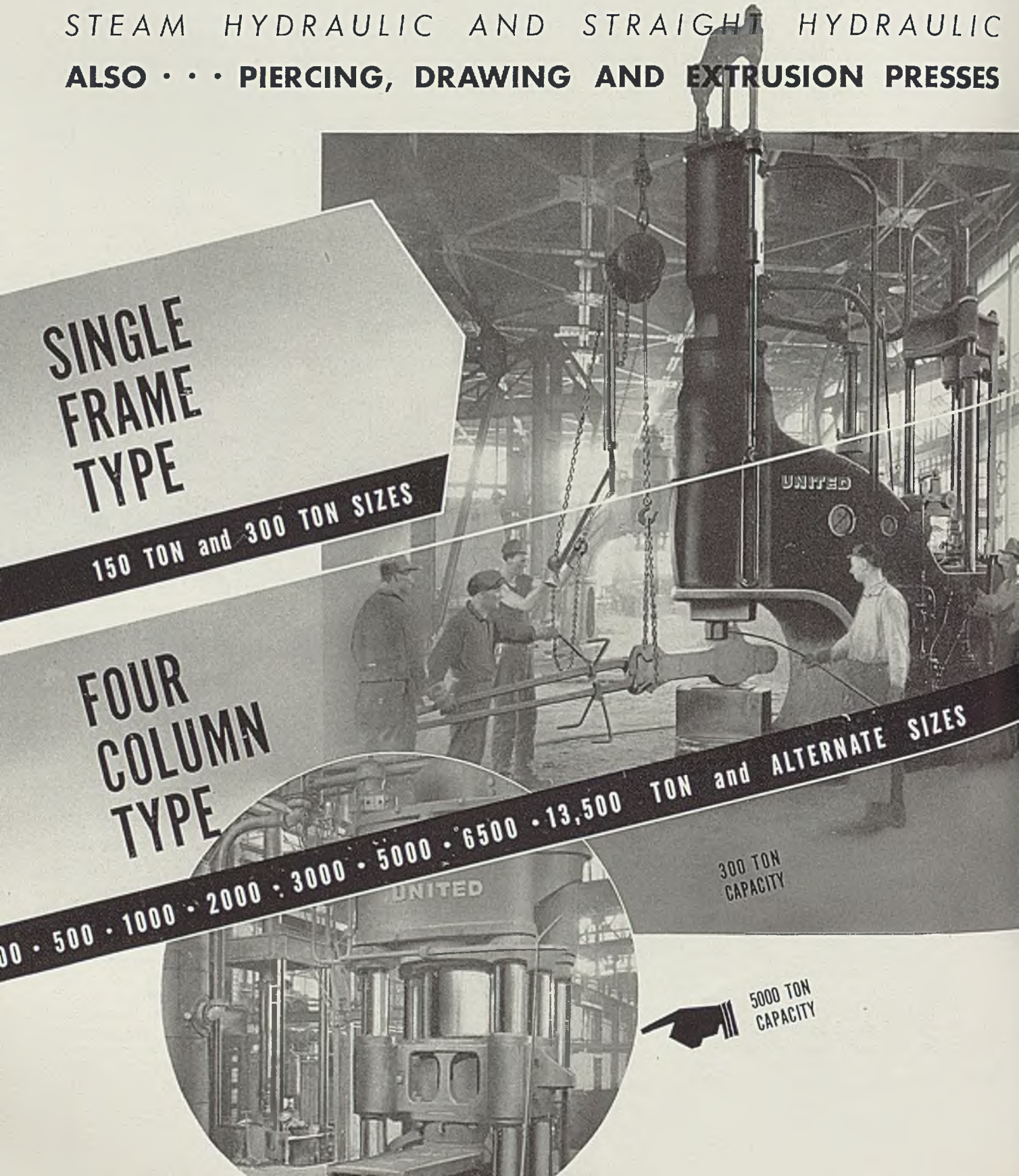
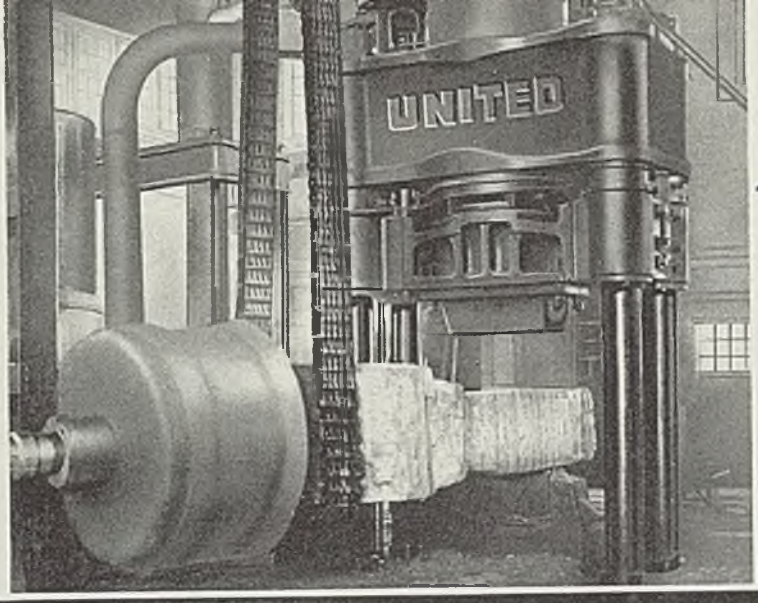
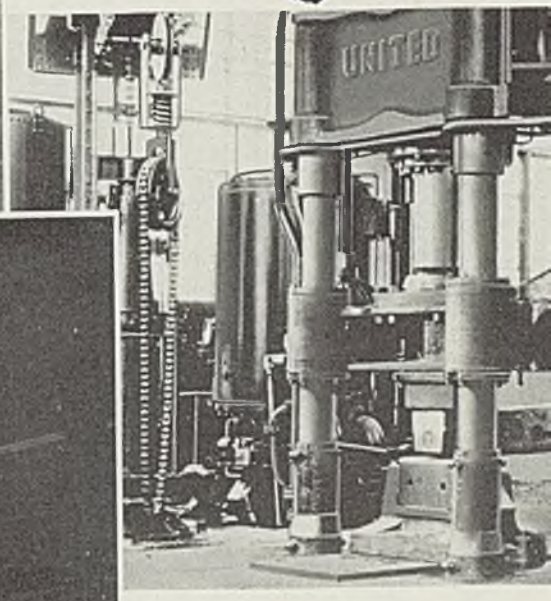
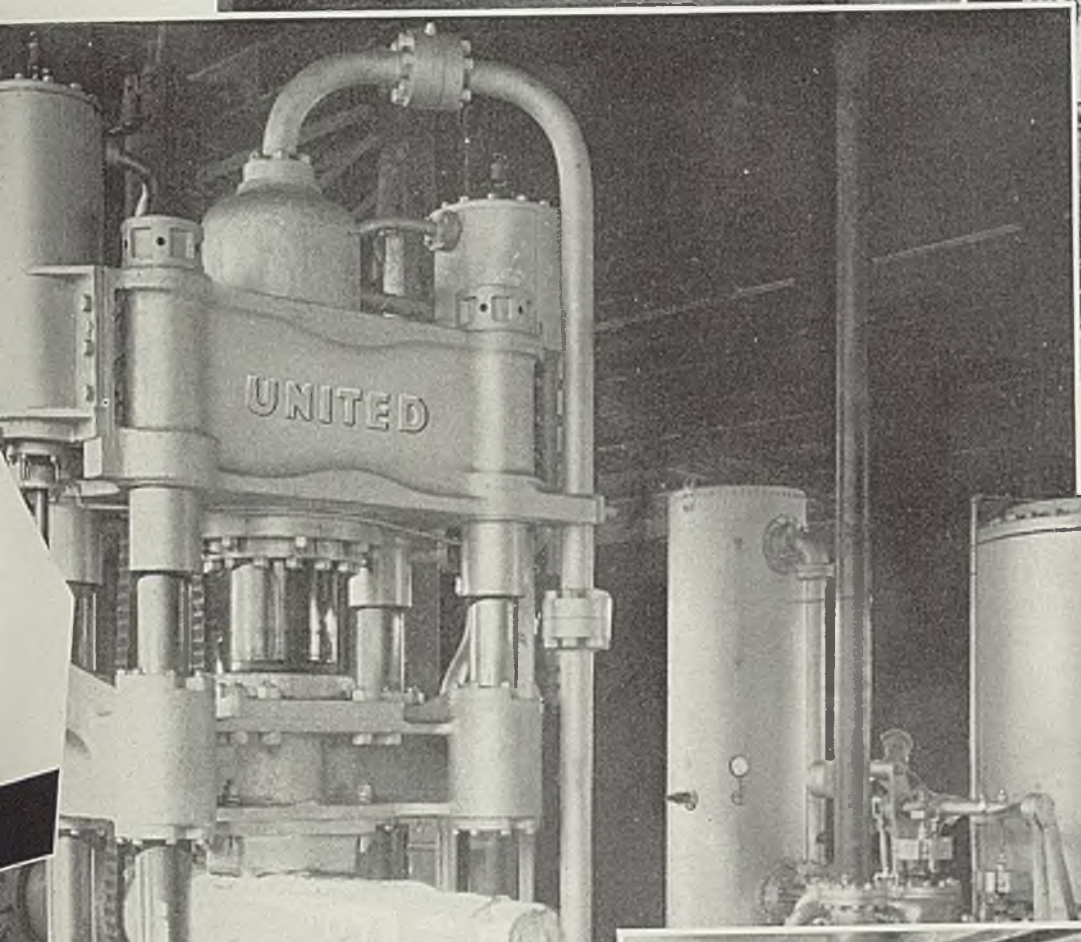




1200 TON CAPACITY

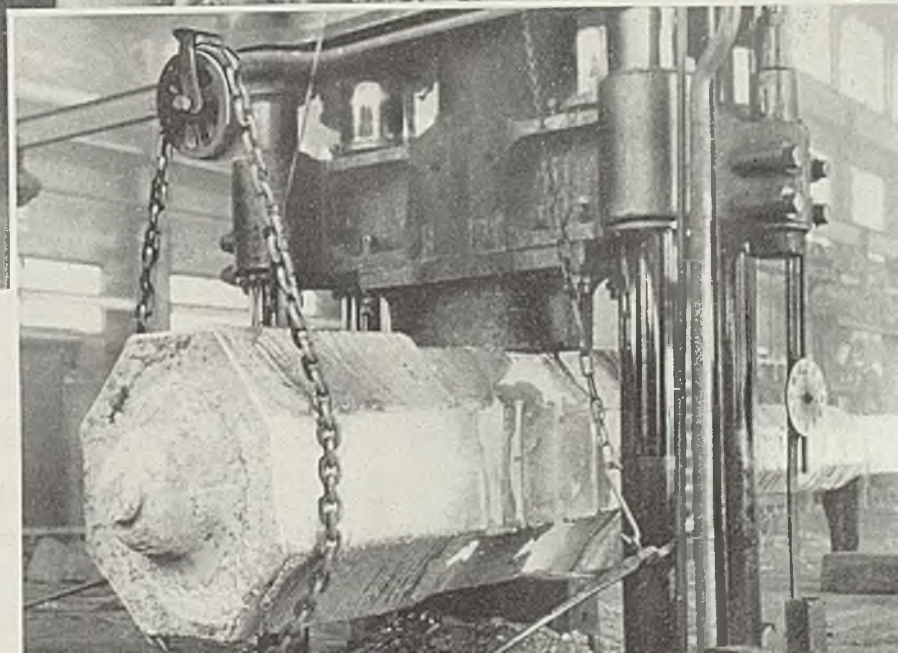
1000 TON CAPACITY





2000 TON CAPACITY

750 TON CAPACITY



UNITED

ENGINEERING *and* FOUNDRY COMPANY

PITTSBURGH — PENNSYLVANIA

Residual Tin in Steel

Investigation discloses higher tin-contaminated steels can be used for deep drawing, permitting lower cost scrap to be charged. Effect of other alloys on drawing varies

By PAUL McKIMM
Cleveland

PART II

■ FOLLOWING the test as described in Part I, several test heats were made in an endeavor to obtain high tin in the bath and thus avoid adding virgin tin to the mold. The open-hearth charge was purposely made to include irons containing tin and an increased quantity of bundled tin scrap. Several high tin heats were obtained having a ladle analysis of carbon 0.07, 0.08 and 0.09 per cent, manganese 0.29 to 0.34, and tin 0.18, 0.21, and 0.12. A check analysis on the 0.12 per cent tin heat was made from three crop tests, one at the top, middle and bottom of the ingot, each being tested at the middle and edge. Test results were as follows:

Element	Ladle	Top middle	Top edge	Middle middle
	Per Cent			
Carbon	0.08	0.05	0.03	0.04
Manganese	0.32	0.31	0.30	0.30
Phosphorus	0.007	0.009	0.006	0.008
Sulphur	0.032	0.041	0.022	0.038
Copper	0.40	0.44	0.40	0.44
Tin	0.12	0.20	0.10	0.20
Chromium	0.048	....	....	....
Nickel	0.11	....	....	....

Fig. 4—Surface of split ingot before being drilled

A heat of the following analysis was processed in all respects including annealing and the 0.005-inch skin pass according to ordinary routine procedure:

Element	Middle edge	Bottom middle	Middle edge
	Per cent		
Carbon	0.03	0.04	0.03
Manganese	0.29	0.30	0.28
Phosphorus	0.007	0.008	0.007
Sulphur	0.024	0.031	0.024
Copper	0.40	0.40	0.40
Tin	0.12	0.14	0.12

The physical test conformed to normal standards and after skin passing, further tests were taken 72, 168 and 336 hours later. The physical change conformed to that existant at that plant, namely, an increase of 3 points in Rockwell, B scale. This material was then applied to several severe drawing parts and the performance was all that could be desired.

In order to determine the effects of the tin content on the physical properties of hot-rolled material, one of the high tin heats was processed into hot strip for a deep-drawing hot strip specification of 0.08 to 0.12 per cent carbon. This heat analyzed:

Element	Per cent
Carbon	0.10
Manganese	0.30
Phosphorus	0.007
Sulphur	0.031
Tin	0.21

After rolling into slabs a crop test was taken at the end of each slab of two ingots. The analysis for tin follows:

Top of ingot	% Tin	Top of ingot	% Tin
1	0.18	6	0.19
2	0.22	7	0.24
3	0.24	8	0.24
4	0.26	9	0.25
5	0.29	10	0.27

These slabs were rolled to 0.126-gage x 7¼ and 7⅝ inch multiples where the width was 4 multiples or 29½ inches wide allowing for edge slitting. The strip delivering from the mill at 1560 degrees Fahr. was cooled on the hot bed, uncoiled.

The following table shows the physical values of high tin (0.21 per cent) and regular material:

	0.21% Tin	Regular
Elastic limit, p.s.i.	39,230-41,350	40,000
Ultimate, p.s.i.	52,800-54,620	52,000
Elongation, % in 4"	38-42	40
Rockwell, B scale	53	57

It is obvious that the high tin physical values compare favorably with average results on the same gage material of normal tin content, and having identical treatment.

Ordinarily in average open-hearth steel production the tin content will be relatively low, say 0.020 to 0.025 per cent, or perhaps as high as 0.035

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THESE TOWERS HAVE REMAINED IN PERFECT CONDITION

● An inspector advises that these transmission towers built in 1916 are in as good condition today as they were when they were erected 24 years ago, indicating many years of perfect service to come. The owner of them, The Connecticut Power Company, writes: "Our experience over a long period of years indicates the wisdom of insisting on Hot Dip Galvanizing for outdoor steel construction" . . . *Yes it's true* where rust is a factor, nothing serves so long for so little as Hot Dip Galvanizing. Hot Dip Galvanizing guarantees an adequately thick coating of zinc and a union between zinc coating and base metal that makes each an *inseparable* part of the other . . . Buy from members of this association and be sure that you are getting a genuine Hot Dip job, handled in accordance with our high and rigid standards and delivered at a reasonable cost. Write for Specification Sheet. American Hot Dip Galvanizers Association Incorporated, American Bank Building, Pittsburgh, Pennsylvania.

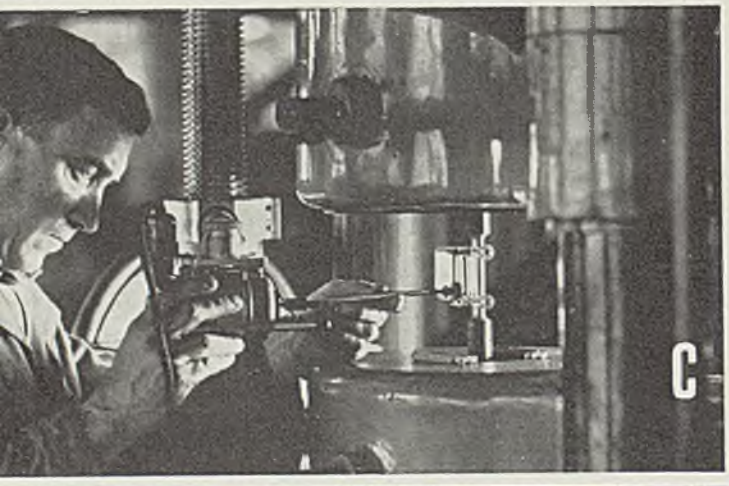
IF IT CARRIES THIS SEAL IT'S A JOB WELL DONE

●

FROM OUR FILES — CASE NO. 0652. Transmission towers of The Connecticut Power Co., between Cromwell and Bristol, galvanized by Wilcox, Crittenden & Co., in 1916.

Acme Galvanizing, Inc., Milwaukee, Wis. ★ Acme Steel & Malleable Iron Works, Buffalo, N. Y. ★ American Tinning & Galvanizing Co., Erie, Pa. ★ Buffalo Galvanizing & Tinning Wks., Inc., Buffalo, N. Y. ★ Diamond Expansion Bolt Co., Inc., Garwood, N. J. ★ The Fanner Mfg. Company, Cleveland, Ohio. ★ John Finn Metal Works, San Francisco, Cal. ★ Thomas Gregory Galvanizing Works, Maspeth, N. Y. ★ Hanlon-Gregory Galvanizing Co., Pittsburgh, Pa. ★ Hubbard & Co., Oakland, Cal. ★ Independent Galvanizing Co., Newark, N. J. ★ International Derrick & Equipment Co., Columbus, O. ★ Joslyn Co. of California, Los Angeles, Cal. ★ Joslyn Mfg. & Supply Co., Chicago, Ill. ★ L. O. Koven & Brother, Inc., Jersey City, N. J. ★ Lehigh Structural Steel Co., Allentown, Pa. ★ Lewis Bolt & Nut Company, Minneapolis, Minn. ★ Missouri Rolling Mill Corp., St. Louis, Mo. ★ The National Telephone Supply Co., Cleveland, Ohio. ★ Riverside Foundry & Galvanizing Co., Kalamazoo, Mich. ★ San Francisco Galvanizing Works, San Francisco, Cal. ★ The Sanitary Tinning Co., Cleveland, O. ★ Standard Galvanizing Co., Chicago, Ill. ★ Wilcox, Crittenden & Co., Inc., Middletown, Conn. ★ The Witt Cornice Co., Cincinnati, O.

TO MAKE SURE



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(A) *Testing toughness of steel by breaking it in an impact machine.*
(B) *Testing the behaviour of steel under repeated alternating stress in fatigue machine.*
(C) *Taking exact measurements of strength and elastic properties with an extensometer.*
(D) *"Guillotine" test for determining resistance to drop impact.*

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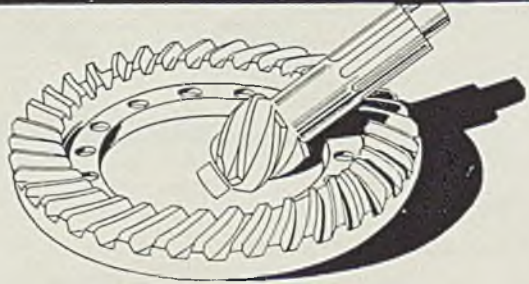
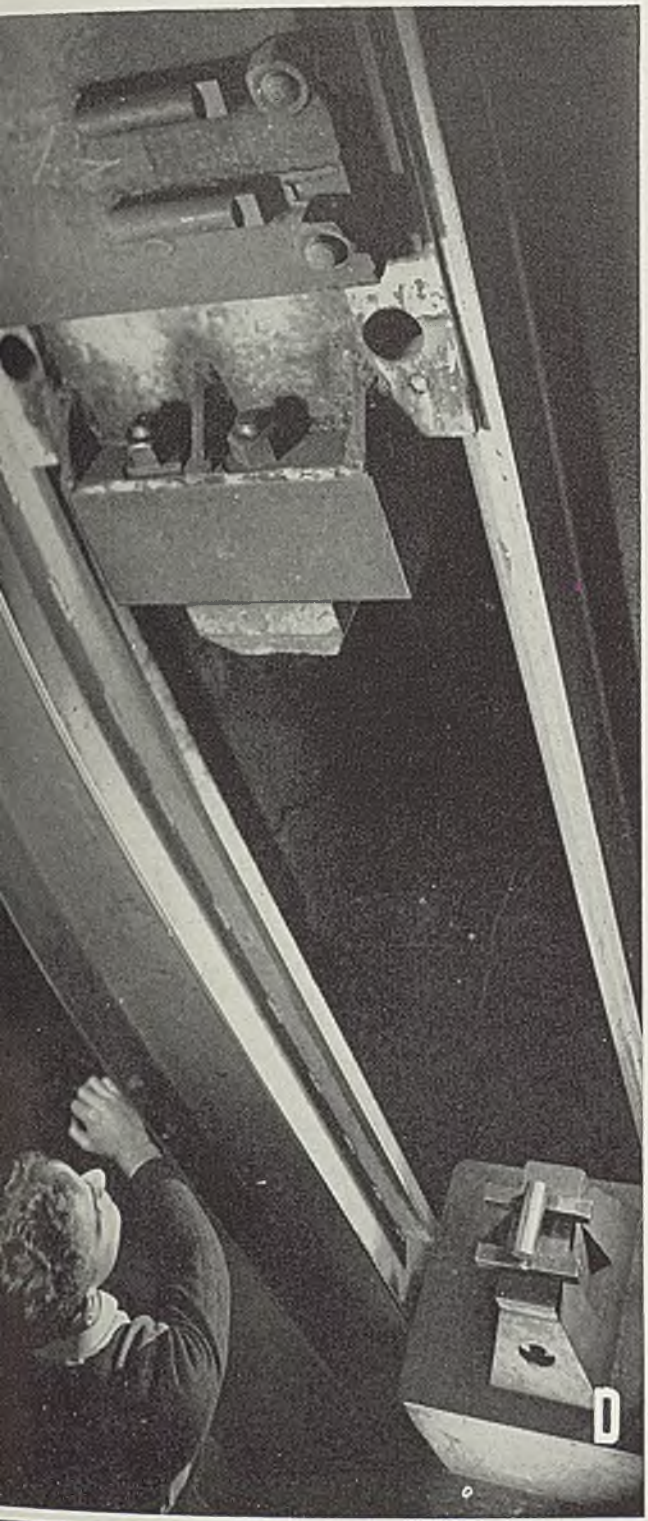
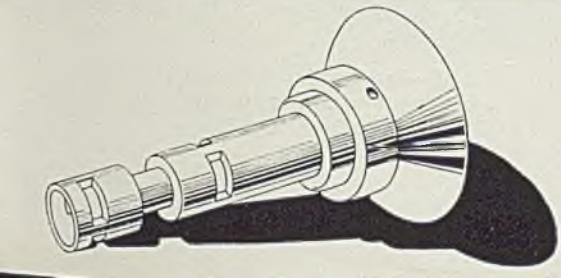


YOU GET EXACTLY WHAT YOU ASK FO



ALLOY STEELS



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In U·S·S Carilloy Steel production, temperatures are rigidly controlled through each process. Special roll pass formations help to eliminate possible mechanical defects. Constant chemical and metallurgical checks are maintained. In melting, rolling, finishing, heat-treating, testing — in every step from furnace to final inspection, Carnegie-Illinois Alloy Steel production is on a *controlled quality basis*.

U·S·S Carilloy Alloy Steels produced under these rigid methods assure you consistently economical fabrication and insure the dependable performance of *your* product. Our metallurgical advice in their proper selection and application is yours for the asking.

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Pittsburgh and Chicago

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USS

UNITED STATES STEEL

per cent or a little higher therefore, the average steelworks will seldom encounter high tin heats unless they charge partially detinned scrap in large quantities. It is always possible, however, to encounter high tin contamination although improbable.

In order to further elucidate the effects of tin on the physical characteristics of cold-reduced strip-sheets for extra deep drawing, it appeared feasible to charge a heat as previously described with tin-contained bundled scrap, anticipating a tin content higher than ordinarily attained.

This heat had a ladle analysis as follows:

Element	Per cent
Carbon	0.08
Manganese	0.30
Phosphorus	0.008
Sulphur	0.029
Copper	0.16
Tin	0.07
Nickle	0.06
Chromium	0.046

This heat was produced according to standard open-hearth practice and teemed into 24 x 38½-inch molds. The steel was of the effervescent type, deoxidation being accomplished by an aluminum addition to the ladle of 0.04-pound per ton or 6 pounds for the heat. Aluminum pellets were added during teeming in order to control the rimming characteristics. This additional aluminum amounted to 0.008-pound per ton or 12 pounds for the heat, making a total addition in both ladle and mold of 0.12-pound per ton or 18 pounds per heat.

Tested for Segregation

An ingot from this heat was slit so that a segregation test could be made. The method of slitting was to radiograph the ingot in the 38½-inch direction about 2 inches off the center line. The face was machined 1¼ inches leaving the section ¾-inch over half so that drillings would conform to the absolute center of the ingot. Fig. 4 shows the split ingot before drilling.

This extremely solid ingot is free of any honey-combed blowholes or those pencil-like cavity cross sections. The ingot was nearly free of the usual blowholes, the few that did exist being about 4 inches in from the wall. The dark spot area to the left side about 2 inches up from the butt was due to the radiograph torch cutting in. Although this is an exceptionally solid ingot it would have been somewhat better if a little less aluminum had been added to the mold. Of course, these ingot features have no bearing on the tin effect on ultimate results.

The ingot was drilled so as to obtain samples for analysis along a line 2 inches from the edge, 2½ inches from the bottom line and then 6 inches center to center of the drill holes in the vertical direction and 5¾ inches in the horizontal direction. The location and analysis for carbon, manganese, phosphorus, sulphur, copper and tin are graphically exhibited in Fig. 5. It will be noticed that in this 0.07 per cent tin heat, the tin varied from 0.05 to 0.26 per cent tin.

If varying percentages of tin affect the physical properties of the subject material it would be noticeable in tests corresponding to different locations in the ingot, that is, from the butt to the top where the greatest tin concentration exists. Therefore, the balance of this heat was processed according to the usual practice identifying each slab weighing 1745 pounds each and measuring 4 x 32 x 64¼ inches. The slabs were hot reduced to 0.090/0.110 gage and cold rolled to 0.0375 gage and cut to 120-inch lengths.

Two annealing practices were followed one being the standard at time of processing the test which was approximately 1340 degrees Fahr., at the high temperature points and 1300 degrees Fahr. at the low point. The other set of sheets was annealed at 1280 degrees Fahr. at the high point, and 1260 degrees Fahr. at the low point.

The physical tests were taken in duplicate so that one set of each anneal could be tested immediately after pinch passing and the other after age-hardening for six weeks at room temperature. Each tensile test was analyzed for tin; of course the analysis did not conform to that of the ingot. Each tensile test folded upon itself showed a variation of 0.086 to 0.124 per cent in the tin content.

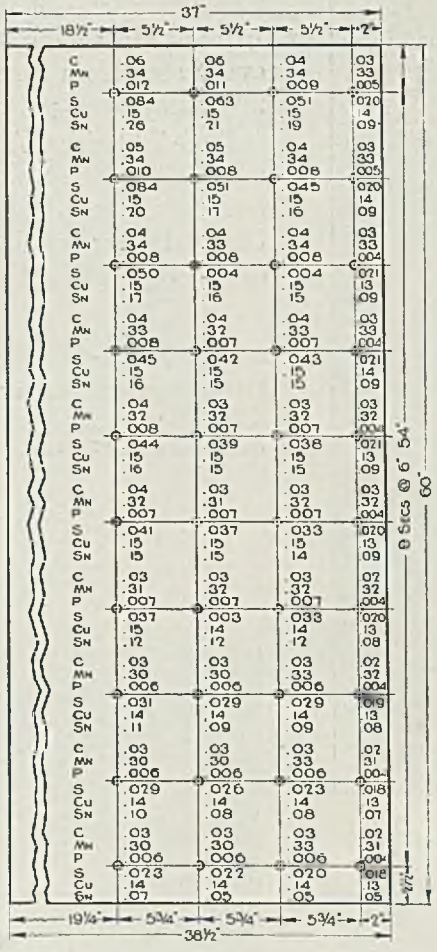

Fig. 5—Segregation test of a 24 x 39-inch ingot showing analysis at the various locations

The test values of the high temperature annealed material immediately after pinch passing were under 41 to 46 Rockwell, B scale, and over 0.422 up to 0.436 Olsen. Elongation was approximately 54.7 per cent in 2 inches, 45.4 per cent in 4 inches and 36.3 per cent in 8 inches.

The physical values of the lower temperature annealing system had Rockwell values up as high as 50, B scale, and Olsens around 0.428 to tion per cents were around 45.4 in one reaching 0.450 while the elonga- 2 inches, 35.4 in 4 inches and 26.3 in 8 inches.

Hardness Increased

In both cases after six weeks of age-hardening the Rockwell hardness increased 3 points except in one instance when it reached 5 points, the Olsen values decreased an average of 0.015-inch.

Some of the sheets were skin passed before they cooled down to room temperatures after annealing, while the standard practice is to skin pass at room temperature. In this respect it was shown that material skin passed with some heat in it would show an increased Rockwell hardness over that processed cold and that age hardening would be both rapid and extensive. We found after ageing that the Rockwell would increase anywhere between 15 and 20 points.

This investigation clearly indicates that there is considerable tin segregation in low-carbon rimmed steel and that increased tin content up to 0.124 per cent does not noticeably affect the physical values and, hence, the workability of the material. Tin contamination, however, may affect the work hardenability or/and the stiffness which has not been investigated.

Tin contamination can be far more extensive than previously contended. How high this concentration can exist before it causes difficulty in the performance of extra deep drawing sheets is not fully defined. One thing is conclusively shown, namely, higher tin contaminated steels can be applied thus permitting a lower cost scrap being utilized in open-hearth charges within reasonable limits. An intensive study of copper contamination in steel sheets failed to reveal any effect of this element

what's your I.Q. on this technical information?

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- ☐ Modernization of Benzol Plants
- ☐ Gas Purification Plants
- ☐ Continuous Ammonium Sulfate Driers
- ☐ Replacements and Spare Parts for Coke Plants (give details below)
- ☐ Material Handling Engineering Service
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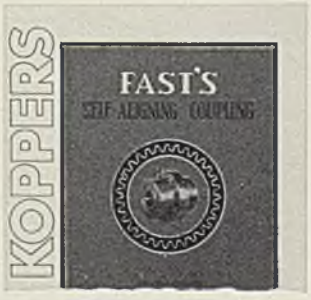

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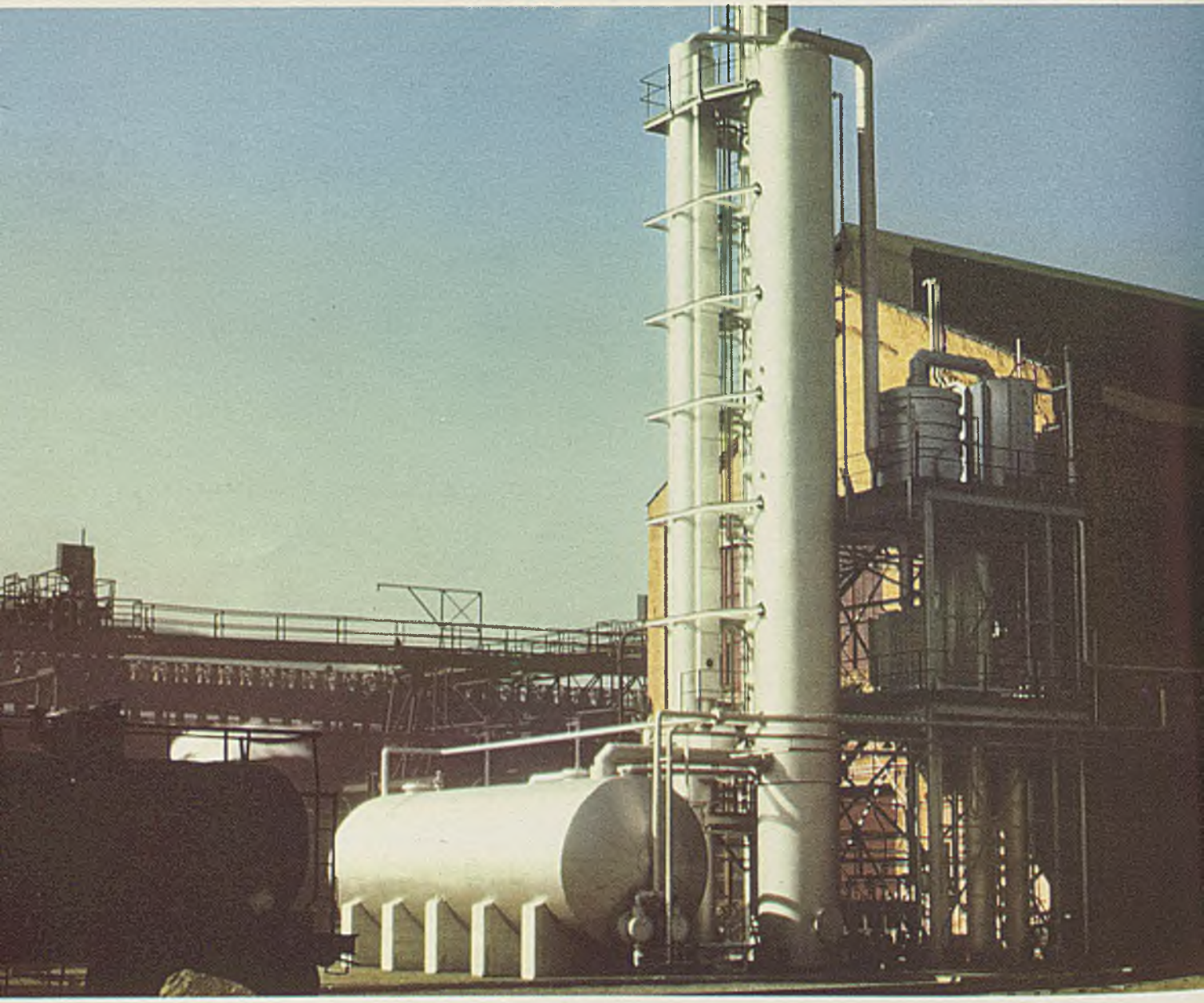

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Koppers can build your benzol plant better and more economically because this organization has been carrying an extensive research into the problems of light oil recovery and refining. This research has resulted in simplified design of equipment, materially reduced investment and operating costs and, above all, greatly improved quality of products. The Koppers plants have flexibility of operation to suit variations in market demands.

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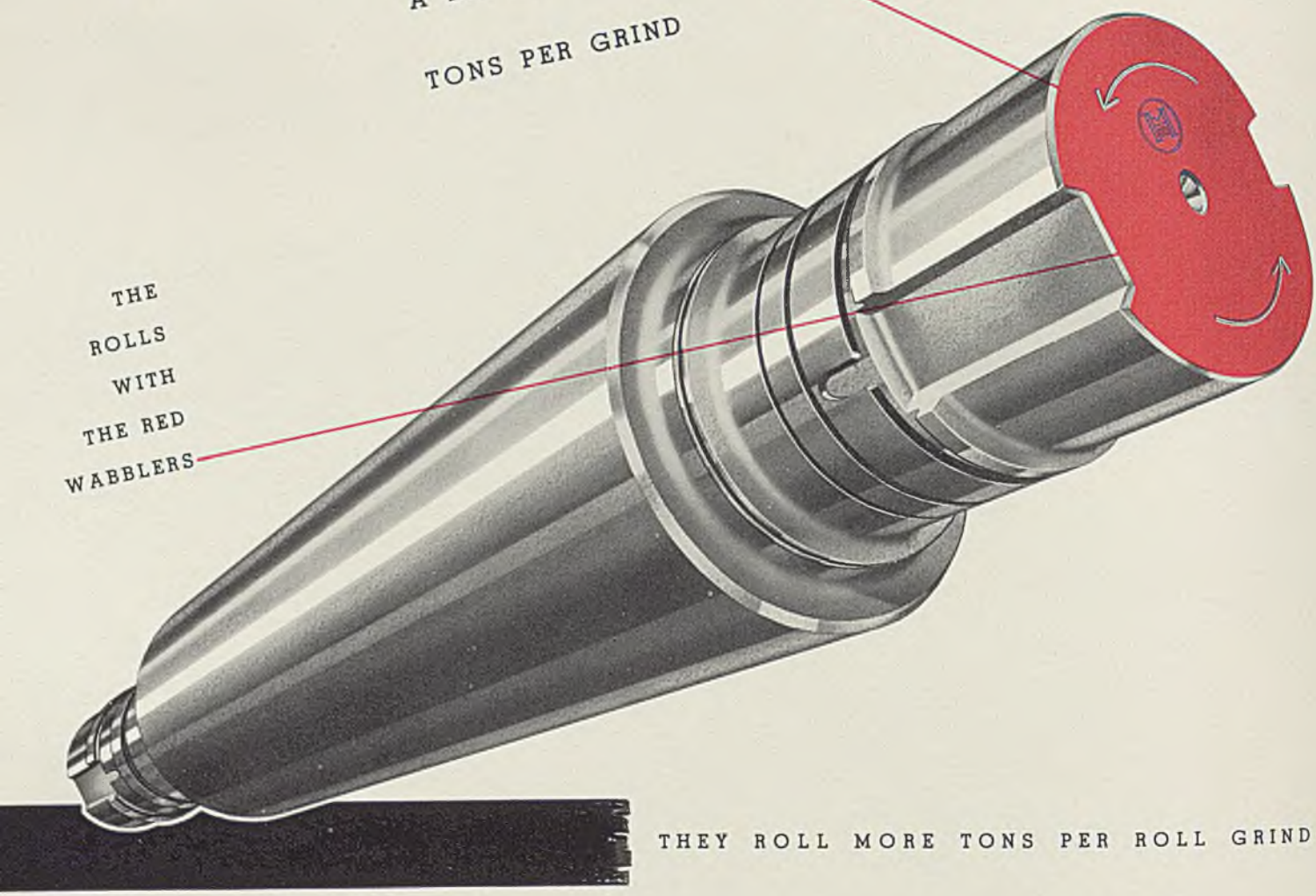
FAR-SIGHTED STRIP MILL OPERATORS DEPEND ON

"Techni" PROCESS WORK ROLLS FOR

A BETTER FINISH . . . MORE ROLLED

TONS PER GRIND

THE ROLLS WITH THE RED WABBLERS



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This is what the "Techni" Process means to you, Mr. Steel Man. It means rolls which give you exceptional tonnage. This statement has been proved over a period of years, in every type of rolling operation.

As applied to Strip Mill Work Rolls, these rolls are tougher, have fine grained necks and bodies, denser chill, and ideal response to heat. The method by which we get this extra quality in our work rolls is the use of the "Techni" Process developed exclusively by Mackintosh-Hemphill, which regulates the quality and grain size of the rolls with as much exactness as the best modern steel practice regulates the quality of steel.

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upon physical values of the steel.

Effects of chromium and nickel on the physical properties of deep drawing sheets were investigated to some extent. Steels having a chromium content up to 0.10 per cent and nickel up to 0.10 per cent apparently have no effect upon the physical properties of this grade of material. One thing seems apparent and that is an increase in stiffness. With identical physical values for Rockwell, Olson, elastic limit, ultimate strength and elongation existing in steels high and relatively low in alloy contamination, those having the higher alloy content were much stiffer to the sense of feel than the others. It is with regret that samples were not tested for stiffness.

Effect Is Problematical

One plant utilizing considerable quantities of fairly high arsenic ores in the blast furnace encountered difficulty with drawing qualities. The Rockwell values were high and the Olsen low with a fracture indicative of embrittlement. Inasmuch as the high arsenic content was thought to be a contributing factor toward failure, these ores were omitted from the blast furnace burden. The resultant steel sheets showed no improvement in physical results; in fact, the trouble was found to be with the annealing system. Whether or not testing for effects of arsenic content at plants utilizing such ores is warranted is problematical.

Fig. 6 shows location of tests on the individual sheet.

Chemical determinations of the heat were made by a rapid method so that they could be obtained between the melting time and the tapping time; these determinations were checked by the standard long method. This system also shows the short method to be fairly accurate. Several rapid methods were tried but were found to be inaccurate with steels containing high copper. Some criticism exists regarding the short method but it answered the purpose here; perhaps an improvement can be made which will influence the other elements.

The rapid method used in these tests is as follows:

Dissolve: 5 grams of sample in 50 cc of 1:1 HCl in a 500 cc Erlenmeyer flask.

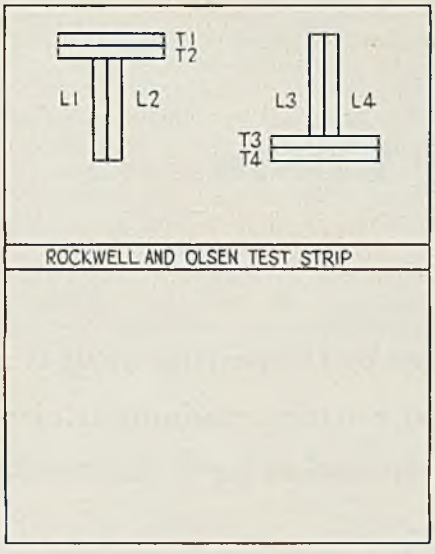
Dilute: to 200 cc and add ammonia dropivise until a slight but permanent precipitate forms. Too much precipitate defeats the object sought, i.e., the separation of iron.

Add: 2 grams of 10 mesh granulated zinc and digest at boiling temperature for five minutes.

Remove: from hot plate and filter on a 11 cm, No. 1 whatman paper; do not wash.

Return: The paper and contents to the flask and add 75 cc of concentrated HCl. Boil until the metallic zinc is dissolved and the paper completely disintegrated.

Dilute: to 250 ml. and add 0.25 grams



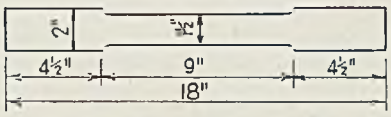


Fig. 6. (Upper)—Location on sheet at which test pieces were taken. (Lower) —Tensile test strip

of finely powdered metallic antimony. Connect by means of a 2-hole stopper and tubes to a source of CO_2 or N_2 and keep the flask and contents at the boiling temp. for 15 minutes while passing in sufficient inert gas to insure a reducing atmosphere.

Remove: Flask and gas supply from heat and transfer to a cooling bath while continuing the CO_2 or N_2. When cool remove stopper and tube from flask and filter quickly through a previously prepared funnel containing a cotton plug, into a 500 ml Erlenmeyer flask containing a few grams of $NaHCO_3$.

Add: A few ml. of starch solution and titrate immediately with potassium iodate solution to a permanent blue. The iodate is the solution used for sulphur in steel and contains 8.03 gms. KIO_3 per 16 liters of solution, 48.15 gms. KI, and 5.00 gms. NaOH. A blank should be analyzed and deducted, using a tin free sample such as iron by hydrogen or electrolytic iron.

Standardize the iodate as follows:

Dissolve: 0.6 gms. of C.P. tin and 2 gms. of K_2SO_4 in 20 ml of concentrated H_2SO_4 and dilute to 100 ml in a volumetric flask. Pipette 1 cc portions, add to several blanks, and run by the method as outlined.

1 cc of this tin solution = 0.006 gms. sulphur

1 cc of the iodate solution = 0.0012 gms. sulphur (approx.)

Predicts 11 Per Cent Building Gain in 1940

Continued recovery gains in reinforcing steel business depends on whether private construction can continue to increase in sufficient volume to offset declines in public construction activity, Thomas S. Holden, vice president, F. W. Dodge Corp., told 100 producers and distributors of reinforcing bars at the sixteenth annual meeting of Concrete Reinforcing Steel institute, at Hot Springs, Va., recently.

"The Dodge estimate of an 11 per cent construction gain in 1940 seems very likely to be attained, or even bettered," Mr. Holden said.

New officers elected: President, James D. Maitland, Colorado Builders' Supply Co., Denver; vice president, Blair M. Boisseau, Virginia Steel Co., Richmond, Va.; vice president, Ralph F. Healy, Igoe Brothers, Newark, N. J.; directors: James F. Curley, Concrete Steel Co., New York City; J. R. Fenstermaker, Hugh J. Baker & Co., Indianapolis; H. D. Jolley, Ceco Steel Products Corp., Omaha, Neb.; Charles M. Gunn, Gunn, Carle & Co., San Francisco; and E. W. Langdon, Joseph T. Ryerson & Son Inc., Chicago.

Directors whose terms have not expired are: H. E. Calves, Taylor-Davis Inc., Philadelphia; H. G. Daley, Sweet's Steel Co., Williamsport, Pa.; John D. Roberts, Central Texas Iron Works, Waco, Tex.; Ralph T. Rowles, Jones & Laughlin Steel Corp., Pittsburgh; F. H. Sparks, Knoxville Iron Co., Knoxville, Tenn.; W. H. Stewart, Truscon Steel Co., Youngstown; and S. V. Taylor, Concrete Steel Fireproofing Co., Detroit.

Warehouse Chapters Elect Officers

Additional chapters of the American Steel Warehouse association have elected officers:

Pacific Northwest: President, William R. Case, Seattle Steel Co., Seattle; vice president, William A. Haseltine, J. E. Haseltine & Co., Portland, Oreg.; secretary-treasurer, Everett W. Hawkins, Portland, Oreg.; national director, R. P. Mercer, Jacobs & Gile Inc., Portland, Oreg.

Wisconsin: President, George Gibbs, Gibbs Steel Co.; vice president, L. R. Moise, Moise Steel Co.; secretary-treasurer, George W. Smith, Jos. T. Ryerson & Son Inc., all of Milwaukee. Mr. Moise will also serve as national director.

Light Weight Alloy Is Welded Easily

A light-weight, high strength, rustproof alloy, No. 301, is now offered by Colonial Alloys Co., Colonial Philadelphia building, Philadelphia. It has good forming and drawing qualities and lends itself to gas, spot, seam and arc welding, brazing, soldering and reaction soldering. The metal has an ultimate tensile strength of 72,110 pounds per square inch and polishes to a silvery chromium-like appearance. Also, it is nonmagnetic and nonsparking. It can be furnished in sheet, plate, rod, bar, wire, pipe, tubing and extruded forms, in a long range of gages and sizes.

Steel Casting Costs

Proper design of the casting itself is most important for minimum cost. Proper pattern equipment also essential. Low costs require utmost co-operation between user and producer of the castings

By H. L. McCLEES

Crucible Steel Casting Co.*
Landsdowne, Pa.

■ BRING together a group of engineers or executives, give them a production problem to solve and the question of costs is almost certain to be the major topic under discussion. This brings up an important problem of the steel casting industry—the cost of steel castings to the user. This problem, to an extent seldom appreciated *by the user*, is one of great importance for it includes not only the initial cost of the castings but the cost of labor, material, etc. required to incorporate them into the user's finished products.

Careful examination of steel casting costs proves that two important factors are not always given sufficient consideration. These factors are: The proper design for cast construction and proper construction of the pattern equipment from which the castings are to be made.

Proper design is undoubtedly the most important element entering into the successful casting of steel structures. Naturally it affects steel casting costs. Such things as strength of materials, stresses, factors of safety, etc. lie strictly within the domain of the designing engineer. This is not the foundryman's forte. His talents and experience cover certain natural laws governing the solidification of molten steel, and its action in a sand mold. The foundryman is largely interested in the matter of design only insofar as it affects his ability to produce satisfactory castings. His judgment regarding specific changes in design will always be tempered with reason and compromise and will be based upon his knowledge of the fundamental laws governing the casting process, plus his experience in contending with their various limitations.

*Member, Steel Founders' Society of America.

To further assist the steel foundryman in producing good steel castings economically, proper pattern equipment is essential. In too many instances, inadequate patterns are furnished so he must apply his skill and knowledge of castings to make a perfect replica, regardless of how its construction conflicts with sound and economical molding or coremaking practice.

In the design of drop forged products, there exists a far greater degree of co-operation between user and supplier. The forging plant builds or has built to its specifications the dies needed to produce a satisfactory product. The proponents of welded construction made their greatest strides after demanding a free hand to redesign proposed structures in such a way as to get the best results out of the welding process.

When a mutually uneconomical situation exists between two interdependent industrial groups, there is usually a reason for it. The reason may be either good or bad but in either case its effects cannot be overlooked. The reason for the lack of closer co-operation between the steel foundry and the consumers' representatives may be due to habit acquired over a long period of years —a misconception that the two groups' problems are not of mutual importance.

In the case of the steel casting in-

Consultation between the designing engineer and the steel foundryman is urgently recommended

dustry and its customers, the responsibility for lack of full co-operation regarding adequate pattern equipment and satisfactory designs rests pretty largely upon the shoulders of the steel casting industry which has been too willing to pit its ingenuity against the odds of difficult and often impossible designs and the use of defective pattern equipment.

Service of Castings Increased

Continued increase in the use of steel castings is of economical importance to all of the durable goods industries. Steel castings have thoroughly justified their growing acceptance by industry. Great strides have been made in increasing their serviceability. Users have asked for maximum strength with minimum sections, higher physical properties at elevated temperatures or at subzero temperatures, minimum machining allowances, close unmachined casting tolerances, increased specification requirements and more critical inspection generally. The steel casting industry itself, through competition between producers, is largely responsible for such improvements in the industry's products.

The demand on the part of steel casting users for more intricate and complex structures subject to higher specification demands, etc. tends to increase steel foundry costs. Prevention of further increases in cost is a joint problem for both user and foundry. When a part is designed or redesigned, consultation with the foundry is recommended so best possible results may be obtained from standpoint of both user and producer.

Steel foundrymen are thoroughly aware that decreased costs may be achieved by increasing volume. This economic principle increases the ability of goods to move more speedily from production toward the point of need. To this extent, cost is important. But due to the great variety of products required of the steel foundry, mass production methods are seldom possible. How, then, can the cost of steel casting be lessened or the volume increased?

The quality of material and workmanship must not be sacrificed. Rather, continued improvement is necessary. The solution of this mutual problem would seem to lie pretty largely in increased co-operation between buyer and seller to protect and promote their joint interests.

Full co-operation will be found to pay dividends. This is a plea to both foundrymen and users for a tolerant and receptive attitude in matters of design and pattern construction. Such an attitude will benefit each of the interested parties both as regard improved quality of products and by keeping down production costs.

The steel foundry can offer helpful advice regarding adequate cost-saving pattern equipment

Beam Splicing by Welding

OFTEN in construction work it is desirable to splice structural seams of various cross sections. In such instances it is necessary to determine the size of plate to use.

A completely welded butt joint might be satisfactory for connecting an I-beam according to A. N. Kugler, mechanical engineer, Air Reduction Sales Co., 60 East Forty-second street, New York. He points out, however, that it would be more costly than splicing with straps and plates. The completely welded butt joint would probably receive consideration only when the straps and cover plates could not be permitted.

However, in general the splice with straps and plates can be used. Where no limitation of bending at less than the safe resistance of the beam can be assured, the splice should have the same bending moment as the beam.

Shear strength should be calculated for the maximum load when the splice occurs adjacent to a column support. Connections of this type should be investigated carefully for positive and negative bending moments, particularly if any continuity is involved in the beams.

Beam to be spliced is designed for bending moment M and shear S. The cross section of the top bars and cross section of the bottom bars should each be sufficient for tension or compression equal to M divided by the depth of the beam. Fillet welds connecting these bars to the beam flanges are made sufficient in size and length to transmit the same stress.

Two Bars More Economical

A single bar could be used instead of two bars along top flange, but a single bar would have to be twice as long or be attached by welds of double size because a single bar would eliminate two of the four longitudinal lines of welding. For large beams, use of a single top bar would be decidedly uneconomical due to excessive bar weight or volume of welding or both. Several trial calculations may be necessary to determine the most economical length of bars.

The web splice is designed for the shear S, the weld size and length being calculated and the splice plate thickness being made the same as the weld size. This is the way plate thickness is determined. Vertical welds only should be figured as resisting the shear S. Horizontal welds are assumed to act only in resisting the moment of the couple formed by the vertical weld stresses.

Width of splice plates should be at least six times their thickness to avoid abrupt changes in direction of stress. Abutting parts of the beam should not be in contact at any point.

No welding code today, so far as is known, has set up standards for splicing beams by the use of welding.

A rough method of approximating the desired splice strength is to make the cross section area of the straps equal to or slightly more than the beam flange areas and to make the web cover plates on each side somewhat more than half the web thickness.

Automatic Batch Carburizing

New method found to reduce operating costs substantially, to give case of any specified depth desired. Work is done at high speed. Uniformity excellent. No packing is needed

■ WHEN carburizing by a new batch method, the operator has control of various factors entering into the operation. Any of them can be varied while the rest are held constant, thus making it possible to improve successive batches of parts until conditions that give ideal case structure are determined. Once these conditions are found, they can be repeated automatically batch after batch by the new method. This procedure is particularly adapted for high-speed mass-production work. Low cost is assured since rejects are practically eliminated.

The method utilizes comparatively small furnaces of the vertical circular type in which a fan located at the bottom of the furnace just below the load is employed to swirl the carburizing gas at full carburizing temperature into every crevice of work. This short-path forced-convection method develops the carburized case at a rapid predictable rate that is practically the same for parts of any size, regardless of the density with which they are packed into the furnace which is built by Leeds & Northrup Co., 4901 Stenton avenue, Philadelphia.

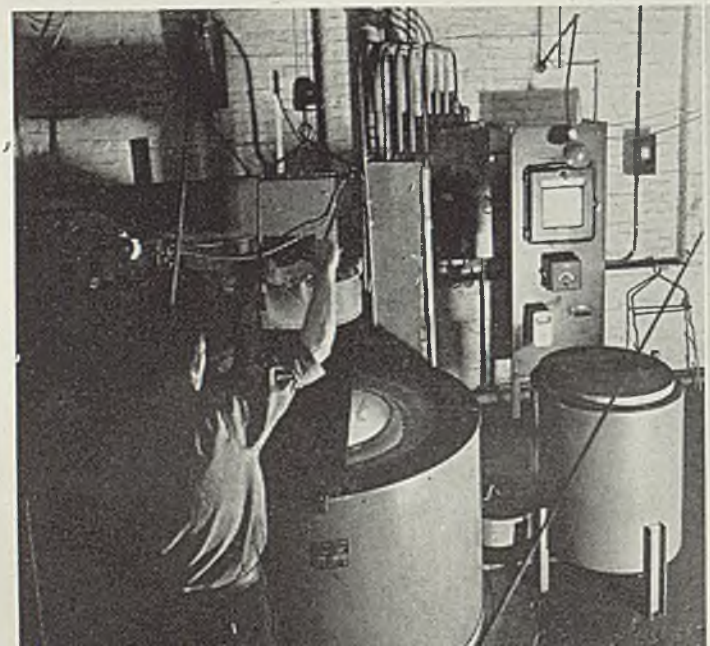
While the short-path forced-convection furnace itself is not new in heat-treating work, being widely used for hardening, tempering and nitriding, its use as a carburizing furnace is comparatively new. Fig. 2 shows typical arrangement of various portions of the equipment. What converts this furnace to carburizing work is the introduction of a specially prepared hydrocarbon fluid to the chamber where it is cracked inside the furnace into a gas rich in carbon and uniform in chemical analysis. Fig. 2 shows tank of fluid connected to motor-driven injector pump which is set to give the flow desired.

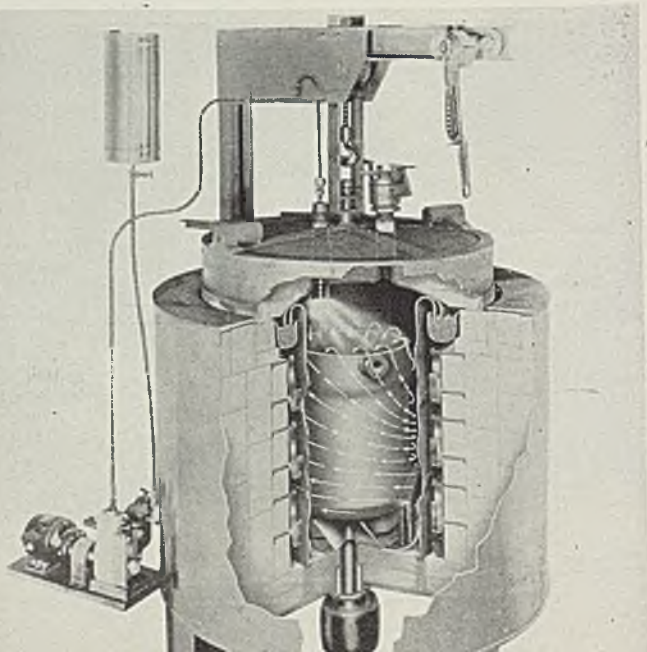
Flow of carburizing fluid to the furnace is controlled by a dial on the injector pump. This dial is calibrated in fractions of pints per hour. The control permits any desired rate of flow to be maintained within extremely close limits. The flow can be observed through a peep-gage at the furnace.

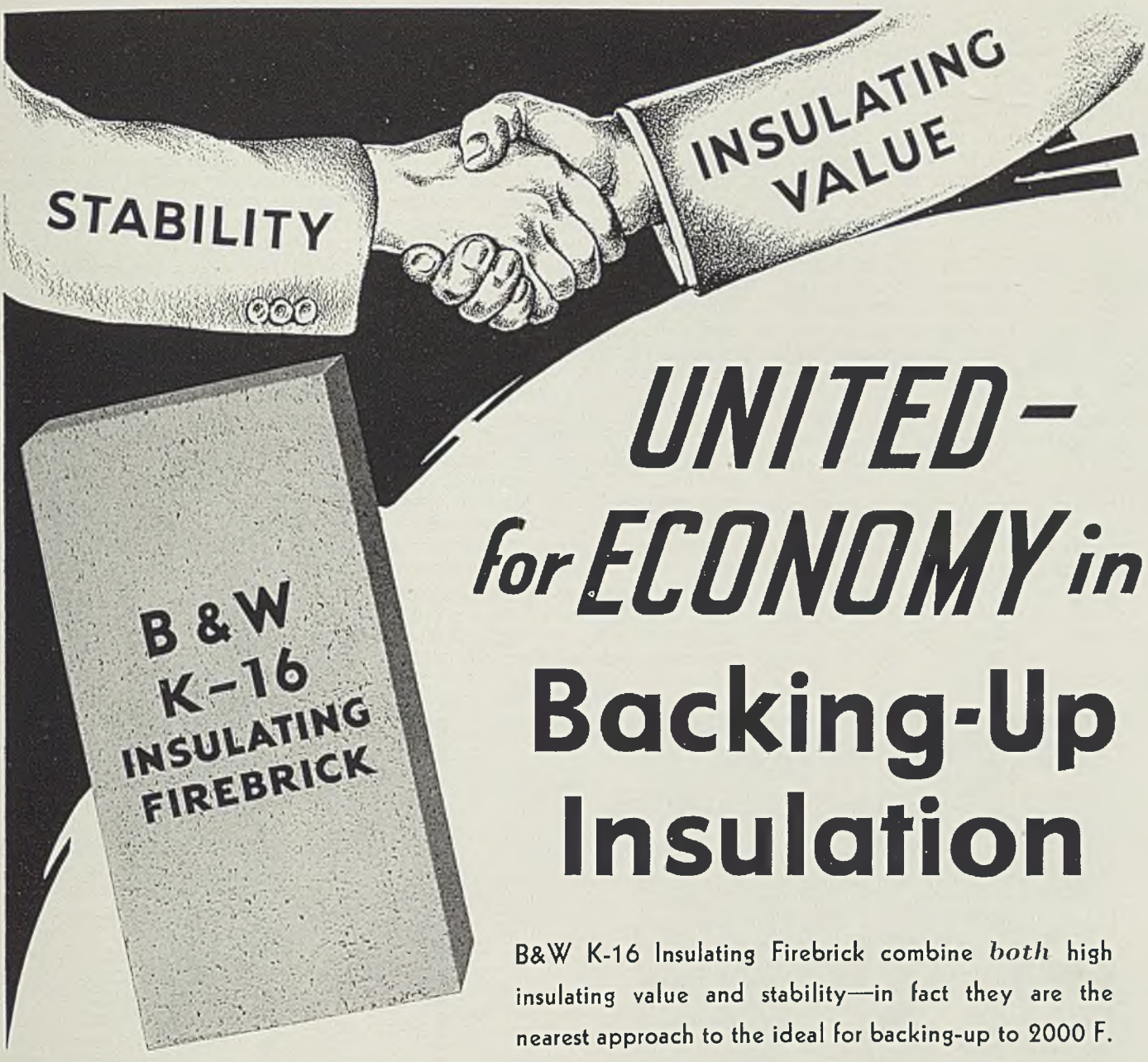
The complex chemistry of the carburizing process makes necessary a carburizing gas of known and constant composition. Much of the success of the new method is due to the chemical dependability of the carburizing gas made in this furnace by cracking the specially prepared hydrocarbon fluid. Procedure here is to inject this fluid into the furnace as soon as the parts are

Fig. 1. (Left)—This furnace is carburizing typewriter ball bearing races which are quenched directly from the carburizing temperature

Fig. 2. (Right)—Sectional view showing equipment involved in carburizing method described here. Photos courtesy Leeds & Northrup Co., 4901 Stenton avenue, Philadelphia







UNITED— for ECONOMY in Backing-Up Insulation

B&W K-16 Insulating Firebrick combine *both* high insulating value and stability—in fact they are the nearest approach to the ideal for backing-up to 2000 F.

Made of special Georgia kaolin, by an exclusive process, B&W K-16's are a fired-clay refractory. Because they combine exceptional insulating value with great stability, less material is needed for a given heat-flow—hence savings up to 40 per cent can be made by selecting K-16's for industrial furnaces.

Technical proof is yours for the asking—without obligation, of course.

This Bulletin — R-18 — gives authoritative information on backing-up to 2000 F.

Write for a copy.

R-101

THE BABCOCK & WILCOX COMPANY
REFRACTORIES DIVISION: 85 LIBERTY ST., NEW YORK, N. Y.

BABCOCK & WILCOX

hot enough for a carburizing atmosphere to be effective. Provision is made so amount of fluid injected and thus the character of the carburizing atmosphere can be regulated closely and can be changed at any time to meet the needs of either an actively carburizing cycle or a diffusion cycle as may be desired.

In the furnace the carburizing gas is washed directly into and through the load by a big high-pressure fan in the base of furnace. Gas thus is swirled into every possible crevice of the load, obtaining both uniform gas distribution and temperature throughout.

Carburizing by this method requires no packing of the work as parts are put into the furnace bare for exposure to the carburizing gas. Large parts are loaded either in the furnace baskets or on fixtures. Small parts simply are dumped into baskets or trays. Uniform carburizing action occurs with parts touching each other in any way except, of course, with flat surfaces in direct snug contact. Also, due to the rapid circulation through the load, each part develops a uniform case all over, regardless of whether it is at top, side, center or bottom of the load in the furnace.

This is demonstrated by the photomicrographs, Fig. 3, which indicate well the uniformity of the case produced. The specimens numbered 1 to 6 were taken from portions of the load at the locations diagrammed in sketch accompanying Fig. 4. As will be noted, these include three points near the outer edge of the furnace at top, center and bottom and also three points near center of charge at top, center and bottom. If any variation were to occur, it should show in a comparison of test pieces from these six different locations. However, referring to Fig. 3, it will be seen the micrographs are practically identical, showing the uniformity of case obtained by this method. Depth of case is marked alongside micrographs to give a ready comparison between the six different specimens.

Similarly, tests were run to determine temperatures at these six different points by locating a thermocouple at each of these six places and recording the temperatures as the load was brought up to heat. As can be seen in Fig. 4 where the numbers show temperatures at the various locations plotted against time, it is interesting to see how closely these are grouped, even when the load is coming up to heat. When load has reached temperature desired, it will be noted there is less than 10 degrees maximum difference between any two points in the charge. These tests possibly are the most severe that could be applied as the load used consisted of 1200 pounds of 1 x 6-inch rounds of SAE 1020 steel simply dumped at random into the furnace basket and held at 1700 degrees Fahr. for four hours.

Since total amount of carburizing gas produced in the furnace as well as rate at which it is produced can be controlled with utmost exactness by means of the injector pump, it is possible to apply automatically any carburizing cycle desired.

Furnace Heated Electrically

Similarly, automatic control of temperature is provided. Furnace is heated electrically by heavy chromium nickel ribbon which hangs on hooks embedded in the wall shown in sketch, Fig. 2. Basic design consists of work surrounded by heater, which in turn is surrounded by exceptionally thick and continuous insulation to produce a unit with high thermal efficiency. The floating wall retort is self-sealed in sand seals at both top and bottom. Since retort is entirely inside the furnace and surrounded from top to bottom by the heating unit, transfer of heat is extremely uniform and is assisted by the proper proportioning of furnace parts. The design also minimizes radiation to outside air. Furnace is protected against overheating from any cause by a gold fuse at bottom of furnace heating chamber, Fig. 2. This fuse will melt to shut down the entire equipment before a dangerous temperature is reached.

Thermocouple registering temperature is located in the base near the

(*Please turn to Page* 82)

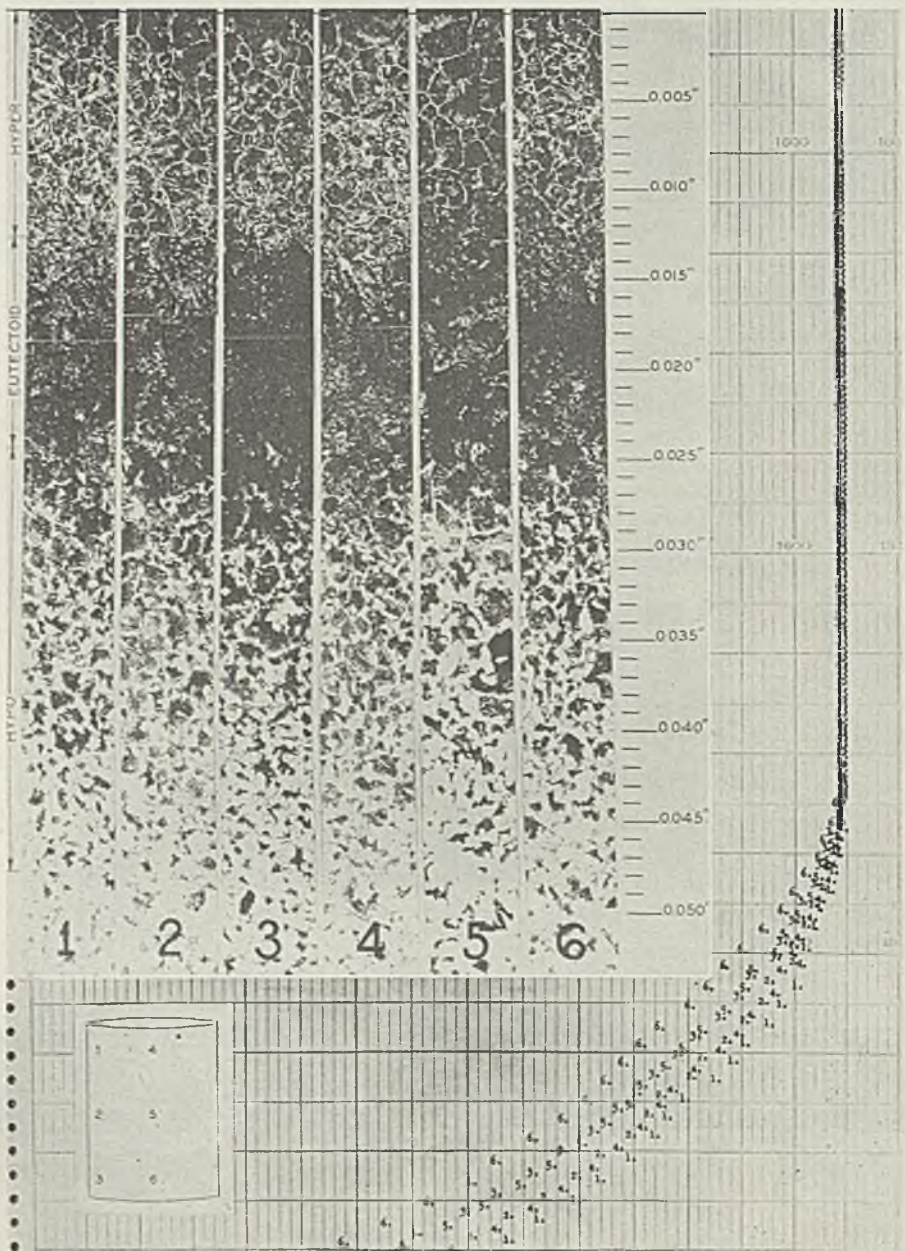


Fig. 3. (Upper left)—Micrographs showing grain structure at depths below surface noted along right margin. Taken at the six different points in the load shown below, these tests are evidence of excellent uniformity in depth and character of case

Fig. 4. (Below and at right)—Chart record of temperatures at the six different points in the dense load of 1200 pounds of 1 x 6-inch rounds of SAE 1020 steel held at 1700 degrees Fahr. for 4 hours. Note how closely readings coincide after warm-up period

Have a look yourself

To you, merely a bolt . . a common product used in thousands of places.

To the trade . . perhaps a ⅞x8-inch bolt of a type sold by the hundreds of thousands for industrial fastening.

To us, however, it's more than that . . it represents 95 years of bolt and nut manufacture, pioneering in methods and machines, development of tools and finish . . a product of pride, no matter how small.

Have a look for yourself at this R B & W product. Check its accuracy of thread. See how easily a nut starts and spins down. Test its tensile strength, and even study microphotographs of the flow of the metal. Note the accurately formed head, clean threads, smooth finish and its outstanding appearance. You will find that this cold-headed bolt possesses properties that are unique for a bolt of this size.

R B & W pioneered the making of bolts and nuts almost a century ago, and today still leads in the production of a quality product. From a small beginning, three plants have grown at important locations . . facilities have been built for adequate stocks to meet all needs . . a sales-engineering service has been made available to advise on fastening recommendations. There is no substitute for quality . . especially when backed by the guaranteed service and honest customer-relations for which R B & W is outstanding.

BOLTS EMPIRE NUTS-RIVETS

RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY

PORT CHESTER, N. Y. ROCK FALLS, ILL. CORAOPOLIS, PA.

Industrial Trucks

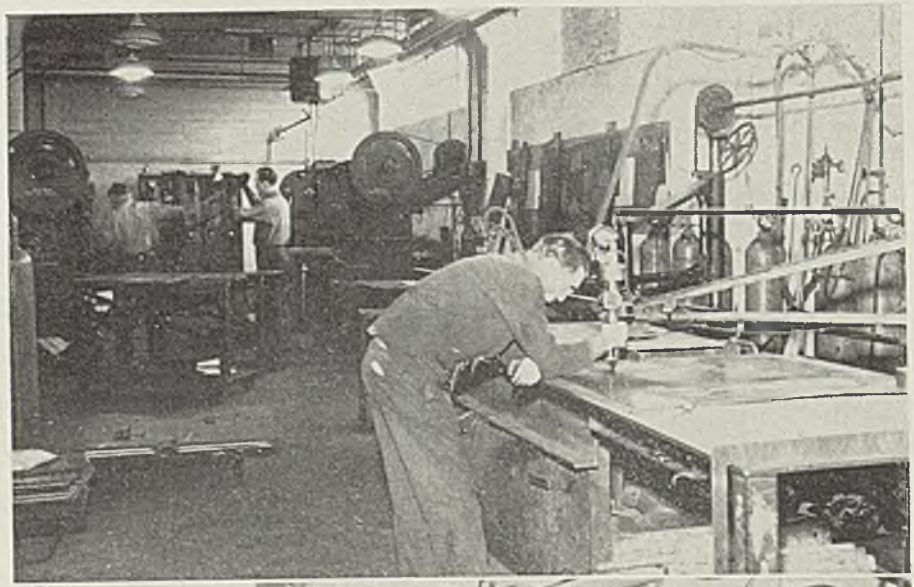
Units are completely arc welded from sheared, flame cut or sawed steel plate. Bends reduce amount of welding needed. Embossing die is made economically by welding, heat treating

By FRED STEWART

Foreman, Welding Department
Yale & Towne Mfg. Co.
Philadelphia

■ HEAVY power-driven industrial trucks in a large variety of sizes, shapes and styles are made at the Yale & Towne plant, 4530 Tacony street, Philadelphia, using arc welding entirely as the fabricating method and steel plate as the material for frames, platforms and many parts.

The welding shop occupies a rectangular area about 65 x 200 feet extending north and south along one side of the plant. Several tons of steel plate from ⅛ to 4 inches in thickness are stored about half way down one side of the room. At the north end of the shop are a number of punch presses. The one in the northeast corner handles holes up to 13/16-inch in diameter in ½-inch sheet and the large one in the northwest corner handles up to 3½-inch diameter holes in 5/16-inch material. In addition, there is a third smaller punch and notching unit used to shear corners and angles.



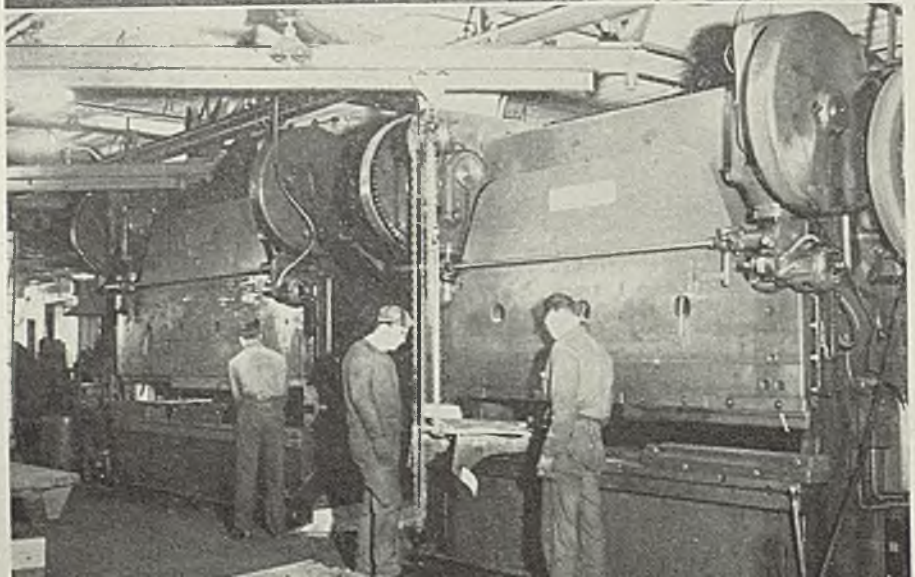


Fig. 1 shows view looking to the north in the plate-preparing center. In immediate foreground is a pantograph oxyacetylene cutting unit which is capable of operating two torches simultaneously. No stack cutting work is done here as production of industrial truck frames is not on a quantity basis but rather is done one or two at a time. Truck frames in many instances are designed and constructed to fit a particular set of working condi-

Fig. 1. (Upper) — Plate preparation Pantograph oxyacetylene cutting outfit at near right, punching-trimming presses shown in rear

Fig. 2. (Lower)—Heavy presses shape many parts, thus minimizing number of welds required in an assembly. Units also used in straightening and embossing operations

Advertisement

Stressproof News

T. M. REG. U. S. PAT. OFF.

Presenting News of a New Cold Finished Steel Bar

By LA SALLE STEEL COMPANY **Chicago, Illinois**

EXTRA! STRESSPROOF No. 2 is the trade name for La Salle's new cold finished bar steel possessing remarkable wearability, high strength, free machinability, and non-warping qualities *right in the bar*. It requires no heat treating or carburizing.

SPENDS $24 MORE FOR STEEL AND SAVES $550

Machine Tool Maker Replaces SAE 1045 for Lead Screws

Positive that production costs on a certain type of lead screws were running unnecessarily high, a midwest machine tool company several months ago determined to try a different grade of steel. Four bars of STRESSPROOF were ordered out and machined for lead screws approximately the full length.

Detailed cost records were kept, and when analyzed, disclosed results nothing short of spectacular.

Saving of 31 Per Cent

For the total cost of the four screws, which had run up to $1,800 when using SAE 1045, had dropped to about $1,250—a clear saving of $550 or about 31 percent. More interesting still, the material cost of STRESSPROOF was shown to have been $24 higher than that of the former grade.

The sensational saving was attributed mainly to STRESSPROOF'S resistance to warpage. Its remarkable uniformity of hardness across the section kept warpage in machining to a minimum and so eliminated several costly straightening operations. Moreover, because the STRESSPROOF bars could be machined at higher speeds, a significant saving in time resulted. These savings, plus the fact that the new steel has adequate strength and resistance for the purpose, have produced another loyal STRESSPROOF user.

R.G. Haskins Uses New Bar Steel in Air Controlled Tapping Machine

Famous Machine Tool Maker Turns to STRESSPROOF For Improved Performance

From the files of the R. G. Haskins Company, Chicago, comes another dramatic account of what happens when a firm keeps a constant look-out for ways of maintaining and improving quality of product and holding down production costs.

The Haskins Company, it need hardly be said, is one of the Nation's leading manufacturers of high speed tapping machines and flexible shaft equipment. For many years the company's products have held the respect of industry throughout the World for their dependability and service.

With a reputation like that to guard, Haskins' engineers naturally take a thorough look at every new development that might be of help. So when they heard about STRESSPROOF, and the many claims made for this new Cold Finished Bar Steel, they decided on a thorough investigation—particularly in view of certain difficulties with the shafting then being used in their high speed tapping machines.

The Heat Treated SAE 4140 used for pulley drive shaft (shown below) had been behaving badly. It warped excessively during machining and rejections because of cracks were running high. It machined slowly and was tough on tools. STRESSPROOF looked like a "natural" and was given a trial. Here are the results:

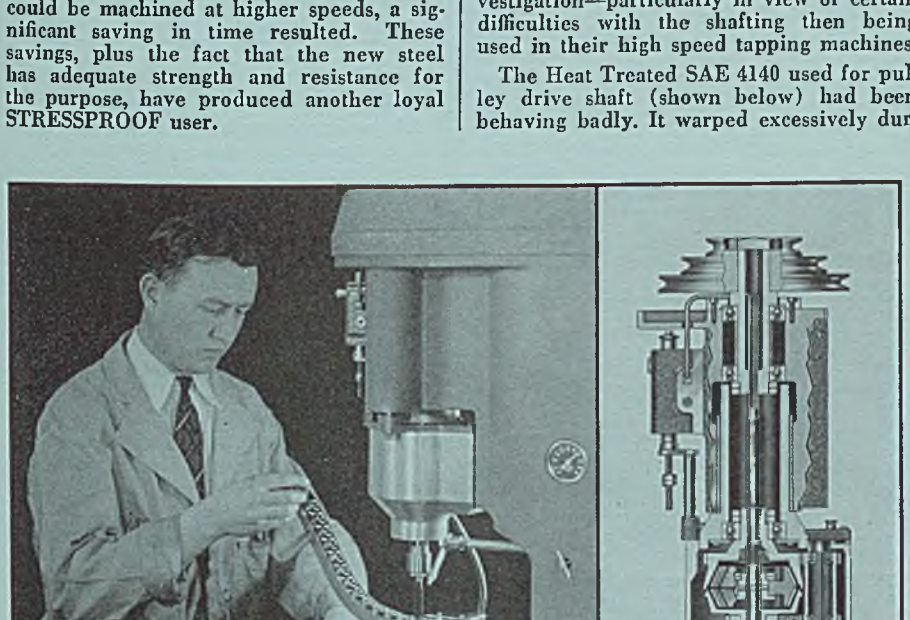
Machinability was immediately increased 25 surface feet per minute. Even cutting in the spline was accomplished without frequent sharpening of the hob. Warpage during machining — and therefore several straightening operations — was eliminated. And together with all these qualities—a high degree of machinability, resistance to warpage, a lower material cost — the strength of the STRESSPROOF shafts was more than sufficient to carry the strain of high speed, heavy duty tapping.

A second example where STRESSPROOF Cold Finished Steel Bars solved a cost and quality problem for this company was the splined drive shaft (shown in the illustration below). Here the use of SAE X-1314 left much to be desired in the way of accuracy and straightness. To get the necessary wearing qualities, the part was, of course, case carburized. This caused distortion in the shaft, which in turn made necessary several costly straightening operations. When STRESSPROOF was substituted, straight shafts were produced without difficulty. With a high degree of resistance

(Continued on Page 2, Col. 1)

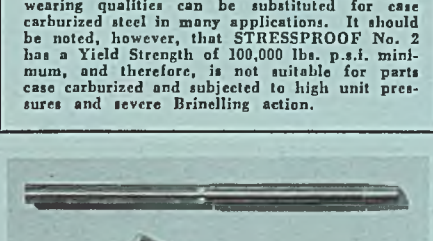
When Not to Use STRESSPROOF No. 2

STRESSPROOF No. 2 by reason of its unique wearing qualities can be substituted for case carburized steel in many applications. It should be noted, however, that STRESSPROOF No. 2 has a Yield Strength of 100,000 lbs. p.s.i. minimum, and therefore, is not suitable for parts case carburized and subjected to high unit pressures and severe Brinelling action.



LEFT: Haskins Air Controlled Tapping Machine in operation. Machines like this are in use all over the world. By replacing steels formerly used for shafts with STRESSPROOF the Haskins Company maintained rigid standards of quality at substantial production savings.

RIGHT: Cut-away view of the tap head of Haskins Tapping Machine. The two shafts indicated are currently being made of STRESSPROOF.



Close-up views of shafts used in tap head of Haskins equipment. The top one is the splined drive shaft, formerly made of Carburized X-1314; the bottom one is the pulley drive shaft, formerly made of Heat Treated 4140. Both steels were replaced with STRESSPROOF.

HASKINS ENGINEERS ARE SOLD ON NEW BAR STEEL

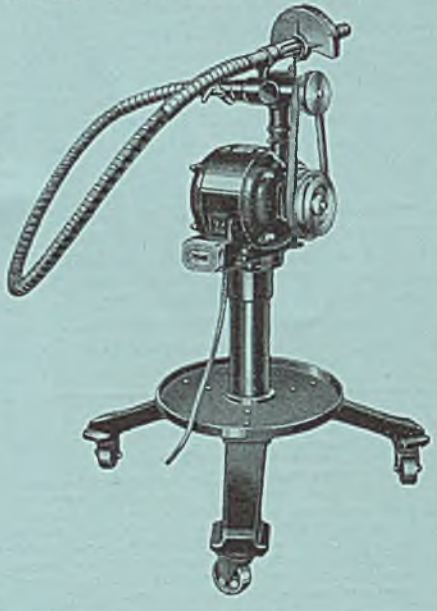
Replace H. T. 4140, Carburized X-1314, SAE X-1112

(Continued from Page 1, Col. 3)

to abrasive wear *right in the bar* as received, case hardening and subsequent straightening and cleaning were naturally no longer required. Broaching and splining were reported as excellent. And the savings in time and reduction of rejects lowered parts costs beyond all expectations!

Haskins reports finding in STRESSPROOF the solution to still another problem — this time in connection with their flexible shaft machines. The shafts on this equipment take a terrific beating at the high speeds — often up to 7,500 R. P. M.— at which machines are operated. The core ends of shafts were the seat of the trouble. With the steel formerly used, SAE X-1112, core ends got so hot that they turned purple, and virtually twisted off. Because of thinness of the section the use of heat treated or hardened steels with greater torsional shear stress values was out of the question. With such steels warpage would invariably occur.

A trial of STRESSPROOF No. 2 on this killing application soon proved this new all-purpose steel could stand the gaff. With its minimum yield point of 100,000 lbs. p.s.i and tensile strength of 125,000 lbs. p.s.i., it proved to be the *only* steel with the required torsional shear stress values that could be satisfactorily used in this application. The STRESSPROOF core ends didn't twist. And the freedom from warpage experienced with STRESSPROOF eliminated all worry about distortion.



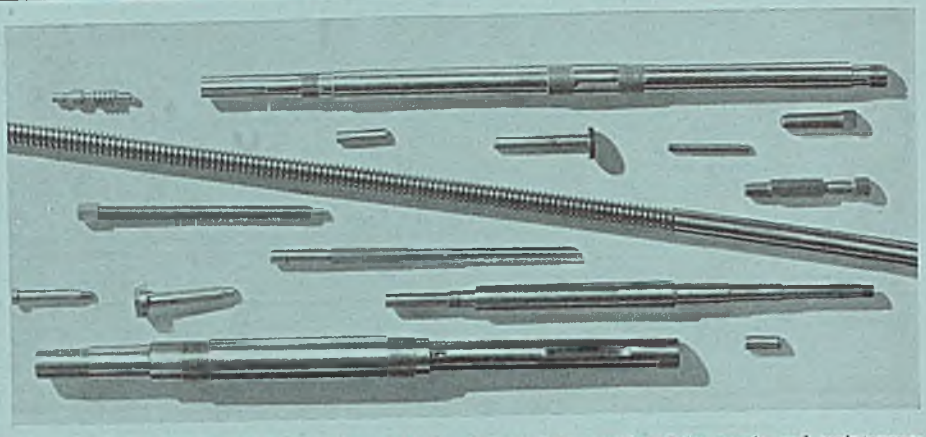


Photo of a few of the many different kinds of parts being produced by repair and maintenance departments from a single grade of steel, STRESSPROOF Cold Finished Steel Bar Shafting. This steel outlasts regular shafting in most applications, often replaces alloys, requires no heat treating.

More Shops Simplify Maintenance, Cut Costs by Adopting "All-Purpose" Steel Bar for Repairs

Replace Cold Drawn, Heat Treated Carbon, Alloy Shaftings

Recent reports from every part of the country indicate that the troublesome problem of replacing broken parts is being solved by a constantly increasing number of shops with one word: "STRESSPROOF."

According to the men in charge of repair and maintenance, this one grade of steel meets just about every requirement of the ideal shafting and machinery steel. It's strong. It's unusually free from warpage. It's easy to machine. It doesn't have to be heat treated. It wears remarkably well. And, for most parts, it's a more economical steel to use than any of the other shafting steels such as a cold drawn, a heat treated carbon, or an alloy.

Engineers who have used it in place of cold drawn shafting maintain that STRESSPROOF often doubles the service life of parts, thereby reducing costly breakdowns and down-time losses. They report no trouble with warpage, and a step-up in machinability. In many instances where it has replaced alloys and heat treated carbon steels—at no sacrifice in service life of parts—material costs have been pulled down, warpage troubles eliminated, and machining made easier and speeded up.

One prominent manufacturer has put into writing his experience with STRESSPROOF. His letter reads:

"As you know, we have always experienced considerable breakage of various bolts and pins that are used on the repairs of screw machines. Heretofore, we have been using 3140 Heat Treated for this class of work, but at the suggestion of your Mr. James we tried your Stressproof which we find gave us at least ten to twelve times the service that we obtained from 3140. We are very well satisfied with the performance of this material for all applications where hardness is not required with strength.

"You may be interested to know that the bolts which we returned were used for pivots for the collet closing arm on a Model No. 53 and 55, four spindle screw machine and these of course are always subject to considerable strain."

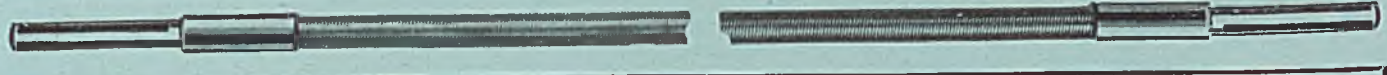
A composite comment of the experience of users of STRESSPROOF for shop repair parts would run something like this: "We've entirely forgotten problems like hardening, warpage and machining. We no longer worry about what steel to use for each application. STRESSPROOF is suited for just about any maintenance job we run into."

LEFT: Haskins Type HS-7 Flexible Shaft Equipment, one of many related machines produced by the firm. The line includes equipment made to deliver speeds of 7,500 R.P.M.

BELOW: Flexible Shaft Core as used in Haskins equipment. Core ends are made of STRESSPROOF. As formerly made of SAE X-1112, the core ends twisted off because of intense heat generated in operation. STRESSPROOF completely solved this problem.

Quick Service on STRESSPROOF Assured Users by Jobber Stocks

It's serious enough to be "out of stock" on steel used for repair parts when a machine breakdown occurs. But it's even more serious when you can't get prompt delivery of a new supply. To help maintenance and repair men side-step such hazards, La Salle Steel has established jobber stocks of STRESSPROOF at strategic locations all over the country. So when plants standardize on STRESSPROOF as a maintenance steel, they not only simplify inventories and cut part costs, but they insure themselves of prompt service on emergency requirements. That's a point no plant can afford to overlook when purchasing steel for production uses.



tions. Few units are made for stock due to these conditions. Thus multiple stack cutting of parts is unnecessary. However, a large number of steel templets are used as they facilitate exact reproduction of similar parts. The cutting torch is manually guided over the templet as in Fig. 1.

Shown in the background in Fig. 1 are two of the punching and notching presses. Between the pantograph cutting bench and the punches is a bench for cutting operations using hand torches.

Fig. 2 is a view of the two large bending brakes employed to form various portions of the trucks. Extensive use of bending brakes has done much to minimize the total amount of welding required, thus reducing cost of manufacturing operations. These two brakes are located end to end and extend lengthwise the shop near its center. Thus they are not only handy to the stock of plates but material which has been cut at the back of the shop can be formed as it is passed toward the front of the shop for assembly. Brake in foreground, Fig. 2, is a 10-foot unit with a capacity of 200 tons. Other brake is 12-foot unit with 300-ton capacity. Just beyond this second brake is a 10-foot shear, capable of cutting ⅜-inch plate. Farther up toward the front of the shop are the welding and grinding stations. At the latter, welded frames are finished by grinding off welds and cleaning up the metal surfaces.

A large portion of the steel used is SAE 1020 but certain portions such as frame bars are SAE 3140.

About 30 per cent of the plate—that is, most work up to ½-inch in thickness—is sheared to the shape desired.

Flame cutting is employed largely to cut to shape about 50 per cent of the work, material in the thickness range from ½ to 3½ inches. The remaining 20 per cent is usually sawed.

Bearing Blocks Are Torch Cut

Only a small amount of the steel is machined, most of it going directly to welding stations after being cut to shape and bent. One exception is pieces for bearing blocks which first are torch cut from heavy plate and then machined all over.

Wherever possible, subassemblies are utilized. As many of the smaller pieces as possible are welded to form a subassembly before these subassemblies in turn are welded together to form a completed truck.

In welding certain subassemblies, it is difficult to avoid some distortion, which subsequently is taken out on one of the large bending brakes or heated with a torch to bring it back to proper shape.

Certain portions of the trucks are heat treated. For instance, frame bars are heat treated to strengthen them. Bushings are carburized to reduce wear.

Wheels for Yale trucks are made here also. The circular wheel disk first is cut from alloy manganese steel plate. The tire rim is made by rolling a thinner plate which subsequently is welded to the disk, bearing mountings welded in place and the entire piece machined for tire and bearings.

Assembly work is done on bedplates as shown in Fig. 4. Pieces first are tack welded in correct position and then welds completed. Few jigs are used, the individual pieces being positioned separately as they are assembled into the structure.

All welding is done with the electric arc, using coated electrodes.

After welding, structures go to the nearby grinding department, Fig. 3, where welds are ground smooth and all rough edges smoothed up in preparation for painting. Various portions of the truck such as platform, hoist guides, main frame and understructure then are sent to the assembly department ready for assembly.

An interesting application of welding was worked out in this shop. It was desired to emboss the heavy plates forming certain portions of the truck with the name "Yale." To do this a heavy embossing die was needed. It was made by taking heavy plate and punching through it the letters to form the name desired. These punchings then were drilled and plug welded on the face of a second plate to form the male section of the die.

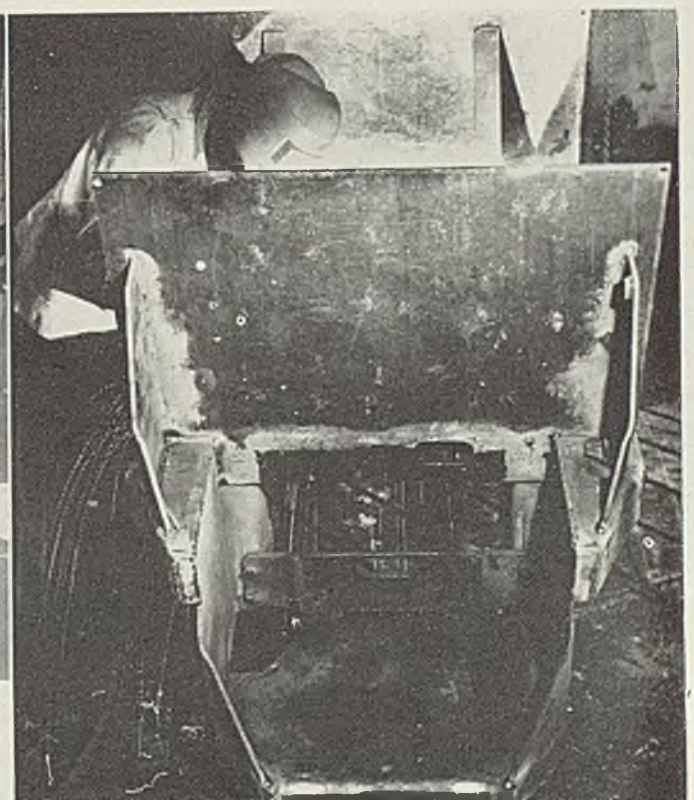
Lugs were put on the back of the plate to fit one of the heavy bending brakes which is utilized to give the required pressure for embossing.

The first plate from which the punchings were taken is used as the backing-up plate for the female section of the die. Both portions were carburized to give the hard surfaces desired to minimize wear.

This rather unusual embossing die has given excellent service, although its cost was extremely low, judging its performance.

Fig. 3 — Operator below is shown finishing welds by grinding

Fig. 4. (Right)—Welding heavy plate to make frame for a power truck. Operator is using electric arc



Overhead Chain Conveyor

West coast enameling plant installs 270-foot continuous trolley conveyor to serve new 3-zone 85-foot enameling furnace, one of the largest installations west of the Mississippi

■ A LEADING producer of porcelain enameled products on the west coast is U. S. Porcelain Enamel Co., 4635 East Fifty-second drive, Los Angeles.

Quite recently this plant installed what is said to be the largest single-flow enameling furnace yet placed in service west of the Mississippi river. Designed and built by Albert J. Boland Co., St. Louis, this furnace utilizes a Link-Belt overhead trolley conveyor for carrying the parts into, through and out of the furnace, the furnace itself being 68 feet long.

Porcelain enameled products made by this company include signs ranging from house numbers and street signs in two colors to extremely large ones with multicolored designs, decorations and even lifelike pictures; also such items as stove parts, refrigerator linings, casings, trimmings, washing machine tubs, coffee urns and a wide variety of other items.

In enameling a stove part, for instance, the stock used is a special enameling iron having an analysis of less than 0.142 per cent impurities. Refining such material on the open hearth takes about twice as long as making most steel. Such sheet is specially heat treated, pickled and inspected besides receiving rigid metallurgical tests in its manufacture. Its point of warpage under heat is much higher. While these features add to cost, they cut finished product losses and so are advantageous.

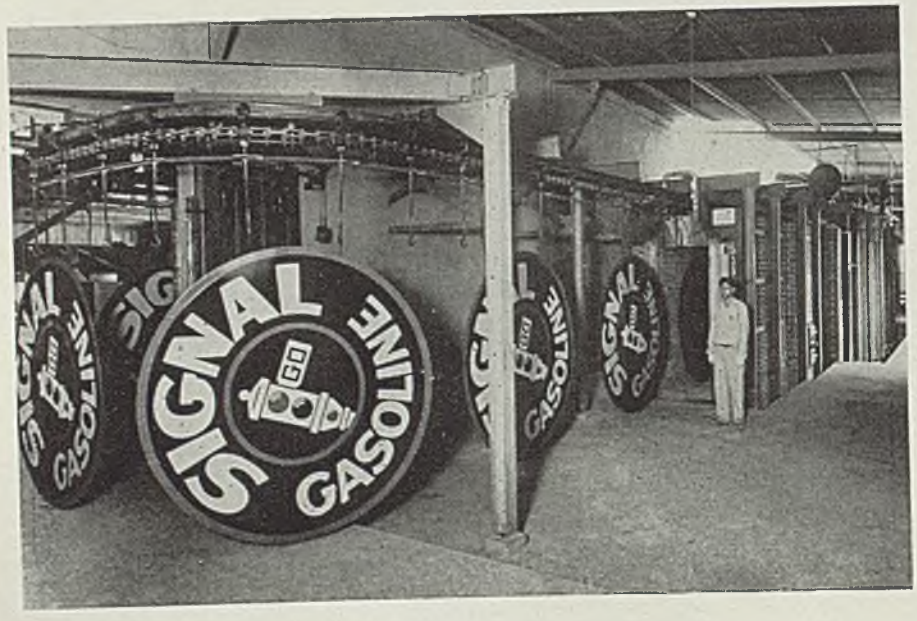
Cutting and bending to shape are done on a 10-foot power shear. Fabricating department is equipped to handle almost any conceivable size or shape other than that requiring die pressing. There are 30-ton and 100-ton punch presses, shears that cut circles up to 72 inches in diameter, a 4-foot roll, electric spot welder and gas welding equipment.

Upon completion of fabrication, units go to pickling room nearby where they are placed in monel metal baskets. These subsequently are picked up by a hoist running on an endless tramrail. This hoist places the baskets in a metal tank, 11 feet long, 43 inches wide and 43 inches deep, in which a heavy-duty commercial detergent removes every vestige of grease. Degreasing solution is kept at boiling point. After a cold water rinse, the basket is placed in a cypress tank of the same size containing a 5 per cent sulfuric acid solution with temperature maintained at from 120 to 130 degrees Fahr.

After a few mintes of pickling in this solution, metal surface is completely cleansed of all dirt and impurities. It is followed by a cold water rinse and hot neutralizing alkaline solution dip. Material then goes to a drier.

A circular drier conveyor also is used in applying the first ground coat enamel to small parts. After dipping in the enamel liquid, parts are hung on the conveyor to drain and are pushed forward a short distance. Excess enamel drains off on a board, leaving an even coat on the work before it passes from the drainboard. After completing the circuit past gas burners, the pieces are dry and ready for firing the first coat.

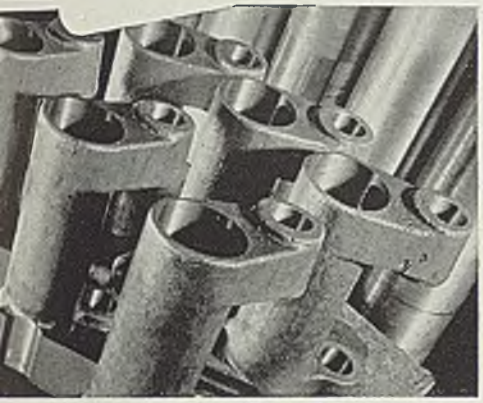
At the same time, larger units are



Single-flow enameling furnace and overhead chain conveyor for handling parts through furnace at U. S. Porcelain Enamel Co., Los Angeles. New automatically controlled 85-foot 3-zone furnace was installed at cost of approximately $60,000

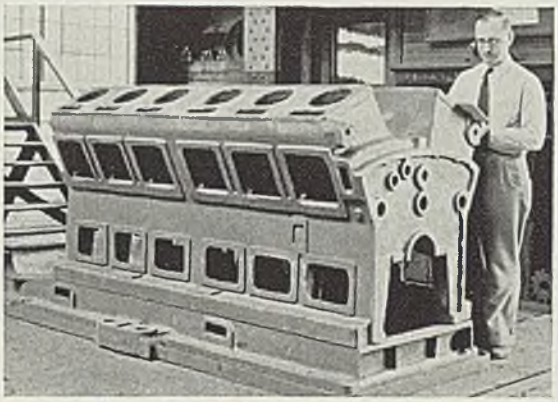
Get these Advantages for Your Product with

STEEL CASTINGS



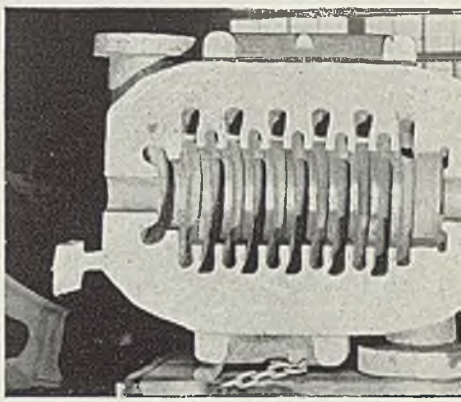
Airplane Landing Gear Parts

SAFETY—Through uniform structure, greater strength—shock and stress resistance.



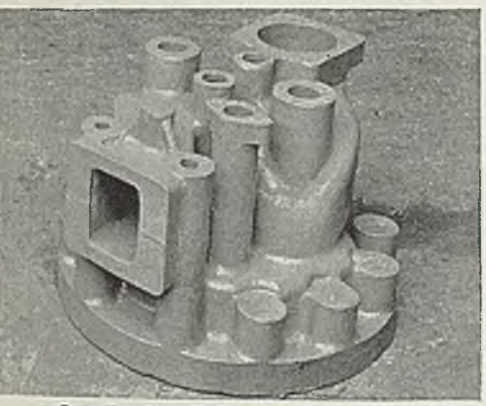
Diesel Engine Frame and Base

SCIENTIFIC WEIGHT DISTRIBUTION—Maximum strength exactly where needed, with minimum weight.



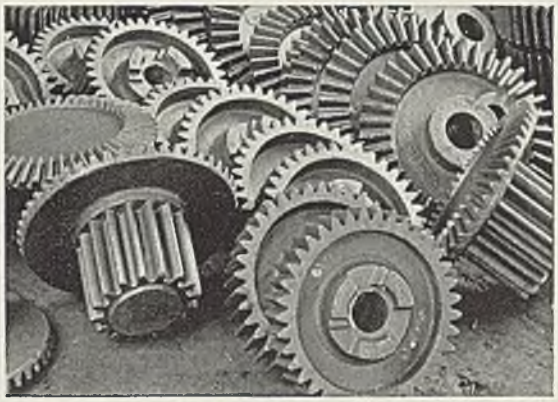
High Pressure Pump Casing

RESISTANCE TO PRESSURE high temperature—wide range of chanical properties available.



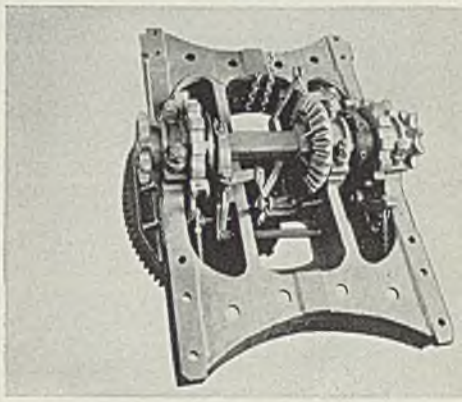
Gas Engine Cylinder Head

LESS MACHINING—Streamlined appearance—lower manufacturing cost.



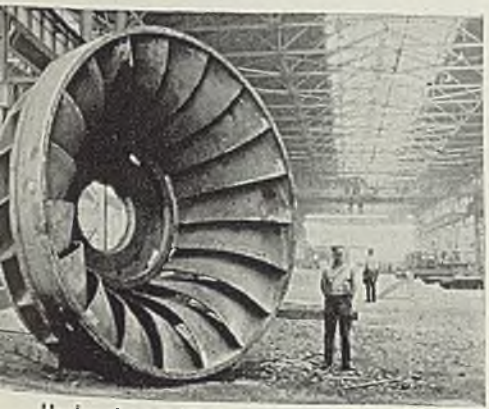
Excavator Gears and Pinions

CAST TO FINAL SHAPE—Little or no excess metal to pay for or trim off.



Power Shovel Truck Frame

HIGH RIGIDITY, minimum de tion under stress, accurate alignm better fit.

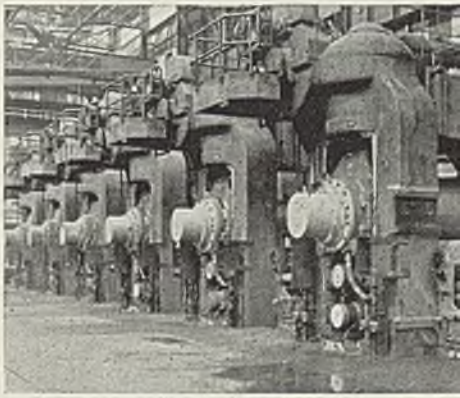


Hydroelectric Turbine Runner

INTRICATE SHAPES cast as units save finishing and assembly time—reduce costs.

Whatever you manufacture, you can improve and modernize your product with Steel Castings, and often reduce substantially your production costs.

Your local foundry will gladly consult with you, or you may write—without obligation, of course—to Steel Founders' Society, 920 Midland Building, Cleveland, Ohio.



Steel Mill Rolls and Housings

RESISTANCE TO SHOCKS stresses. Any desired heat treatn available.

STRENGTH PLUS ECONOMY WITH

STEEL CASTINGS

being dipped into a large tank and sent through a drier while suspended from an overhead chain-type trolley conveyor. Extremely large signs have the ground coat sprayed on in a booth especially adapted for spray equipment.

After ground-coated units are dry, they are placed on hangers of the Link-Belt overhead trolley conveyor which travels slowly through the single-flow continuous enameling furnace. The furnace assures identically perfected enameled parts made at a high rate.

The furnace is over 85 feet long, which compares with 12 feet for the old type oven. It will produce five to six times the volume of work. Main chamber of the continuous furnace is 7 feet high and 32½ inches wide. First 30 feet of travel takes place in the preheat chamber where the temperature gradually rises to nearly 1600 degrees Fahr. In the second or firing chamber, which is 31 feet long, temperature is maintained at 1600 degrees. After leaving the firing chamber, work continues to travel through the furnace in a cooling chamber where the product is gradually brought down to lower temperature. Cooling chamber is 20 feet long.

The preheat and cooling chambers have been found valuable in speeding production and protecting the metal against too fast a change in temperature.

As temperature of firing chamber, 1600 degrees Fahr., is quite high and the metal becomes quite soft, adequate support for the work is most essential. Flat sheets, of course, can be suspended from hooks on the chain but formed and assembled ware of odd shapes must be hung on fixtures carefully designed to avoid distortion.

One period of baking or burning is used for the ground coat. Then furnace temperature is reset for subsequent coats which require a little lower temperature.

Conveyor carrying work through the large continuous furnace is 270 feet in length. The endless conveyor chain of drop-forged steel is suspended from trolleys running on the bottom flange of an I-beam track.

♦

Batch Carburizing

(*Concluded from Page* 74)

fan as shown in Fig. 2. The large fan draws gas down through the work and forces it up along the sides with a swirling motion as shown by arrows in Fig. 2. By locating the thermocouple as shown, heating is controlled by the temperature of the work as gases pass directly from work over the thermocouple before encountering heating surface. This permits fast heating of the charge, yet prevents overshooting of the temperature.

This method thus permits the operator to vary any factor while holding the rest constant. As previously mentioned, he thus is able to make improvements in successive batches of parts until conditions are established that give ideal case structure to the particular work at hand. Once these conditions are known, they then are secured automatically in batch after batch. It is this feature that makes this method especially suitable for high-speed high-production work where high quality is essential. Elimination of rejects means the operation is done at low overall cost, savings up to 80 per cent being recorded.

Control equipment is mounted on a panel which in most instances is wired at the factory and thus ready to operate immediately. Instruments include a recording controller with time clock and other simple accessories. A typical unit is seen in Fig. 1 against the wall in the rear of the room. This equipment eliminates entirely the human element in determining results. This method thus can be relied upon to eliminate rejects and improperly treated parts. All this makes for lower overall carburizing costs.

In addition, a number of other operating refinements have been incorporated in the equipment which facilitate the work. For instance, there is no cover for either basket or trays, thus nothing to fasten together in loading the furnace. Also, the furnace lid is not bolted or fastened down. It simply swings over the furnace, is lowered into place in the sand seal ring where it is turned slightly by means of a bar inserted in a socket to cause the ring to cut deeply into the sand under its own weight, forming a tight seal.

Another convenience is the sampling vent shown at top of the furnace in Fig. 2. When carburizing a new steel or a new part, it is easy to follow the development of the case because samples can be withdrawn through the lid at the sampling vent. In this instance, the parts are hung by wires through the vent, permitting them to be withdrawn as desired. In normal operation, the vent is covered by a cap with a small exhaust port opening near a pilot burner which burns any exhaust gases coming from the furnace.

As the lid swings entirely aside from the furnace, loads can be inserted and removed easily using overhead handling equipment. In fact, parts to be quenched can be taken directly from carburizing heat and placed in the quench tank immediately as though they came from a hardening furnace.

The round shape of the furnace aids in removing either large parts or furnace fixtures loaded with smaller parts for quenching directly from the furnace.

The remarkable speed with which the lid can be opened and closed enables the heat treater to remove and quench parts one at a time, while those awaiting their turn are held in the furnace at full temperature and in the carburizing atmosphere. A folding shield protects the operator against heat yet permits him to look into the hot furnace while placing tongs, hooks, etc., for removal of work.

On the other hand, where slow cooling is desired, the work can be placed in a separate unit equipped with a gas-tight metal hood and insulated throughout. The hood is placed over the work in the basket as soon as the furnace is opened to prevent oxidation while the basket is being placed into the slow-cooling unit nearby. One of these cooling units is shown at right in Fig. 1. During cooling, work is protected from the air by illuminating gas.

♦

Linde Publishes Booklet On Sheet Metal Welding

■ A new 16-page booklet, "Sheet Metal Welding Fundamentals", has been published by The Linde Air Products Co., unit of Union Carbide & Carbon Corp., 30 East Forty-second street, New York. It covers such subjects as design factors; control of expansion and contraction, use of jigs, weldability of the material and welding procedure.

The booklet is aimed at fabricators of light-gage metal sheet or light-wall tubing. It also includes a supplementary outline for teaching welding of sheet metal and tubing.

Recommended as an aid for instructors in welding schools and colleges, the outline contains suggestions for lectures, demonstrations, shop work and study references for 30 lessons.

Pittsburgh Seamless

STEEL MECHANICAL TUBING

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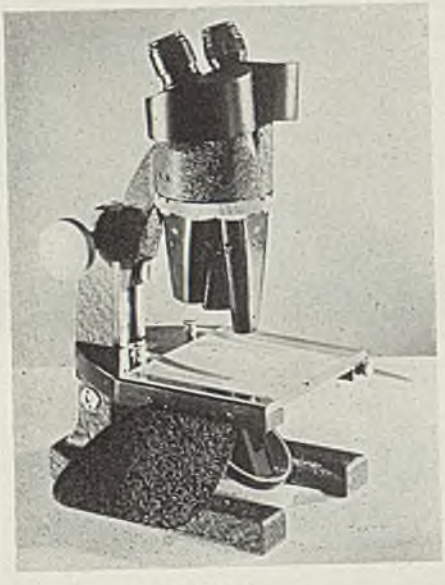
THERE IS NOTHING EQUAL TO SEAMLESS

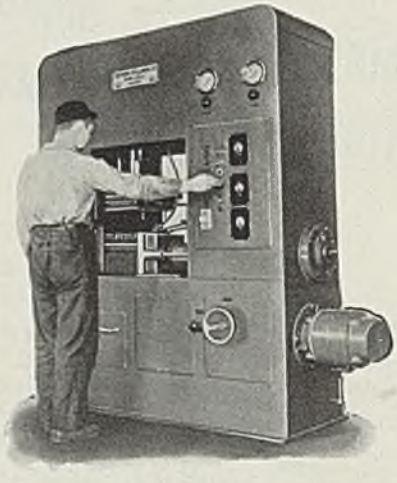
Stereoscopic Microscopes

■ Spencer Lens Co., Scientific Instrument division of American Optical Co., 19 Doat street, Buffalo, has introduced a series of stereoscopic microscopes for detecting fractures in castings and defects in worked metals. Vivid stereoscopic image, a great depth of focus, an exceptionally large object field and a high degree of resolution of fine detail are outstanding characteristics of the instruments. Equally noteworthy are mechanical improvements which facilitate focusing on large or small specimens, and provide for quick changes in magnification. Objective lenses are held in a dustproof revolving objective holder. Base with mirror provides for work requiring transmitted light. Instruments are offered in four mechanical arrangements. Magnifications range from 6.3X to 144X. Seven different powers in paired objectives and four different powers in paired eye-pieces provide 28 different magnifications. Angle between axes of the two elements of the paired objectives is 12 degrees. In the prism boxes, each line of light is bent 2 degrees toward the center so that the convergence at the eye-pieces is but 8 degrees.



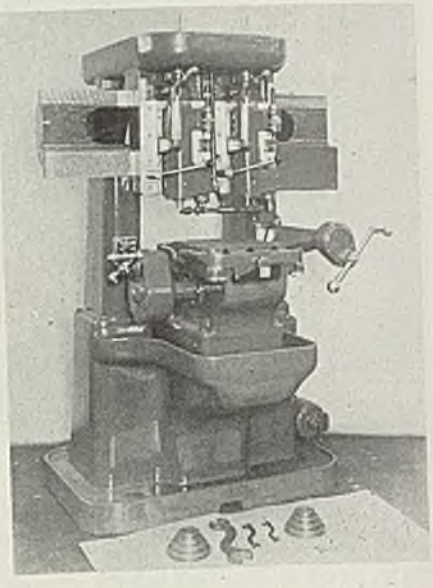
Compression Molder

■ Watson-Stillman Co., Roselie, N. J., has introduced a 50-ton automatic compression molding machine for molding thermosetting materials. It also is adapted to thermoplastics. Machine is self-contained and furnished completely equipped. It consists essentially of one vertical and one horizontal cylinder, a hydraulic power unit and a feed and an ejector mechanism operated automatically and timed to function in proper sequence. All successive operations are controlled automatically, from feeding of loose granular or preformed material into hopper, to final ejection of molded parts and compressed air-cleaning of dies. Control over predetermined quantities of feed, timing, ejection, etc., is safeguarded by special devices.



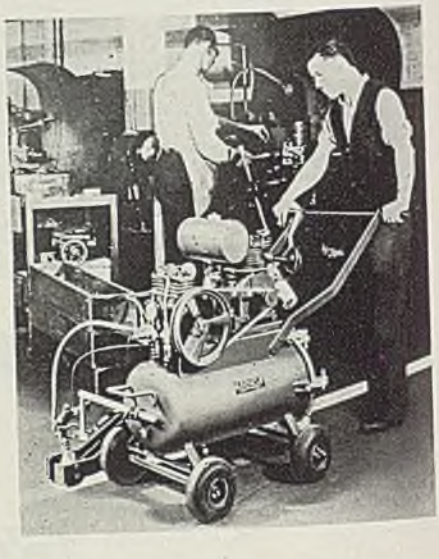
Vertical Profiler And Milling Machine

■ New York Tool Co. Inc., 410 Broome street, New York, has introduced No. 12M high speed vertical profiler and milling machine for manufacturing small parts requiring accurate interchangeability. It is of 2-spindle type driven independently by dynamically balanced vertical motors. Cross rail is designed so slide castings carrying spindles and the motors are in balance. Design of machine allows table to be dropped to increase distance from spindle end to a maximum height of 12 inches. Large levers, convenient to operator for independent vertical movement of spindle slides are counter-balanced by a new type of combined spring suspension and weight concealed in the housing. Positive vertical micrometer adjustable stops also are provided for each spindle, with dials graduated in 0.001-inch. Copying pins are carried in blocks which have a taper attachment, controlled by a screw to simplify the final setting.



Spray Line Marker

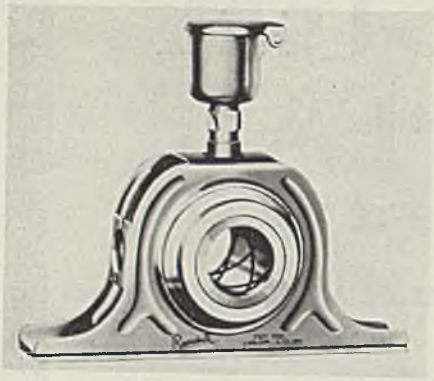
■ Binks Mfg. Co., 3114 Carroll avenue, Chicago, has introduced No. 240 spray line marker for marking of traffic lines for highways, city streets, warehouses, airports, steel mills and other plants. It is operated by one man and will lay down a stripe from 2 to 6 inches in width at the rate of one to four miles per hour. Equipped with a ¾-horsepower gasoline engine and four pneumatic tires, the unit is easy to handle. Operator has a clear view of the old stripe at all times. A 12-



gallon material pressure container keeps the spray gun supplied with material.

Pillow Block

■ Randall Graphite Products Corp., 609 West Lake street, Chicago, announces a larger pillow-block with one-piece housing for shafts of 1 1/16 to 1 5/16-inch diameters. Its features include quiet operation, selective mounting positions, constant self-alignment, self-lubrication and one-third less weight. Entire assembly, consisting of three parts—the



one-piece steel housing, new machine cast iron ball with large oil reservoir and bronze bushing with graphite filled grooves to provide ample lubrication. The assembly is cadmium plated in order to resist corrosion.

Wire Rope Terminals

■ Macwhyte Wire Rope Co., Kenosha, Wis., announces Safe-Lock wire rope terminals available in eye end, fork end, turnbuckle end and stud end types. Terminals are small and compact. Metal in terminal is "married" to wire rope, thus incorporating full strength of the rope.

Units are made in both stainless steel and nickel steel and can be supplied attached to wire ropes of stainless steel and monel metal, as well a any standard steel rope specified by the user.

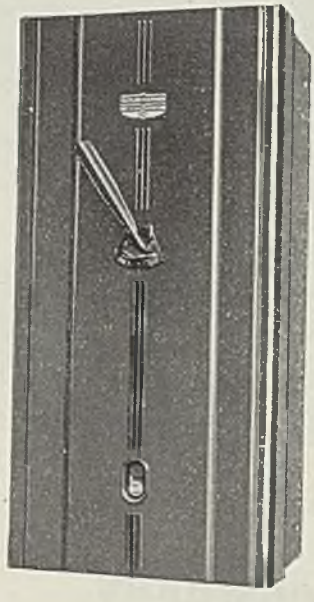
Crane Light

■ Holophane Co. Inc., 342 Madison avenue, New York, announces a crane light made to withstand severe service. Unit, known as Cranelite, is installed under the catwalk and is relamped by raising up a section of catwalk floor. It is fastened to the crane by a 10-inch diameter, ½-inch thick steel plate. Weight of unit is suspended from this plate by 3 compound double acting steel springs so that in case of failure of any or all of the springs, the unit will not fall. Springs absorb shock up and down and in any lateral direction, thereby elim-

inating shock and whip. Units with 1000-watt lamps, spaced on 20-foot centers with height to bottom of crane of 40 feet, will give 20 foot-candles on the floor. The price of the crane unit is $47.50, list.

Combination Starter and Motor Disconnect Switch

■ Cutler-Hammer Inc., 315 North Twelfth street, Milwaukee, announces combination No. 9589 across-the-line starter and motor disconnect switch for use with



squirrel cage and single phase motors.

Front operation allows close ganging of a number of units in compact width and height multiples. All-in-one construction, combining across-the-line starter and motor disconnect switch and fuses in one enclosure, saves wiring and conduit work. Dust Safe vertical contacts which are interchangeable with the across-the-line starter contacts are embodied in the unit, and overload protection is provided by the Eutectic alloy thermal overload relay which permits working the motor up to maximum limit safely. Overload heater coils and operating coils can be interchanged very readily.

Mechanical door interlock prevents opening of door when disconnect switch is closed. Starter is available with either three or four poles in five sizes.

Electrode Tong

■ Morse & Liddell, Oakland, Calif., have introduced an electrode tong, Safe-T-Tong, for arc welding. It enables operator to reach into tight

places with hood up, to change electrodes without danger of shock and to lay the tongs on grounded or hot material with safety. Simple handle switch of the tong makes or breaks the current. Switch is of the indicating type and has positive snap action. It compensates automatically for wear and snuffs the arc if current is broken under load. The tong weighs but 25 ounces in the 300 ampere size.

Oil Immersion Heaters

■ Westinghouse Electric & Mfg. Co., Mansfield, O., has announced an automatic dry-type electric glue pot, featuring a snap action thermostat which maintains a temperature of between 150 and 160 degrees Fahr.

Roughly, only 30 to 50 minutes is required to heat a full two quart container to 150 degrees Fahr. Removable glue container is approximately 7¾ inches in diameter and 9 inches high. Glue pots have a rating of 250 watts and operate at either 115 or 230 volts. Heavy insulation between inner and outer vessel prevents heat loss, and mica insulation protects nickel-chromium heating element from outer wall. Each unit is furnished with 8 feet of heavy rubber insulated electric cord.

< < < HELPFUL LITERATURE > > >

(1)—Extrusion Presses

Beatty Machine & Manufacturing Co.—8 page illustrated folder No. 100HEP. Motor driven hydraulic extrusion presses for welding electrode coating are described. Advantages are given and methods of operation are covered. Interchangeable packing heads, a time-saving feature, are described.

(2)—Air Cylinders and Valves

Hannifin Manufacturing Co.—20 page illustrated bulletin No. 34-S, presents features of double acting, leakproof air cylinders in types and sizes for practically every purpose; "Pack-Less" air control valves in all models; and pressure regulating valves for compressed air and hydraulic service.

(3)—Milling Machines

Cincinnati Milling Machine Co.—28 page illustrated bulletin No. M-868, describing new dial type milling machines built in three sizes and in plain, universal and vertical styles. Quick set-up and ease of operation are features. Specifications and features are covered in detail.

(4)—Metal Gadgets

Townsend Co.—6 page illustrated folder shows 199 actual size special metal gadgets such as screws, nails, bolts, rivets, hooks, and pins of all descriptions. These products are available in any size and any metal for almost any purpose.

(5)—Alloys for Pumps

Ampco Metal, Inc.—Engineering data sheet No. 69 in which selection of alloys for use in pump service where corrosive liquids and abrasive bearing materials are handled, are described. Recommendations of alloys for various parts of pumps in such services are included.

(6)—Insulating Firebrick

Babcock & Wilcox Co.—4 page illustrated bulletin No. R-18, describing the new K-16 insulating firebrick, claimed to have greater stability, unusually light weight, high insulating value and made to withstand temperatures of 1600 degrees F. on direct exposure and 2000 degrees F. for backing up.

(7)—Bending Presses

Cleveland Crane & Engineering Co.—24 page illustrated catalog No. 2002-A covering complete line of "Steelweld" bending presses which produce straight accurate bends and permit performing a great variety of work. Illustrates typical bends and shows how to make them. Presents specifications and operating data.

(8)—Turret Lathe Tools

Gisholt Machine Co.—40 page illustrated catalog No. 1059B, describes entire line of standard tools for ram type turret lathes, including the new multiple cutter turners and slide tools. Information on selection of correct tool for particular work. Tools adaptable to wide range of work and can be used on other makes of turret lathes.

(9)—Leather Packings

E. F. Houghton & Co.—20 page illustrated catalog No. 2-166. "Vim" leather packings for hydraulic and pneumatic use are described. Applications, methods of impregnating and moulding, and a complete price list are given. One section deals with "Twelve Don'ts for Packing Users."

(10)—Magnesite Refractory

Basic Dolomite, Inc.—4 page illustrated bulletin describing "Basifrit," a magnesite refractory for general furnace maintenance and for resurfacing and new construction. Advantages of its use are given. A map showing steel furnaces in which "Basifrit" is used is included.

(11)—Tool Steel Tubing

Bissett Steel Co.—6 page folder stock list of "Bisco" non-shrinking oil hardening tool steel tubing for such applications as blanking dies, punches, collets, collars, rolls, ring gauges, spacers, slitters, and cutting tools. Weight per foot, inside and outside dimensions are listed.

(12)—Blast Furnace Control

Leeds & Northrup Co.—20 page illustrated catalog N-33A-642, showing complete line of temperature measuring and controlling equipment to enable precise application of blast furnace heat. Chart records illustrate efficient operation. Large diagram of typical blast furnace with temperature-detecting points is included.

(13)—Rotary Pumps

Geo. D. Roper Corp.—16 page illustrated catalog No. 939, describing the complete new line of rotary hydraulically balanced pumps with spring loaded packing box, conventional packing box, or mechanical seal, in 8 series for capacities of from 1 to 1000 gallons per minute, in pressures up to 1000 pounds. Selection chart, 21 different drives and mountings, and dimensions are included.

(14)—Board Drop Hammers

Erie Foundry Co.—24 page illustrated bulletin No. 328, showing construction details and specifications of board drop hammers in ratings from 400 to 10,000 pounds. Pictorial trip through Erie's shops shows machining operations.

(15)—Adult Education

International Correspondence Schools—24 page illustrated bulletin No. 7114. Numerous features and articles describe advancement possible through application of adult education. Authors include William S. Knudsen, Harold E. Reed, C. S. Weichel, and others. Personnel problems are discussed.

(16)—Heavy Duty Trucks

Marmon-Herrington Co., Inc.—8 page illustrated bulletin No. 400307, describing the new series DSD heavy-duty, all-wheel-drive trucks that are available in 33 different models with gross capacities up to 70,000 pounds. General description, specifications and a summary of important features are given.

(17)—Grinding and Finishing

Norton Co.—24 page illustrated book No. 1328. Growing use of portable equipment for grinding and finishing metals is discussed and recommendations for various types of work are made. Advantages of various abrasives are covered.

(18)—Process Control Valves

Foxboro Co.—6 page illustrated folder No. DMF 789. "Stabilfio" valves for use in process control are described, including the new guided plunger construction and other improvements. Types of plungers include: wide range V-port, parabolic and wide ratio turned plug. Flow curves are included.

(19)—Hydraulic Torque Unit

Twin Disc Clutch Co.—12 page illustrated bulletin No. 119-A, giving information on the series 11500 hydraulic torque converter for use in connection with prime movers to permit constant speed of engine regardless of speed of driven unit. Specifications and engineering data presented on this fluid drive.

(20)—Crane Lowering Device

Electric Controller & Manufacturing Co.—Illustrated leaflet No. 990, describing a high speed lowering device for increasing light load and empty hook speeds. Can be used with any face-plate or drum-type dynamic lowering controller. Dimensional data, ratings and weights are covered and information on installation and use are included.

(21)—Fire Extinguishers

Pyrene Manufacturing Co.—Illustrated circular No. AD215 tells about classes of property for which 1 and 1½ quart vaporizing liquid type hand pump extinguishers are recommended. Gives construction details of shock absorbing pump mounting of heavy duty type.

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(Continued)

(22)—Needle Bearings

Torrington Co.—26 page illustrated spiral bound bulletin No. 1159, presenting application data on needle bearings for automotive, aircraft, power transmission, production tools, textile machinery and miscellaneous industrial uses. Includes bearing selection and installation information.

(23)—Metal Cleaners

Cowles Detergent Co.—12 page illustrated booklet, giving information on and applications of line of cleaners for castings, steel, brass, die castings, and aluminum; stripping lacquers, enamels and paints from steel and rubber molds; emulsifying and wetting agents for degreasing; and special cleaners.

(24)—Roller Bearings

Dodge Manufacturing Corp.—20 page illustrated bulletin No. A-325. Newly announced Dodge-Timken double interlock roller bearings covering the entire range of industrial bearing requirements are described. Designed for 30,000 hour service. A unique cut-away view of an expansion type bearing is shown. Selection tables are included.

(25)—Alloy Tubes

Babcock & Wilcox Tube Co.—Technical bulletin No. 12-A includes condensed technical data on high tempering steels, including revised useful information on B & W seamless alloy tubes and pipe for high pressure and high temperature service. Characteristics and engineering curves are included.

(26)—Soldering Fluxes

American Chemical Paint Co.—4 page bulletin No. 5, describing "Fiosol" soldering fluxes, available in liquid, paste or cream form. They are claimed to clean and flux in a single operation and to wet oily surfaces. Other products made by this company are also described briefly.

(27)—Safety Goggles

American Optical Co.—Illustrated bulletin describing the proper care and use of goggles, including methods of sterilizing to avoid face and eye infection. Methods of adjustment to avoid discomfort and "loopholes" which may lead to injury are also covered.

(28)—Metal Stamping

Lansing Stamping Co.—Portfolio of eight illustrations showing facilities for handling metal stamping. Examples of small and large stampings handled are illustrated. Spot welding, enameling and tapping are also covered.

(29)—Miller and Die Sinker

Reed-Prentice Corp.—6 page illustrated circular No. 18-301-9, describing the No. 3V vertical milling and die sinking machine. Shows details of parts and gives specifications of this precision machine tool.

(30)—Hobs-Tools-Reamers

Barber-Colman Co.—264 page illustrated pocket-size catalog "K" describing hobs, milling cutters and flat turning tools, reamers and machine tools. A full explanation of spline shaft hobs and their uses, including the recently developed elongated tooth hob and taper spline hob, is given. Engineering tables and an improved tooth form are included.

(31)—Heavy Duty Carburizer

Hevi Duty Electric Co.—20 page illustrated bulletin No. HD-937, describing the "Carbonol" process for carburizing steels in the "Hevi Duty Carburizer." Complete specifications of carburizing equipment. Penetration rate is shown and results of process are given. Cost comparisons of this electric-gas furnace method with other methods are presented.

(32)—Fans and Blowers

Hartzell Propeller Fan Co.—32 page illustrated catalog No. 12, describing entire line of propeller-type fan and blowers. Contains air-delivery tables on each type. New models shown include the "Tear-Drop" propeller line, and fans and blowers with motors entirely out of air stream.

(33)—Stock Tools

Weldon Tool Co.—80 page illustrated case-bound catalog No. 8, describing and giving prices of a wide range of milling tools and tool holders. A second section of the catalog covers a wide selection of special tools for cutting. Engineering tables are also given.

(34)—Fire Clay

Inland Fire Brick Co.—4 page illustrated folder No. C-3, describing Inland Blue fire clay for use in steel ladles and gray iron and malleable cupolas. Analysis and fusion of this clay are covered. Other clays for foundry and metal melting practice are also described.

(35)—All-Iron Gate Valves

Bartlett Hayward Div., Koppers Co.—4 page illustrated bulletin No. 808. Low-pressure all-iron gate valves for water gas, coke oven, chemical and power plants and other industrial applications are covered. A table giving specifications of valves from four to 48 inches in size is included.

(36)—Steel

Republic Steel Corp.—40 page illustrated catalog No. 353. Republic double strength steel, a high tensile, low alloy product, is described. Methods of fabrication, resistance to corrosion and fatigue, welding and cutting, machining, forms available and pictures of numerous typical applications are covered.

(37)—Hydraulic Presses

A. B. Farquhar Co., Ltd.—24 page illustrated loose-leaf type catalog describing hydraulic production presses from 75 to 4000 tons capacity. Specifications are given. Crimping, scarfing, flanging, joggling, laboratory, embossing, straightening, stamping, forming and molding presses are described.

(38)—Heating System

Lee Engineering Co.—16 page illustrated bulletin describing the Lee direct warm air heating system, combining heating and ventilating, for all types of industrial plants. Case studies show advantages of this system. A list of installations is given.

(39)—Flame Descaling

Air Reduction Sales Co.—6 page illustrated folder No. ADG-1068. The "Airco Flame-Descaling Process" for use in steel mills, forge shops and foundries is described. Light weight portable equipment is used. Advantages and methods of use are covered.

(40)—Lubricating Bushings

Moccasin Bushing Co.—47-page illustrated catalog describing self-lubricating oil-distributing bushings that have in-built wooden feeders that maintain lubrication by capillary attraction. Design, manufacture and typical uses are described. Engineering tables complete the book.

(41)—Flange-Jacks

Garlock Packing Co.—4 page illustrated bulletin No. 129, presenting and describing a new tool for replacing gaskets in flanged pipe lines. Speed, safety and economy are claims made for it. Method of operation and prices are given.

(42)—Engine-Driven Welder

Lincoln Electric Co.—4 page illustrated bulletin No. 336, describing engine-driven "Shield-Arc Junior" welder, with a current range of 40 to 250 amperes. Gives specifications and applications of this unit in stationary and portable types.

(43)—Flexible Couplings

Lord Manufacturing Co.—4 page illustrated bulletin No. 200. Bonded rubber, fractional horsepower flexible couplings are described. Advantages, features, specifications and dimensions are given. Other bonded rubber products are also shown.

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Smashes Traditions

(*Concluded from Page 50*)

ing belt forward and reverse mechanism.

In contrast to this consider Fig. 2, which shows a recent model of the Gray openside planer with variable voltage drive which has eliminated the noisy and troublesome belts, which gives fingertip control at the strategic operating position and over an infinite range of speeds and feeds, and which gives maximum production because of the tremendous cutting power and quick return which this drive makes possible.

As an example of complete electrification with motors and control apparatus actually built into the machine—which is a growing trend—consider the Brown & Sharpe electric milling machine depicted by Figs. 3 and 4. Driving power of this machine is subdivided electrically. That is, individual built-in motors are provided for spindle, table and coolant pump. The table and spindle motors, which must start and stop frequently, are stopped by the dynamic braking system known as "plugging." They are electrically reversed and suddenly brought to rest by the reverse torque thus developed—being electrically disconnected at almost the exact instant of zero revolution.

Climb milling is made possible on this machine by means of a backlash takeup device on the table feed screw. This is released automatically by a solenoid device at the instant that the table rapid traverse is engaged.

The manner in which relays, contactors and other electrical control apparatus has been concentrated and neatly hidden within the hollow column of this machine is clearly indicated by Fig. 4 which shows this "control column" with its covers removed. Much of the apparatus within this column was not available to machinery builders a few years ago. This apparatus not only is extraordinarily compact, but is long lived, thoroughly dependable and instantaneous in action. Without it modern achievements in machine tool electrification would not be possible.

♦

Device Computes Sales

■ Eddy-Rucker-Nickels Co., Cambridge, Mass., announces a vest-pocket Profit-O-Meter designed as an aid in stabilizing prices. Working on the sliding rule principle, it shows at a glance, without computation, the added dollar or unit sales necessary to offset a given price-cut and maintain dollar profits.

Inasmuch as sales increases required vary, both with the amount of the price-cut and the original gross profit margin, the device shows instantly the effect of both variables in one figure.

Analyses of Flame-Hardenable Cast Irons

Tool Carbon	Combined Carbon	Silicon	Manganese	Phosphorus	Sulphur	Nickel	Chromium	Molybdenum
3.44	0.87	1.35	0.70	0.116	0.094	....	.....	....
3.44	0.69	1.51	0.87	0.194	0.087	....	.....	....
2.97	0.66	1.62	0.78	.....	.....	nil	0.045	....
3.14	0.80	1.60	0.80	.....	.....	....	.....	....
3.15	0.70	2.00	0.90	.....	.....	1.37	.....	....
3.19	0.84	1.22	....	.....	.....	1.11	0.10	0.76
2.87	0.84	1.87	....	.....	.....	0.18	0.21	....
3.22	0.65	1.75	0.75	0.212	0.089	....	.....	0.47
				Pearlitic Malleable Iron				
2.11	0.41	1.00	....	0.125	0.108	....	.....	....
2.10	0.35	1.07	....	0.122	0.100	....	.....	....

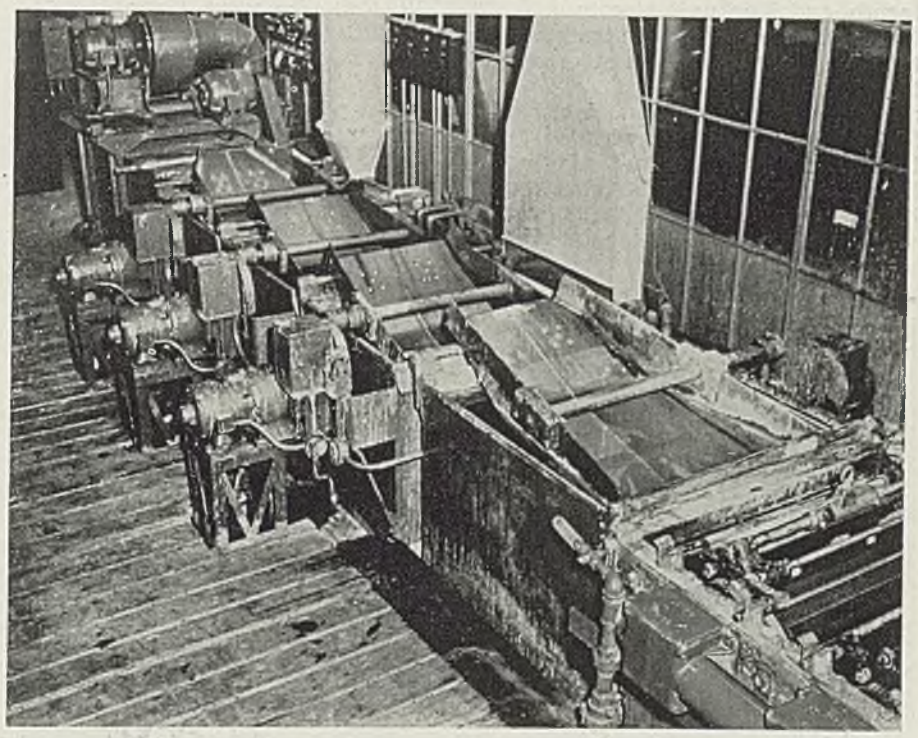
■ **Omitted inadvertently from the article, "Flame Hardening Cast Iron," STEEL, May 6, p. 46, the accompanying table is the tabulation to which reference was made. It lists some of the many known cast irons that can be flame hardened successfully. Under no circumstances is it to be considered as a complete list, for other combinations have been treated with good results and probably many more are suitable for the process**

U. S. Navy Standardizes Aircraft Pump Tests

■ To provide standardized testing in overhauling aircraft pump equipment at its score of air bases and its aircraft carriers, United States navy has ordered from Pump Engineering Service, Cleveland, an instrument panel and steel bench on which are mounted the six or seven necessary instruments for conducting complete tests.

Panel will test fuel, oil and vacuum pumps. Oil pumps are tested for calibration for capacity, relief valves for balance and regulation. About 25 panels will be built.

Cleaning and Plating Small Parts



■ **A variety of small parts, too difficult to clean by dipping basket method, are cleaned in the illustrated hopper type barrel plating machine installed recently at the Chrysler-Plymouth plant in Detroit by Hanson-Van Winkle-Munning Co., Matawan, N. J. Parts are run through a cleaning cycle, from hopper to hopper, and finally plated in the same series. Production through these hoppers, provided they are loaded continuously, is one hopper load into the dryer every 110 seconds. Plating cylinders take from 75 to 200 pounds at a time, depending upon size and shape of parts**

Follansbee Reorganization Plan Completed: To Spend $1,270,000

■ JUDGE Robert M. Gibson in the United States district court at Pittsburgh last week signed an order directing final consummation and providing for procedure in carrying out the Follansbee Bros. Co. reorganization plan.

Order gave effect to the company's plan approved by the court Jan. 6 and directed the trustees to transfer all assets of Follansbee Bros. Co. to Follansbee Steel Corp., the successor company.

The company will spend about $1,270,000 for new equipment at its Follansbee, W. Va., plant, where modern cold-reducing mills and necessary auxiliary equipment will be installed. This plant modernization, a vital part of the reorganization, will place the company in a competitive position on cold reduced products. It also will enhance the company's specialties. Open-hearth furnaces at its Toronto, O., plant will continue to be operated.

John Follansbee, board chairman, announced new equipment will be ready for operation by early fall. Company's principal product will continue to be tin plate, electrical steel sheets, black sheets and metal roofing.

Aviation Partsmaker Builds New Plant

■ Modern machine shop for the N. A. Woodworth Co., aviation parts manufacturer, at 1501 Jarvis avenue, Ferndale, Mich., is being built by the Austin Co. of Cleveland.

More efficient layout in this modern plant is said to make possible reduction of company's investment in capital equipment.

The development will represent a total expenditure of about $50,000, and is scheduled for completion in three weeks. Building will have a 40-foot monitor aisle and two 30-foot side aisles, with overall area of 10,000 square feet.

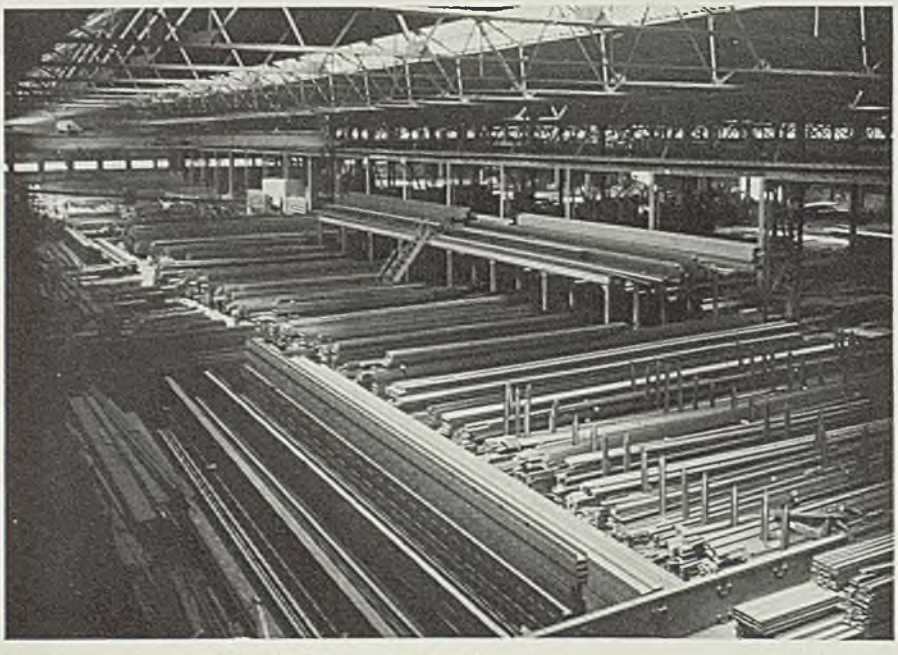
4000 Inspect Ryerson's Warehouse

■ "OPEN WAREHOUSE" party held by Joseph T. Ryerson & Son Inc., Chicago, Saturday, May 11, attracted a crowd of more than 4000 manufacturers, steel men, customers and other guests to the company's Chicago warehouse, Sixteenth and Rockwell streets.

The Chicago warehouse is claimed to be the world's largest steel service plant, both from a floor space and a tonnage standpoint. Between 50,000 and 70,000 tons of steel are in stock. Guests, many of them brought from the loop by chartered buses, were conducted to the top floor of the main office building, and from there through the offices and out into the various plant buildings and shops to view the large stocks and many new facilities. Experienced guides met guests at various points en route to explain the functions of each department.

Visitors also were given the opportunity to meet and talk with company executives and other members of the organization. Doors were opened at 11 a. m., with the open house continuing till 4 p. m. Buffet lunches and refreshments were served.

Shown below is one of the warehouse bays, where structural shapes are stored.



Discuss Castings

(*Concluded from Page* 54)

ever since it was organized in 1888, the essence of it consisting of the well-known three H's—the hand, the head and the heart.

By the term "hand" is meant physical movements of all parts of the body necessary for doing a job. The term "head" covers the student's mental ability and training he receives in classrooms and shops. The "heart" phase deals with the young man's enthusiasm.

The Newport News training program is built around Richards' formula which states that effective training (E) is the result of the proper combination of the five requirements of a good mechanic-manipulative skill (M), technical knowledge (T), auxiliary information (I), trade judgment (J) and craft morale (Mo). These elements do not carry equal weight and in the final formula are arranged as follows:

$$E = 4M + T + 2I + J + 2Mo$$

Inasmuch as each apprentice represents a considerable financial investment, great care is exercised in selecting candidates, Mr. Wornom noted.

An interesting slant on apprentice training was presented by a graduate apprentice himself, C. W. Wade, Caterpillar Tractor Co., Peoria, Ill.

Mr. Wade, in company with 11 other boys, began a three-year apprentice program in foundry work in 1934. No full-time instructors were provided at that time to supervise the training program which was left largely to plant foremen. This did not work out so well, as the foremen did not place the boys on enough different jobs to acquaint them fully with plant operations. Hence the system was changed to a four-year course in 1935 and a full-time instructor hired who corrected defects in the old system and developed new technique. The plant now has 24 indentured apprentices in the foundry, receiving individual instruction in both classroom and shop. Three supervisory men are provided, working in co-operation with foremen. The young men spend time in each division of the foundry, according to the production sequence.

Output Rises Further; Demand Tending Upward

European developments seen additional stimulus to foreign buying. Building activity expands. Scrap up sharply

MARKET IN TABLOID ★

Demand
Slightly heavier; sheet and strip releases expand.

Prices
Most products steadier; scrap quotations higher.

Production
Up 3 points to 66½ per cent.

■ LATEST European developments appear likely to intensify foreign demand for steel and munitions in this country.

While United States exports to the Netherlands and Belgium will be affected adversely, spreading of the war will not only cripple steel markets recently served by the latter but also will expand the Allies' requirements of material and equipment.

Belgium and the Netherlands had increased sharply their imports of iron and steel from the United States this year. First quarter receipts totaled 62,755 tons, compared with 129,364 tons in all of 1939. Imports here from those countries were only 1473 tons the first three months of 1940, while 88,909 tons was received in all of last year.

Business in domestic steel markets continues to improve moderately, with ingot production up 3 points to 66½ per cent in the sharpest rise so far this year. A further increase is indicated for the coming week. Since buyers already have fairly large inventories and unchanged prices are in immediate prospect, there is less occasion than prevailed last September for future coverage in anticipation of effects of the European situation. Nevertheless, it seems probable that stocks will not be permitted to decline as far as might have occurred had the foreign stalemate continued.

Heavier demand for sheets and strip and small gains, principally seasonal, in sales of other products furnish most of the impetus to the upturn in steelmaking. Output last week was nearly 20 points above the rate a year ago, when operations were at practically the 1939 low but were preparing to start a sustained advance which moved above 90 per cent during the war-inspired fourth quarter boom.

Scrap prices are rising more rapidly, although latest strengthening is not attributable directly to war influences. Higher quotations at Pittsburgh and Chicago advanced the scrap composite 75 cents last week to $16.83, highest since early February.

Attempts of mills to complete shipments by June 30 of all flat-rolled steel business taken at cut prices are quickening production but will result in lessened activity next quarter, unless heavier demand for other products is forthcoming the next seven weeks.

Another adverse factor in the third quarter outlook is the prospective letdown in automotive needs during that period. Motor car assemblies still are relatively active, the recent decline being more gradual than was expected. Last week's output of 98,480 units was a decrease of 825 but compares with 72,375 units a year ago.

Building construction is more active, some districts noting a sharp upturn in private work recently. Most of such jobs are small, although last week's structural shape awards included five large lots, totaling 17,785 tons, which brought aggregate bookings to the highest level in many weeks. Outstanding orders included 7500 tons for the Rainbow bridge, Niagara Falls, 6000 tons for a Syracuse, N. Y., grade crossing, 1750 tons for a New York viaduct, 1400 tons for a hangar, La-Guardia field, New York, and 1135 tons for blast furnace rebuilding, Youngstown, O.

Rumors of increased buying of railroad equipment have yet to materialize and backlogs of freight car builders and material suppliers continue to decline. Six small orders were reported last week for 446 cars. April freight car orders involved 2077 units, compared with 3014 in March and 3095 a year ago. Awards the first four months totaled 6688 cars, against 6157 a year ago, 829 in the 1938 period and 40,705 in 1937.

Finished steel prices generally are steadier. Sheet and strip quotations, including galvanized material, have moved back to levels originally announced for this quarter. Some shading continues in certain secondary markets.

Except for a 6-point drop to 88 per cent at Wheeling, most districts recorded higher steelmaking rates last week. Gains included 3½ points to 61½ per cent at Pittsburgh, 6 points to 65½ at Chicago, 14 points to 58 at Buffalo, 3 points to 53 at Youngstown, 2½ points to 45 at St. Louis, 1 point to 71 at Cleveland and 8 points to 61 at Cincinnati. Unchanged were eastern Pennsylvania at 57, New England at 53, Birmingham at 83 and Detroit at 70.

COMPOSITE MARKET AVERAGES

	May 11	May 4	Apr. 27	One Month Ago Apr., 1940	Three Months Ago Feb., 1940	One Year Ago May, 1939	Five Years Ago May, 1935
Iron and Steel	$37.25	$37.17	$36.57	$36.69	$37.21	$35.80	$32.35
Finished Steel	56.60	56.60	55.50	55.90	56.50	56.00	54.00
Steelworks Scrap..	16.83	16.08	16.00	16.00	16.98	14.05	10.27

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	May 11, 1940	April 1940	Feb. 1940	May 1939
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.20c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.52
Iron bars, Chicago	2.25	2.25	2.30	2.10
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.00	2.10	2.05
Sheets, cold-rolled, Pittsburgh	3.05	2.95	3.05	3.10
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	1.95	2.10	2.03
Sheets, cold-rolled, Gary	3.05	2.90	3.05	3.08
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to ⅜-inch, Pitts.	2.00	2.00	2.00	1.92

Pig Iron

	May 11, 1940	April 1940	Feb. 1940	May 1939
Bessemer, del. Pittsburgh	$24.34	$24.34	$24.34	$22.34
Basic, Valley	22.50	22.50	22.50	20.50
Basic, eastern, del. Philadelphia	24.34	24.34	24.34	22.34
No. 2 foundry, Pittsburgh	24.21	24.21	24.21	22.21
No. 2 foundry, Chicago	23.00	23.00	23.00	21.00
Southern No. 2, Birmingham	19.38	19.38	19.38	17.38
Southern No. 2, del. Cincinnati	22.89	22.89	22.89	20.89
No. 2X, del. Phila. (differ av.)	25.215	25.215	25.215	23.215
Malleable, Valley	23.00	23.00	23.00	21.00
Malleable, Chicago	23.00	23.00	23.00	21.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.34	28.34
Gray forge, del. Pittsburgh	23.17	23.17	23.17	21.17
Ferromanganese, del. Pittsburgh	105.33	105.33	105.33	85.33

Scrap

Heavy melt. steel, Pitts.	$17.75	$16.45	$17.75	$14.55
Heavy melt. steel No. 2, E. Pa.	15.50	15.50	16.30	12.75
Heavy melting steel, Chicago	16.25	15.20	15.75	12.75
Rails for rolling, Chicago	19.25	18.65	18.25	17.25
Railroad steel specialties, Chicago	19.00	18.05	18.50	14.75

Coke

Connellsville, furnace, ovens	$4.75	$ 4.75	$ 4.75	$ 3.75
Connellsville, foundry, ovens	5.75	5.75	5.75	5.00
Chicago, by-product fdry., del.	11.25	11.25	11.25	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheet Steel

Hot Rolled

Pittsburgh	2.10c
Chicago, Gary	2.10c
Cleveland	2.10c
Detroit, del.	2.20c
Buffalo	2.10c
Sparrows Point, Md.	2.10c
New York, del.	2.34c
Philadelphia, del.	2.27c
Granite City, Ill.	2.20c
Middletown, O.	2.10c
Youngstown, O.	2.10c
Birmingham	2.10c
Pacific Coast ports	2.65c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast ports	3.70c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast ports	4.05c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.55c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.40c	4.00c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.46c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.10c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast ports	2.65c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	4.00c

Structural Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast ports	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 20 tons or over)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast ports	2.80c

Rail Steel

(Base, 5 tons or over)

Pittsburgh	2.05c
Chicago or Gary	2.05c
Detroit, delivered	2.15c
Cleveland	2.05c

Buffalo	2.05c
Birmingham	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.70c

Iron

Chicago	2.25c
Philadelphia, del.	2.37c
Pittsburgh, refined	3.50-8.00c
Terre Haute, Ind.	2.15c

Reinforcing

New Billet Bars, Base

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	1.60-1.90c
Gulf ports	1.95-2.25c
Pacific Coast ports	2.00-2.30c

Rail Steel Bars, Base

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.60-1.90c
Gulf ports	1.95-2.25c
Pacific Coast ports	2.00-2.30c

The above represent average going prices. Last quotations announced by producers were 2.15c, mill base, for billet bars and 2.00c for rail steel.

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails	$2.55

(Per pound)

Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c
Woven wire fencing (base C. L. column)	67
Single loop bale tie (base C.L. column)	56
Galv. barbed wire, 80-rod spools, base column	70
Twisted barbless wire, column	70

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh, keg..$3.85

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast ports	2.75c
Cooperage hoop, Young., Pitts.; Chicago, Birm.	2.20c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.60c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Plow bolts	68.5 off

Nuts

	U.S.S.	S.A.E.
Semifinished hex. ½-inch and less	67	70
⅝-1-inch	64	65
1⅛-1½-inch	62	62
1⅝ and larger	60	..

Hexagon Cap Screws

Upset, 1-in., smaller	70.0 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.85c
Pacific Coast ports	2.95c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.

Structural	3.40c
⅞-inch and under	65-10 off

Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½

Iron

¼	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¼ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

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

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½"O.D.	13	$ 9.72	$23.71
1¾"O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼"O.D.	13	13.79	21.68
2¼"O.D.	12	15.16	....
2½"O.D.	12	16.58	26.57
2¾"O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½"O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼"O.D.	13	9.26	10.67
1½"O.D.	13	10.23	11.79
1¾"O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼"O.D.	13	14.54	16.76
2¼"O.D.	12	16.01	18.45
2½"O.D.	12	17.54	20.21
2¾"O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½"O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½"O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅝-inch incl. (per 100 lbs.)	$2.00
Do., over ⅝ to 41/64-in. incl.	2.15

Worcester up $0.10; Galveston up $0.25; Pacific Coast up $0.50.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.35- 4.60
Connellsville, fdry.	5.00- 5.75
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.25- 6.50
Wise county fdry	5.50- 6.50
Wise county fur.	5.00- 5.25

By-Product Foundry

Newark, N. J., del.	11.38-11.85
Chicago, outside del.	10.50
Chicago, delivered	11.25
Terre Haute, del.	10.75
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	10.75
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	25.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	7.00c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

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 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.‡	19.38	.....	18.38	24.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.00	23.50	.....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	.....
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	21.00	.....	.....	.....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	.....	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	25.31	25.31	24.81	25.81

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	.....
St. Louis from Birmingham	†23.12	.....	22.62	.....
St. Paul from Duluth	25.63	25.63	.....	26.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $28.50, base; $29.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$22.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

†Silvery

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

Bessemer Ferrosilicon†

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

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

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

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Domestic dead - burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

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

Chrome brick	$50.00
Chem. bonded chrome	50.00
Magnesite brick	72.00
Chem. bonded magnesite	61.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$25.00-$26.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail.	22.00
Do. barge	22.00
No. 2 lump	22.00

Ferroalloy Prices

Ferromanganese, 78-82%, lump and bulk, carlots tide., duty pd. $100.00
Ton lots 110.00
Less ton lots 113.50
Less 200 lb. lots 118.00
Do., carlots del. Pitts. 105.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 32.00
Do., 26-28% 39.50

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 82.00
Do., 75 per cent 126.00
Do. ton lots 142.00
Spot, $5 a ton higher.

Silicomanganese, c.l., 2½ per cent carbon. 103.00
2% carbon, 108.00; 1%, 118.00
Contract ton price $12.50 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.90-2.00

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del carlots 11.00c
Do., ton lots 11.75c
Do., less-ton lots 12.00c

67-72% low carbon:

	Carloads	Ton lots	Less ton
2% carb.	17.50c	18.25c	18.75c
1% carb.	18.50c	19.25c	19.75c
0.10% carb.	20.50c	21.25c	21.75c
0.20% carb.	19.50c	20.25c	20.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots 1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do. less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls 2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton 142.50
Do., spot 145.00
Do., contract, ton lots 145.00
Do., spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 137.50
Do., spot 160.00
Do., contract, ton lots 160.00
Do., spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk 7.00c
Do., ton lots 7.50c
Do., less-ton lots 7.75c
Do., less 200 lbs. 8.00c
Spot, ¼c higher.

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.50
Do., smaller lots 2.60

Vanadium Pentoxide, contract, lb. contained $1.10
Do. spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 84.00c
Do., spot 89.00c
88% chrome, contract 83.00c
Do., spot 88.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads, bulk, freight allowed, ton $69.50
Ton lots 79.50
Less-ton lots, lb. 3.75c
Less 200 lb. lots, lb. 4.00c
Spot ¼-cent higher.

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton $97.50
Do. spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do. ton lots 15.00c
Do. less-ton lots 16.00c
Spot ½c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do. 100-200 lb. lots 2.75
Do. under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.66	3.46	4.13	8.63	7.23
New York Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.05	3.31	4.09	8.59	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.50	3.31	4.06	8.56	7.16
Baltimore	3.95	4.05	4.45	3.70	3.70	5.25	3.55	....	5.05	....	4.05	....	....
Norfolk, Va.	4.15	4.25	....	3.90	3.90	5.45	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.45	3.22	3.75	8.15	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	....	4.75	....	3.65	8.15	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.72	3.20	3.75	8.15	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.23	4.30	4.84	3.20	3.80	8.45	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	....	5.00	....	4.42	....	....
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.45	4.00	8.50	7.10
Chicago	3.50	3.40	3.40	3.55	3.55	5.15	3.05	4.10	4.60	3.30	3.75	8.15	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.63	4.34	8.84	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90		5.00		4.30		
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	....	4.76	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.75	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.33	4.33	5.93	3.99	....	5.71	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.88	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....		....	....
Seattle	4.00	3.85	5.20	3.40	3.50	5.75	3.70	6.50	4.75	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75		
Los Angeles	4.15	4.40	6.25	4.00	4.00	6.40	4.10	6.30	5.25	....	6.60	10.65	9.80
San Francisco	3.50	4.00	6.00	3.35	3.35	5.60	3.40	6.40	5.15	....	6.80	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.10	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.20	5.75	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.48	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 300-4999 in San Francisco, Portland; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, 1500-3499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle, San Francisco; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 10 to 49 bundles in Philadelphia.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, May 9

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$20.16 6 0 0	$33.23	3 18 0
Basic bessemer	....	.....	.....
Hematite, Phos. .03-.05	21 00 6 5 0	.....	.....
Billets	....	$31.95	3 15 0
Wire rods, No. 5 gage	....	60.71	7 2 6
Standard rails	$35.28 10 10 0	$48.99	5 15 0
Merchant bars	2.02c 13 9 0	2.77c	7 6 0
Structural shapes	1.82c 12 2 6	2.83c	7 9 0
Plates, ¼ in. or 5 mm.	1.93c 12 17 6	3.53c	9 6 0
Sheets, black, 24 gage or 0.5 mm	2.55c 17 0 0	2.98c	7 17 0*
Sheets, gal., 24 ga., corr.	3.05c 20 6 3	3.94c	10 7 6
Bands and strips	....	2.76c	7 5 0
Plain wire, base	....	3.15c	8 6 3
Galvanized wire, base	....	3.75c	9 17 6
Wire nails, base	....	3.56c	9 7 6
Tin plate, box 108 lbs.	$ 5.38 1 12 0	.....	.....

British ferromanganese $100.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich ‡‡Mar
Fdy. pig iron, Si. 2.5.	$18.65	5 11 0(a)	$14.97	788	$31.44	950	$25.33	63
Basic bess. pig iron	17.56	5 4 6(a)	.....	29.79		900	27.94	(b)69.50
Furnace coke	5.32	1 11 8	4.28	225	10.92	330	7.64	19
Billets	31.50	9 7 6	22.10	1.163	42.20	1.275	38.79	90.50
Standard rails	1.67c	11 3 0	1.43c	1,588	2.06c	1,375	2.38c	132
Merchant bars	2.10c	14 0 0††	1.31c	1,454	2.06c	1,375	1.98c	110
Structural shapes	1.86c	12 8 0††	1.27c	1,414	2.06c	1,375	1.93c	107
Plates, †¼-in. or 5 mm	1.88c	12 10 6††	1.66c	1,848	2.42c	1,610	2.29c	127
Sheets, black	2.63c	17 10 0§	1.97c	2,193‡	2.85c	1,900‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.11c	20 16 3††	3.23c	3,589	4.80c	3,200	6.66c	370
Plain wire	2.93c	19 10 0	2.11c	2,340	3.00c	2,000	3.11c	173
Bands and strips	2.22c	14 15 0††	1.47c	1,632	2.48c	1,650	2.29c	127

†British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. §§Last prices, no current quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	15.00
Bos. dock No. 1 exp.	15.00
New Eng. del. No. 1	14.00
Buffalo, No. 1	16.50-17.00
Buffalo, No. 2	14.50-15.00
Chicago, No. 1	16.00-16.50
Chicago, auto, no alloy	15.00-15.50
Cincinnati, dealers	13.00-13.50
Cleveland, No. 1	16.50-17.00
Cleveland, No. 2	15.50-16.00
Detroit, No. 1	†13.75-14.25
Detroit, No. 2	†12.50-13.00
Eastern Pa., No. 1	16.50-17.00
Eastern Pa., No. 2	15.50
Federal, Ill, No. 2	12.50-13.00
Granite City, R. R. No. 1	†13.50-14.00
Granite City, No. 2.	12.50-13.00
Los Ang., No. 1, net	11.50-12.00
Los Ang., No. 2, net	10.50-11.00
N. Y. dock No. 1 exp.	13.75
Pitts., No. 1 (R. R.)	18.50-19.00
Pittsburgh, No. 1	17.50-18.00
Pittsburgh, No. 2	16.00-16.50
St. Louis, No. 1	†13.50-14.00
St. Louis, No. 2	†12.25-12.75
San Fran., No. 1, net	11.50-12.00
San Fran., No. 2, net	10.50-11.00
Seattle, No. 1	14.50-15.50
Toronto, dlrs., No. 1	11.00
Valleys, No. 1	18.00-18.50

COMPRESSED SHEETS

Buffalo, new	15.00-15.50
Chicago, factory	15.50-16.00
Chicago, dealers	13.50-14.00
Cincinnati, dealers	12.50-13.00
Cleveland	16.00-16.50
Detroit	†14.50-15.00
E. Pa., new mat.	16.50-17.00
E. Pa., old mat.	14.00-14.50
Los Angeles, net	9.00- 9.50
Pittsburgh	17.50-18.00
St. Louis	†10.00-10.50
San Francisco, net	9.00- 9.50
Valleys	17.50-18.00

BUNDLED SHEETS

Buffalo, No. 1	14.50-15.00
Buffalo, No. 2	13.00-13.50
Cleveland	12.50-13.00
Pittsburgh	16.00-16.50
St. Louis	†9.00- 9.50
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	11.50-12.00
Cincinnati, dealers	8.50- 9.00
Detroit	†11.00-11.50
St. Louis	†8.00- 8.50
Toronto, dealers	9.00

BUSHELING

Birmingham, No. 1	13.00
Buffalo, No. 1	14.00-14.50
Chicago, No. 1	14.00-14.50
Cincin., No. 1, deal.	9.25- 9.75
Cincin., No. 2 deal.	3.50- 4.00
Cleveland, No. 2	10.00-10.50
Detroit, No. 1, new	†13.75-14.25
Valleys, new, No. 1	16.00-16.50
Toronto, dealers	5.50- 6.00

MACHINE TURNINGS (Long)

Birmingham	5.00
Buffalo	10.00-10.50
Chicago	10.50-11.00
Cincinnati, dealers	5.50- 6.00
Cleveland, no alloy	9.50-10.00
Detroit	†8.00- 8.50
Eastern Pa.	9.00- 9.50
Los Angeles	4.00- 5.00
New York	†6.50- 7.00
Pittsburgh	11.00-11.50
St. Louis	†6.50- 7.00
San Francisco	5.00
Toronto, dealers	7.00- 7.25
Valleys	10.00-10.50

SHOVELING TURNINGS

Buffalo	12.00-12.50
Cleveland	10.00-10.50
Chicago	11.00-11.50
Chicago, spcl, anal.	13.00-13.50
Detroit	†8.00- 8.50
Pitts., alloy-free	12.50-13.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†3.75- 4.00
Buffalo	10.00-10.50
Cincinnati, dealers	4.25- 4.75
Cleveland	10.00-10.50
Eastern Pa.	9.00- 9.50
Detroit	†8.25- 8.75
New York	†5.25- 5.75
Pittsburgh	9.50-10.00
Toronto, dealers	6.75

AXLE TURNINGS

Buffalo	15.50-16.00
Boston district	†8.00- 8.50
Chicago, elec. fur.	16.50-17.00
East. Pa. elec. fur.	16.00-16.50
St. Louis	†9.25- 9.75
Toronto	6.00- 6.50

CAST IRON BORINGS

Birmingham	7.50
Boston dist. chem.	†8.25- 8.50
Buffalo	10.00-10.50
Chicago	10.00-10.50
Cincinnati, dealers	4.25- 4.75
Cleveland	10.00-10.50
Detroit	†8.25- 8.75
E. Pa., chemical	14.50-15.00
New York	†7.00
St. Louis	†5.00- 5.50
Toronto, dealers	6.75

RAILROAD SPECIALTIES

Chicago	18.75-19.25

ANGLE BARS—STEEL

Chicago	19.50-20.00
St. Louis	†14.75-15.25

SPRINGS

Buffalo	19.50-20.00
Chicago, coil	19.00-19.50
Chicago, leaf	18.50-19.00
Eastern Pa.	20.00-20.50
Pittsburgh	22.00-22.50
St. Louis	†16.25-16.75

STEEL RAILS, SHORT

Birmingham	16.50
Buffalo	21.50-22.00
Chicago (3 ft.)	19.50-20.00
Chicago (2 ft.)	20.00-20.50
Cincinnati, dealers	18.50-19.00
Detroit	†19.50-20.00
Pitts., 3 ft. and less	22.00-22.50
St. Louis, 2 ft. & less	†18.00-18.50

STEEL RAILS, SCRAP

Birmingham	16.00
Boston district	†14.50-15.00
Buffalo	18.00-18.50
Chicago	17.00-17.50
Cleveland	19.00-19.50
Pittsburgh	19.00-19.50
St. Louis	†15.00-15.50
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net	11.50-12.00
Cincinnati, dealers	10.25-10.75

RAILROAD GRATE BARS

Buffalo	13.00-13.50
Chicago, net	11.00-11.50
Cincinnati, dealers	8.50- 9.00
Eastern Pa.	15.00-15.50
New York	†10.50-11.00
St. Louis	9.50-10.00

RAILROAD WROUGHT

Birmingham	14.00
Boston district	†9.50-10.00
Eastern Pa., No. 1	18.00-18.50
St. Louis, No. 1	10.00-10.50
St. Louis, No. 2	12.50-13.00

FORGE FLASHINGS

Boston district	†10.00-10.25
Buffalo	14.00-14.50
Cleveland	15.00-15.50
Detroit	†13.50-14.00
Pittsburgh	15.50-16.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	19.00-19.50

LOW PHOSPHORUS

Cleveland, crops	22.50-23.00
Eastern Pa. crops	21.00-21.50
Pitts., billet, bloom, slab crops	22.50-23.00

LOW PHOS. PUNCHINGS

Buffalo	19.50-20.00
Chicago	18.50-19.00
Cleveland	18.50-19.00
Eastern Pa.	21.00-21.50
Pittsburgh	21.50-22.00
Seattle	15.00
Detroit	†14.25-14.75

RAILS FOR ROLLING

5 feet and over

Birmingham	16.50
Boston	†15.75-16.00
Chicago	19.00-19.50
New York	15.50-16.00
Eastern Pa.	20.00-20.50
St. Louis	†17.50-18.00

STEEL CAR AXLES

Birmingham	18.00
Boston district	†16.00-16.50
Chicago, net	21.50-22.00
Eastern Pa.	22.00
St. Louis	†18.50-19.00

LOCOMOTIVE TIRES

Chicago (cut)	19.00-19.50
St. Louis, No. 1	14.75-15.25

SHAFTING

Boston district	†17.00-17.50
New York	†18.00-18.50
Eastern Pa.	22.50-23.00
St. Louis, 1¼-3¾"	†16.50-17.00

CAR WHEELS

Birmingham, iron	13.00
Boston dist., iron	†13.00-13.25
Buffalo, steel	21.00-21.50
Chicago, iron	17.00-17.50
Chicago, rolled steel	18.50-19.00
Cincin., iron, deal.	16.75-17.25
Eastern Pa., iron	20.00-20.50
Eastern Pa., steel	20.00-20.50
Pittsburgh, iron	19.50-20.00
Pittsburgh, steel	22.00-22.50
St. Louis, iron	14.50-15.00
St. Louis, steel	†15.50-16.00

NO. 1 CAST SCRAP

Birmingham	15.50
Boston, No. 1 mach.	†15.00-15.50
N. Eng. del. No. 2	14.00-14.50
N. Eng. del. textile	17.00-17.50
Buffalo, cupola	17.50-18.00
Buffalo, mach.	18.50-19.00
Chicago, agri. net	13.50-14.00
Chicago, auto net	16.00-16.50
Chicago, railroad net	14.50-15.00
Chicago, mach. net.	15.50-16.00
Cincin., mach. deal.	16.50-17.00
Cleveland, mach.	20.50-21.00
Detroit, cupola, net	†15.50-16.00
Eastern Pa., cupola	20.00-20.50
E. Pa., No. 2 yard	16.50
E. Pa., yard fdry.	16.50-17.00
Los Angeles	16.50-17.00
Pittsburgh, cupola	17.50-18.00
San Francisco	14.50-15.00
Seattle	12.00-14.00
St. Louis, breakable	†14.00-14.50
St. Louis, agri. mach.	15.75-16.25
St. L., No. 1 mach.	†16.25-16.75
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break	†12.75-13.25
New England, del.	14.50-15.00
Buffalo, break	15.00-15.50
Cleveland, break, net	15.50-16.00
Detroit, auto net	†16.00-16.50
Detroit, break	†13.00-13.50
Eastern Pa.	18.50-19.00
Los Ang., auto, net.	13.00-14.00
New York break	†14.00
Pittsburgh, break	15.00-15.50

STOVE PLATE

Birmingham	10.00
Boston district	†10.50-11.00
Buffalo	14.50-15.00
Chicago, net	10.50-11.00
Cincinnati, dealers	8.75- 9.25
Detroit, net	†9.50-10.00
Eastern Pa.	15.00-15.50
New York fdry.	10.75-11.25
St. Louis	10.50-11.00
Toronto dealers, net	12.00-12.50

MALLEABLE

New England, del.	21.00
Buffalo	19.00-19.50
Chicago, R. R.	20.00-20.50
Cincin., agri., deal.	13.75-14.25
Cleveland, rail	21.00-21.50
Eastern Pa., R.R.	20.50-21.50
Los Angeles	12.50
Pittsburgh, rail	21.50-22.00
St. Louis, R. R.	†16.00-16.50

Ores

Lake Superior Iron Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract.	9.00-10.00

Foreign Ore

(Prices nominal)

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mn.	15.00
North African low phos.	16.00
Spanish, No. African basic, 50 to 60%	16.00
Chinese wolframite, short ton unit, duty paid	$23.50-24.00
Scheelite, imp.	$25.00
Chrome ore, Indian, 48% gross ton, cif.	$26.00-28.00

Manganese Ore

Including war risk but not duty, cents per unit cargo lots.

Caucasian, 50-52%	48.00-50.00
So. African, 50-52%	49.00-50.00
Indian, 49-50%	nom
Brazilian, 48-52%	46.00-48.00
Cuban, 50-51%, duty free	61.20

Molybdenum

Sulphide conc., per lb., Mo. cont., mines	$0.75

Sheets, Strip

Sheet & Strip Prices, Page 92, 93

Pittsburgh—Releases against recent blanket orders have been fair but generally are for current consumption rather than the start of inventory additions. The latter will start shortly, in view of mills' determination to hold to the June 30 deadline for shipments of low-price tonnage. Export business is fairly active, mostly from South America. Foreign orders represent about 10 per cent of total volume. Sheet mill operations are slightly heavier, being close to 60 per cent. Galvanized output also is up a trifle but still is below 50 per cent.

Cleveland—Sheet and strip production is rising on better releases of material booked at recent price concessions. Heavy schedules are indicated the next seven weeks, particularly in June. Quiet in new business is expected to continue into third quarter, as a portion of recent coverage is destined for stock. Galvanized sheet prices are back to 3.50c, base, following a brief period of lower quotations.

Boston — Having covered well through this quarter with blanket contracts at lower prices late last month, buying of narrow cold strip at restored quotations is meager. Specifications against this volume are gradually mounting, resulting in moderately heavier production schedules, but there has been no scramble to get on rolling schedules.

New York — Sheet specifications are expanding slowly, due in part to pressure of sellers for releases. The new reinstated prices are holding fairly well, barring some occasional sniping. Specifications against low-priced cold strip tonnage are spotty. The extent of specifications for shipment by June 30 is expected to depend largely on the firmness of prices during the next few weeks.

Philadelphia — Emphasizing that June 30 would be the deadline for shipment of orders booked at the $4 concession prior to May 1, sellers are meeting moderate success in speeding up specifications. Meanwhile, consumption is a shade better, reflecting principally miscellaneous seasonal influences.

Buffalo—With the end of price reductions, buying of sheet and strip steel has receded. Releases are expected to be well spread over an extended period.

Cincinnati—Backlogs assure high operations through June, provided material on order is released. Mills are attempting to obtain specifications this month in order to even shipments the remainder of the quarter and are aiming at clearing books of current orders by June 30.

Birmingham, Ala.—While below expectations, production of sheets remains fairly active at approximately 80 per cent. Strip output has picked up considerably.

Toronto, Ont.—Sheet demand is steady, with no outstanding orders. Mills now are booked to the end of July and are quoting current prices through June. Large tonnage orders are pending from automobile makers which recently closed contracts for motor vehicles for war purposes, but it is understood that most of this business will go to United States mills. Ordinary domestic demand for sheets largely is being taken care of by Canadian mills although consumers in need of quick delivery are obtaining supplies either from warehouse or from the United States.

Don W. Buckshorn, formerly manager of the Cincinnati office, Louisville & Nashville railroad, has been appointed traffic manager, Crosley Corp., Cincinnati.

Plates

Plate Prices, Page 92

Pittsburgh — Demand generally is well sustained, with orders for light plates and floor plates slightly heavier. Some additional plate orders are being placed for freight cars, these having been specified for some time but not released. New inquiries for freight cars are being rumored, and if they materialize such business would keep shops busy most of this year. Shipbuilding releases have been good, while the rearmament program is occupying forge shops at capacity on heavy plate. Export demand is active, with prices steady.

Chicago — Plate bookings have declined slightly. Considerable tonnage is required for bridges and petroleum industry construction work. Large industrial and outdoor machinery requirements also are prominent, but railroad needs lag. Prices are firmer, following some weakness recently.

Boston — Sustained improvement in plate demand has not developed and buying remains spotty. Miscellaneous users account for most orders, mostly in less-than-car lots for prompt delivery. Shipyard specifications are steady, but not widely distributed. Railroad releases are disappointing. Specified work, including tanks, is limited to a few water storage projects and little tonnage is coming from the oil or paper-pulp industries. Structural and boiler shop demands are light.

New York — Miscellaneous plate buying is slightly heavier, but large inquiries are few. General building requirements have increased and in some measure offset further shrinkage in railroad demand. With bids postponed until June 18 on two luxury liners for the United States maritime commission, action on about 30,000 tons of plates has been delayed correspondingly.

Bids will be opened by the navy June 5 on one, two or three submarines of 1500 tons displacement. Should all three be placed, approximately 2000 tons, mainly plates and involving much alloy steel, will be required.

Philadelphia — More than 50,000 tons of ship steel, mainly plates, is expected to be distributed soon by a district yard. In addition, approximately 750 tons are pending for two cruisers, on which the New York Shipbuilding Corp., Camden, N. J., is low. A moderate tonnage also will be required for one or more steel tugs under contemplation by United States army engineer, Philadelphia. Sun Oil Co., Chester, Pa., is figuring 700 tons for a cracking unit for the Tide Water Oil Co., at Bayonne, N. J. A mild improvement in miscellaneous demand is reported by some platemakers, but lack of railroad specifications is being seriously felt. Prices are steady.

Birmingham, Ala.—Tank manufacturers, some railroad business and requirements for shipbuilding hold plate production to a remarkably steady pace. Much of the tonnage is going to Pacific coast points.

Seattle — Important projects are lacking, shops reporting a fair volume of small tonnages, tanks, boilers, service stations and smokestacks. National Guard, Camp Murray, Wash., will take bids May 15 for a 75,000-gallon water tank on tower. Salem, Oreg., Percy A. Cupper, engineer, plans a 500,000-gallon elevated steel water tank.

San Francisco—No plate awards of size were reported. Pending business calls for more than 7300 tons. The largest pending project involves 4200 tons for large-sized welded steel or reinforced concrete pipe for Los Angeles, up for bids May

14. So far this year 23,760 tons have been placed, compared with 16,330 tons for the same period a year ago.

Toronto, Ont.—Heavy covering in plates for shipbuilding needs in this country earlier in the year is taking care of most current needs and new demand has slackened. With practically all Canadian plate output booked for the remainder of the year, new business is passing to United States companies. Imports continue in good volume, mostly against contracts.

Plate Contracts Placed

1100 tons, steel penstocks, Parker Power dam, California-Arizona, to Chicago Bridge & Iron Co., Chicago.

310 tons, 60,000-barrel and 17,640-barrel tanks, Kendall Refining Co., Bradford, N. Y., to Hammond Iron Works, Warren, Pa.

100 tons, gasoline supply, welded barge for United States engineer, Bonneville, to Commercial Iron Works, Portland, Oreg.

Plate Contracts Pending

Unstated tonnage, one steel barge and equipment, United States engineer, St. Paul, Dravo Corp., Pittsburgh, low, $89,550, bid under pro. 44.

Unstated tonnage, one or more all-welded 56-foot diesel powered steel tugs, United States engineer, Philadelphia.

Bars

Bar Prices, Page 92

Pittsburgh—Demand for most grades is heavier, although cold-finished bars are slightly less active, due to reduced needs of automotive interests. Export business is sustained, accounting for about 15 per cent of total volume. Prices usually are firm, although some irregularities have appeared in extras. Jobbers' releases and miscellaneous needs are fair. Consumer stocks generally are moderate, but with steady prices in prospect buyers are not inclined to cover forward needs.

Prices of cold-drawn carbon and alloy steel bars and shafting were reaffirmed for the third quarter by a prominent producer here. This covers material for delivery to and including Sept 30.

Chicago—Carbon and alloy bar demand has been increased slightly. Automotive interests continue to participate actively. Farm machinery makers, while not as strong as a month or two ago, are still prominent as a source of demand. Forgers are operating at consistent rates, with most business coming from aircraft, petroleum and diesel engine sources. Bar prices are reasonably firm, ranging between 2.00c and 2.10c, with considerable portion of present business going at the latter figure.

Boston—Demand for alloy bars covers a wide range of specifications and is well maintained, particularly by machine tool builders and the aircraft industry. Deliveries on some highly-finished alloys are slow, but hot-rolled carbon bar shipments are practically normal. Crucible Steel Co. of America was awarded by lot the last 170 tons of nickel steel bars for chain-making, for Boston navy yard, at $16,178.20 delivered.

New York—Active demand continues from machine tool builders. Automotive equipment manufacturers also are busy, and business from bolt and nut makers is slightly heavier. Miscellaneous requirements are fair, but railroad specifications are light. Prices are steady. Deliveries on plain carbon bars hold at three to four weeks.

Philadelphia—Commercial bar demand is well sustained, with small forgers specifying the most freely of any consuming group. Deliveries on plain carbon bars average around three weeks, a shade better than recently. Jobbers still have

fair stocks, but consumers have cleaned up excess stocks.

Buffalo—Mills quickened rolling schedules slightly last week on a minor increase in miscellaneous buying. Motormakers, machine manufacturers and suppliers of motor parts were in the market for slightly more tonnage. Mills report consumers generally seek immediate delivery, indicating that consumers' inventories generally are light.

Toronto, Ont.—Mining companies provided a large part of the bar business closed during the past week. Manufacturing concerns furnish steady flow of small tonnage orders. Future delivery booking by Canadian mills has run to good volume for current quarter, although bar deliveries on new orders are obtainable in less than a month in some instances.

Ferroalloys

Ferroalloy Prices, Page 94

New York—Domestic ferromanganese shipments reflect improved steelmaking operations, with prices steady at $100, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is holding at $32, Palmerton, Pa., and 26 to 28 per cent, at $39.50.

Pipe

Pipe Prices Page 93

Pittsburgh—Pipe demand generally is unchanged, although oil country goods are more active. Movement from southern warehouses to the oil fields is at the best rate this year. Demand for merchant pipe, mechanical tubing and pressure tubing is steady. Prices are relatively firm, except on merchant items in secondary markets, where reports of shading persist.

Boston—Merchant steel pipe requirements for building are slightly heavier in some districts, but little improvement is noted around Boston. Resale prices are mixed. Plumbing supply buying continues to lag. Small orders and contracts for cast iron pipe are numerous, but total tonnage is below normal, with utilities and the oil industry placing little.

New York—Department of purchase will advertise for bids on 10,641 tons, 4 to 20-inch cement-lined cast pipe for the New York city stock yards, the largest inquiry in many months. Meanwhile domestic buying is light with export inquiry well sustained. Westover field, army base, Chicopee, Mass., closes May 16 on 18,000 feet small diameter steel pipe.

Scovill Mfg. Co., Waterbury, Conn., is low on 147,200 pounds copper-nickel alloy condenser tubes for the Puget Sound navy yard, Washington, at $52,903.68 delivered, schedule 1328, bids April 30.

Philadelphia — Between 600 and 700 tons of stainless tubing is being figured by the Sun Oil Co., Chester, Pa., for an oil refining unit at Bayonne, N. J., for the Tidewater Oil Co. Merchant pipe business shows only slight seasonal improvement, with resellers competing sharply.

Birmingham, Ala.—Pipe tonnage is distinctly disappointing. One of the district's largest plants has one shop down, but is operating the other four or five days a week, but mostly on small scattered lots. Utilities are out of market and the available tonnage is mostly from municipalities, with some scattered government contracts.

Seattle—After 60 days of activity, demand for cast iron pipe has dropped and no important projects are pending. Several cities are con-

sidering major improvements but plans are not completed. Spokane city council has approved a WPA water system improvement to cost $290,569, involving 17 miles of water mains, materials estimated at $147,-364.

San Francisco — Cast iron pipe lettings were confined to lots of less than 100 tons. To date this year 11,690 tons have been placed, compared with 10,058 tons for the corresponding period in 1939.

Cast Pipe Pending

158 tons, 6 and 12-inch, San Diego, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

120 tons, 8-inch, cement-lined, Panama, schedule 4022, bids May 7; Lynchburg Foundry Co., Lynchburg, Va., low.

Rails, Cars

Track Material Prices, Page 93

Freight car buying this year is holding its own, April purchases totaling 2077 units, compared with 3104 for March. For four months this year the aggregate is 6688 units, against 6157 for the same period last year. Further comparisons follow:

	1940	1939	1938	1937
Jan.	360	3	25	17,806
Feb.	1,147	2,259	109	4,972
March	3,104	800	680	8,155
April	2,077	3,095	15	9,772
4 mos.	6,688	6,157	829	40,705
May	.....	2,051	6,014	4,732
June	.....	1,324	1,178	548
July	.....	110	0	1,030
Aug.	.....	2,814	182	1,475
Sept.	.....	23,000	1,750	1,216
Oct.	.....	19,634	2,537	1,355
Nov.	.....	2,650	1,232	275
Dec.	.....	35	2,581	275
Total	.....	57,775	16,303	51,611

Some small buying is being done, 446 cars being placed last week, in six lots. Several important lots are pending, including 1250 for the Gulf, Mobile & Northern, Nashville, Chattanooga & St. Louis 250, and Denver & Rio Grande Western 500.

Colorado Fuel & Iron Corp., Denver, has booked 100,000 tie plates for the Panama railroad, at $25,000.

Car Orders Placed

Cambria & Indiana, 200 hopper cars, to Bethlehem Steel Co., Bethlehem, Pa.

Chesapeake & Ohio, 100 fifty-foot flat cars, to Pullman-Standard Car Mfg. Co., Chicago.

Detroit & Mackinac, 5 box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Louisville & Nashville, 50 seventy-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York Central, one stainless steel passenger car, to Edward G. Budd Mfg. Co., Philadelphia.

Pennsylvania railroad, 100 seventy-ton hopper cars, under construction at Altoona, Pa., shops; part of program announced last fall, for which steel has been purchased.

Southern Railway, 75 seventy-ton all steel covered cement cars, to Pullman-Standard Car Mfg. Co., Chicago.

Tennessee Coal, Iron & Railroad Co., 16 fifty-yard dump cars, to Pressed Steel Car Co., McKees Rocks, Pa.

Car Orders Pending

Louisville & Nashville, 25 to 100 cement cars; contemplated.

Locomotives Pending

United States army engineer, Washington, one 8-ton and one 20-ton gasoline-mechanical drive locomotive; bids May 9.

Wire

Wire Prices, Page 93

Pittsburgh—With nearly all merchant buyers covered on wire nail requirements, prices are back to normal. Other merchant wire products are steady, with volume moderate. Releases against manufacturers' wire commitments are light,

and new buying is largely hand-to-mouth. Prices are firm on manufacturers' items. Export volume is good with prices strong.

Cleveland — Business is fairly steady in both manufacturers' wire and merchant products. Both wire and rods are active in the export market. Moderately heavy domestic business was done in nails recently at price concessions which have since been withdrawn.

Chicago—Wire and wire product demand shows minor expansion, though in general there is no notable change in sales.

Automotive requirements continue important and agricultural implement needs, especially for tractors, have held up somewhat better than expected.

New York—Wire buying, well diversified, is gradually mounting with more general replacement orders appearing in addition to well maintained fill-in volume. Incoming tonnage is being booked in excess of last month with indications consumer inventories have been worked down materially, notably manufacturers' wire.

Boston—Wire demand is slightly improved, numerous specialties and manufacturers' wire making moderate gains. Buying is well diversified and some broader replacement orders are included, with tonnage above last month. Finishing mill operations for this district as a whole are heavier than ingot output, around 60 per cent, slightly better in some instances.

Birmingham, Ala.—Some slackening has been evident in wire products and production has tapered measurably. Improvement, however, is anticipated since weather conditions have become more suitable for outside work.

Shapes

Structural Shape Prices, Page 92

Pittsburgh—Demand is sustained as domestic construction is aided by a number of public jobs, as well as by a steady flow of new private business. Prices are fair on fabricated goods, while export market is active at steady prices.

Chicago—Orders are increasing, with structural shops generally operating at a fair rate. Improved feeling is noted among fabricators, due to increased activity in building construction and more private sponsorship. A few small state bridges are pending.

Boston — Hoosic river bridge, North Adams, Mass., closing May 21 with the department of public works, Boston, takes 1200 tons, the largest bridge inquiry in the district this year. Bids close May 28 on a plate girder span, Hardwick, Mass., approximately 150 tons. Awards are slightly more numerous with no large tonnages involved, a bus garage at South Boston taking 250 tons.

New York — Structural tonnage placed is substantially higher, although the aggregate total is influenced by a few large projects, including 7500 tons for the Rainbow bridge, Niagara Falls, N. Y., and

Shape Awards Compared

	Tons
Week ended May 11	32,341
Week ended May 4	13,409
Week ended April 27	11,204
This week, 1939	34,765
Weekly average, year, 1940	17,477
Weekly average, 1939	22,411
Weekly average, April	10,851
Total to date, 1939	439,347
Total to date, 1940	332,066

Includes awards in United States of 100 tons or more.

grade crossing work at Syracuse, N. Y. Purchase is also expected this week of 7000 tons for two sections, Atlantic avenue grade crossing for the Long Island railroad, Brooklyn, N. Y. New inquiry slackened again.

Philadelphia—Several large structural jobs are being figured, including 2000 tons for a factory building for Celanese Corp., Narrows, Va.; 1700 tons for the District of Columbia armory in Washington; and 800 tons of tunnel ribs for the Youghiogheny dam, Confluence, Pa.

Buffalo—After starting the year with fairly good inquiry, interest in the structural steel market seems to have slackened. A few small industrial projects are pending, but aggregate tonnage is not substantial.

San Francisco — The structural shape market was active and 4690 tons were placed, bringing the aggregate for the year to 66,553 tons, compared with 49,626 tons for the corresponding period in 1939. Columbia Steel Co. secured 1500 tons of sheet piling for a graving dock at the navy yard, Mare Island, Calif. Moore Drydock Co. took 1300 tons for a new plant in Oakland, Calif., for Loose-Wiles Biscuit Co.

Toronto, Ont.—Structural awards continue high. Awards for the week were over 3000 tons, with about 7000 tons pending. No outstanding contracts were reported during the past week or ten days, most awards being under 500 tons.

Shape Contracts Placed

7500 tons, arch bridge, main span, Rainbow bridge, Niagara Falls, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., $1,451,823, through Niagara Falls Bridge commission.

6000 tons, grade crossing eliminations, Delaware, Lackawanna & Western railroad, Syracuse, N. Y., to American Bridge Co., Pittsburgh; Elmhurst Contracting Co., New York, general contractor.

1900 tons, structural steel caisson gates and accessories for dry dock No. 2, navy yard, Pearl Harbor, T. H. and dry dock No. 5, Puget Sound navy yard, Bremerton, Wash., to Moore Dry Dock Co., San Francisco, $525,070; bids, April 24, spec. 9440, chief, bureau of yards and docks, navy department, Washington.

1750 tons, viaduct, New York Central railroad, Eleventh avenue and Thirty-fifth street, New York, to Lehigh Structural Steel Co., Allentown, Pa.; Duffy Construction Co., New York, general contractor.

1500 tons, sheet piling, graving dock, navy yard, Mare Island, Calif., to Columbia Steel Co., San Francisco.

1400 tons, hangar, LaGuardia Field, New York, to Bethlehem Steel Co., Bethlehem, Pa.; bids May 6, procurement division, treasury department, New York.

1300 tons, plant for Loose-Wiles Biscuit Co., Oakland, Calif., to Moore Dry Dock Co., Oakland, Calif.

1135 tons, rebuilding blast furnace G, Youngstown Sheet & Tube Co., Youngstown, O., to William B. Pollock Co., Youngstown.

880 tons, two pot rooms, for Aluminum Co. of America, Vancouver, Wash., to Bethlehem Steel Co., Bethlehem, Pa.

725 tons, shop building, City Machine & Tool Co., Toledo, O., to R. C. Mahon Co., Detroit.

600 tons, press building, for Hydraulic Press Mfg. Co., Mt. Gilead, O., to Fort Pitt Bridge Works, Pittsburgh.

565 tons, three bridges for Northern Pacific railway, Yakima county, Wash., reported to American Bridge Co.

520 tons, extensions to warehouses 1 and 3 and loading platform, for Owens-Illinois Glass Co., Streator, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

450 tons, addition for Maitland Spinning Mills, Listowel, Ont., to Hamilton Bridge Co. Ltd., Hamilton, Ont.

422 tons, Blue river bridge, Kansas City, Mo., to Kansas City Bridge Co., Kansas City, Mo.

410 tons, coal handling system, Central New York Power Corp., Oswego, N. Y., to Lackawanna Steel Construction Co., Buffalo.

400 tons, gates for Sepulveda dam, Los Angeles, specification 74, to Commercial Iron Works, Portland, Oreg.

400 tons, building, Robins Conveyor Belt Co., Burlington, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

330 tons, underpass near Davis, Solano county, Calif., for state, to Bethlehem Steel Co., San Francisco.

325 tons, addition for Canadian Westinghouse Co. Ltd., Hamilton, Ont., to McGregor & McIntyre Iron Works Ltd., Toronto, Ont.

300 tons, buildings for Douglas C. Greey, 56 Esplanade, Toronto, to Standard Iron Works Ltd., Toronto, Ont.

300 tons, National Research Laboratory, Ottawa, Ont., to Dominion Reinforcing Steel Co., Montreal, Que.

300 tons, church and rectory, Etobicoke, Ont., to John T. Hepburn Ltd., Toronto, Ont.

280 tons, state highway bridge, Chase county, Kans., to Pittsburgh Des Moines Steel Co., Pittsburgh.

280 tons, technical service building, Sunnyvale, Calif., for United States government, to Moore Dry Dock Co., San Francisco.

264 tons, state highway bridge, Neosho Rapids, Kans., to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

240 tons, viaduct FAGS-81, Clarks, Nebr., for state, to St. Joseph Structural Steel Co., St. Joseph, Mo.

240 tons, bus garage, offices and paint shop, New England Greyhound lines, South Boston, Mass., to American Bridge Co., Pittsburgh.

220 tons, Morey machine shop, Astoria, N.Y., to Jones & Laughlin Steel Corp., Pittsburgh.

210 tons, addition, furnace building No. 5, National Carbide Corp., Ivanhoe, Va., to Carolina Iron & Steel Co., Greensboro, N. C.

200 tons, factory building, for Jones & Lamson Machine Co., Springfield, Vt., to American Bridge Co., Pittsburgh.

200 tons, germinating building for Canada Malting Co., Queen's Quay, Toronto, to Canadian Bridge Co. Ltd., Walkerville, Ont.

195 tons, including 154 tons of bearing and sheet steel piling, East Fullerton Creek dam, Orange County, California, for United States engineer office; 124 tons to Columbia Steel Co., San Francisco, and remainder to unstated interests.

190 tons, precipitator and gas mains for blast furnace G., Youngstown Sheet & Tube Co., Youngstown, O., to William B. Pollock Co., Youngstown.

180 tons, store building 199, for F. W. Woolworth Co., Malden, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

180 tons, manufacturing plant, for Rheem Mfg. Co., Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, armory, Shreveport, La., to The Beaird Corp., Shreveport, La.

170 tons, theater, Dearborn, Mich., to R. C. Mahon Co., Detroit.

170 tons, bridge FAGM-803-B, Fannin county, Texas, to Virginia Bridge Co., Roanoke, Va.

145 tons, gantry crane for Fern Ridge dam, Oreg.; bridge crane for United States Indian service, Wapato, Wash.; and 200-ton overhead traveling crane for Parker dam project, Earp, Calif., to Cyclops Iron Works, San Francisco.

140 tons, state bridge, Milford, Conn., to American Bridge Co., Pittsburgh; D. V. Frione Co., New Haven, contractors.

125 tons, parochial school, Larchmont, N. Y., to Ingalls Iron Works, Birmingham.

120 tons, state bridge PSC-5372, Medford, N. Y., to American Bridge Co., Pittsburgh.

120 tons addition to building 18, for General Motors Corp., Ternstedt Mfg. division, Detroit, to American Bridge Co., Pittsburgh.

120 tons, bridge, Wilbur Cross parkway, West Willington, Conn., for state, to American Bridge Co., Pittsburgh.

115 tons, bridge, Monroe township, O., to Fort Pitt Bridge Works, Pittsburgh.

110 tons, extension to service building, for Aluminum Co. of America, Vancouver, Wash., to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, women's dormitory, Massachusetts State College, Amherst, Mass., to Haarmann Steel Co., Holyoke, Mass.

105 tons, bridge FAS-114-A, Coleman county, Texas, to Peden Iron & Steel Co., Raleigh, N. C.

100 tons, extension to rectifier building, for Aluminum Co. of America, Vancouver, Wash., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, Grady Homes housing project, Atlanta, Ga., to Calvert Iron Works Inc., Atlanta; Virginia Engineering Co., Newport News, Va., general contractor.

Shape Contracts Pending

2000 tons, factory building, Celanese Corp., Narrows, Va.; bids being received.

1700 tons, extensions to building 16, for Aluminum Co. of America, Lafayette, Ind.

1700 tons, armory, government of District of Columbia; bids May 21.

1500 tons, landplane hangar S, North Beach airport, New York.

1350 tons, steel sheet piling, upper en-

trance, Keweenaw waterway, Michigan; bids May 14, U. S. engineer, Duluth, pro. 41.

1290 tons, piling, substructure, bridge for United States army engineers, St. Georges, Del., bids May 27; also approximately 1000 tons of reinforcing bars.

1000 tons, beam bridges, various locations, Georgia, for state.

843 tons, steel sheet piling, flood protection, Brookport, Ill.; bids June 1.

750 tons, plant for Leslie Salt Co., Centerville, Calif.; bids being taken.

718 tons, dam, Kanapolis, Kans., United States engineer's office, Kansas City, Mo.; bids May 10.

700 tons, public school 99, New York; Skolnick Construction Co., New York, low, bids May 6.

645 tons, four highway bridges, state of Arkansas; bids May 9.

450 tons, factory for O'Bear-Nester Glass Co., East St. Louis, Ill.; George A. Barnes, East St. Louis, Ill., general contractor.

450 tons, Mississippi river guard wall extensions, locks and dams Nos. 11, 16, 18, 20 and 21; bids postponed to May 17, to United States engineer's office, Rock Island, Ill.; also 175,950 square feet steel sheet piling.

410 tons, including H-piles, Forge Road railroad bridge, Warwick, R. I.; bids May 23, Herman H. Landgraf, division of purchase, Providence.

368 tons, spillway operating bridge, Watts Bar dam; bids May 29 to Tennessee Valley Authority, Knoxville, Tenn.

365 tons, bridge, Union Pacific railroad, Los Angeles, for army engineers.

360 tons, state highway bridge, Erie county, Pennsylvania; bids May 10.

350 tons, embedded metalwork, specification 1358-D, Friant, Calif., for bureau of reclamation.

350 tons, fertilizer plant, Wilmington, Del.; bids May 7.

330 tons, pier plates and trusses, specification 1362-D, Friant, Calif., for bureau of reclamation.

330 tons, plant and office building, for Eastern States Farmers exchange, Wilmington, Del.

325 tons, building, Kings County hospital, Brooklyn.

300 tons, tunnel ribs, Youghiogheny dam, Confluence, Pa.; bids May 8.

280 tons, state highway bridge, Moreau Junction, S. Dak.; bids May 14.

270 tons, repairs to viaduct, Richmond, Va., for Chesapeake & Ohio railway.

250 tons, cell block, Auburn state prison, Auburn, N. Y.; bids May 23.

225 tons, state highway bridge, Oglesby, Ill.; bids in.

225 tons, tube mill, American Brass Co., Waterbury, Conn.

220 tons, crane tracks metalwork, specification 1365-D, Odair, Wash., for bureau of reclamation.

220 tons, headworks structure metalwork, specification 1360-D, Knightsen, Calif., for bureau of reclamation.

220 tons, annealing furnace building, for Timken Roller Bearing Co., Canton, O.

207 tons, bearing piles, two bridges at Pescadero, San Mateo county, Calif., for state; bids opened.

200 tons, warehouse, bureau of reclamation, Odair, Wash.; bids May 17.

200 tons, Lamokin housing project, Chester, Pa.; Stofflet & Pillotson, Philadelphia, low on general contract; 245 tons of bars also required.

175 tons, extraction and preparation building, for Buckeye Cotton Oil Co., Louisville, Ky.

175 tons, public school 30, West New Brighton, Staten Island, New York.

165 tons, bridge Murphysboro, Ill., for Illinois Central system.

150 tons, steel for gun racks, Bellevue, D. C., for United States navy.

130 tons, bridge over Indian river, Alaska, for Alaska railroad.

130 tons, building, for Chevrolet Motor Co., Norwood, O.

126 tons, (also 73 tons reinforcing and castings) repairs to Celilo canal locks, Columbia river; bids to United States engineer, Bonneville, May 29.

125 tons, building, Corning Fibre Box Corp., Corning, N. Y.

125 tons, building, for W. H. Hofman, Oneonta, N. Y.

120 tons, power station extension, for Marion-Reserve Power Co., Marion, O.

103 tons, bulkhead gate tracks, specification 1351-D, Grand Coulee dam, Washington; bids opened.

100 tons, state highway bridge, Rossville, Ill.; bids in.

Unstated tonnage, structural steel units, sliding and rolling gates and gate lifting devices for special projects 9, Panama Canal; Bethlehem Steel Co., Bethlehem, Pa., low $92,316, schedule 4027, bids May 8, Washington.

Behind the Scenes with STEEL

Back Again

■ You probably all remember the puzzle picture of the cow we ran in the January 15 issue and you may have seen it reprinted since in several house organs and local papers. It's caused a lot of fun wherever it appeared, provoking some very peculiar answers. Best of the bunch, however, were the responses to *The Prairie Farmer* which ran the beautiful bovine in a recent issue. Altogether, over 1300 answers came back and 75 per cent saw Molly for what she was. The rest figured she was everything from a pack of hounds and a swarm of bees to a portrait of General Grant.

No Fair Peeking

■ Speaking of cows, we'll bet last year's straw hat you'll have to take a wild guess on whether a cow has teeth and if so, how many.

Sparko Joins Elektro

■ Visitors this year to the Westinghouse exhibit at the New York World's Fair will find Elektro, the mechanical man, joined by Sparko, the electrical dog, who runs and frolics at the heels of his robot master. Sparko has two 1/20 h. p. motors inside him: one makes him walk and the other sets him down and stands him up. It is rumored the only trouble they had in housebreaking Sparko was to make him keep from getting his wires crossed.

Family Ties

■ Last week, right before Mother's Day, one of our circulation salesmen up in New England sent along a most appropriate report covering his call on the secretary and treasurer of a Worcester, Mass., plant. The boys out in the shop all liked STEEL and the s. & t. looked like a sure cinch to approve the order but right at the crucial moment, he explained very simply, "Sorry, but I'll have to ask my mother first." And there sat Mama in the next office, running the outfit!

Not Too Tough

■ Experts Taylor and Morelock breezed in with the correct answer for last week along with several of the mere struggling geniuses. "A" left at 3:39 P. M. and "B" at 3:42 P. M. This week's is from one of our friends who covers the waterfront: The bottom four rungs of a ladder hanging from the topsides of a ship at anchor are just submerged. Each rung is 2 inches wide and the rungs are 11 inches apart. If the tide rises at the rate of 18 inches per hour how many rungs will be submerged at the end of 2 hours?

Short Lived?

■ You won't mind, will you, if we take a minute off to needle our New York readers about their world champeen ball club which seems to be delighting the country with a "wrong-way Corrigan".

Highlights

■ Our vote this week for a perfectly beautiful reproduction goes to Koppers for their spread on pages 66-67. For two other dandies, don't overlook Gulf on page 7 or Basic Dolomite on page 5. And for some reason we are always very impressed with an "expression of policy", such as stated by Colonial Broach on page 16.

Worth Waiting For

■ This last week we spent several hours going over and digesting the new service STEEL is shortly going to present to all its readers. You'll get the details in a special announcement soon, but take our word for it now, it's the real McCoy.

■ And again we say:
Read STEEL—and PROFIT!

SHRDLU

—The Market Week—

Reinforcing

Reinforcing Bar Prices, Page 93

Pittsburgh—Market is active but prices lack firmness, quotations being mostly 1.60c to 1.90c, although some rail bars have been sold as low as 1.40c. Export market is active, with prices steady at 2.10c after having been at 2.15c for some time. Domestic inquiry is good. Bookings, while not heavy, are causing caution on delivery promises.

Chicago—Pending busines is slightly heavier, with most individual jobs small. An outstanding exception is the superstructure of Northwestern university's new technical school, involving 1500 tons. Better activity in private construction is providing numerous small orders.

Boston—Highway mat requirements are heavier for Connecticut and Rhode Island projects, most of 550 tons for the former state having been placed and close to 200 tons is included in another opening this week. Awards also include 112 tons for a bridge, Milford, Conn. Except for housing construction, most pending inquiry and purchases are for small lots with concrete bar prices, both billet and re-rolled steel, weak.

New York—Award of 1680 tons of concrete bars for the East River housing project, New York, is outstanding. Pending work is heavier, but contractor-buyers, taking full advantage of sagging prices, are shopping for further concessions and in some instances are slow to close.

Seattle—Absence of major state highway projects in the Pacific Northwest, is reflected in the depressed state of the reinforcing market. No outstanding tonnages are pending and rolling mills are on reduced schedules. Backlogs generally have been cleaned up.

Philadelphia—Although reinforcing bar orders are light, several large jobs are being figured. Thomas F. Gibson, Philadelphia, is taking figures on 1500 tons for a plant

Concrete Bars Compared

	Tons
Week ended May 11	7,945
Week ended May 4	7,859
Week ended April 27.....	1,725
This week, 1939	9,997
Weekly average, year, 1940.	8,063
Weekly average, 1939.....	9,197
Weekly average, April....	9,875
Total to date, 1939..	200,809
Total to date, 1940.....	153,207

Includes awards in United States of 100 tons or more.

addition for the Campbell Soup Co., Camden, N. J., and United States army engineers are taking bids, opening May 27, on a bridge at St. Georges, Del., requiring 1000 tons of reinforcing steel and 1290 tons of piling.

San Francisco—Of special interest was the opening of bids on 4780 tons for improvement work on the Los Angeles river channel between Fourth street and Olympic boulevard, Los Angeles. Pending business calls for more than 15,000 tons. Bids have also been taken on 181 tons for two bridges at Pescadero, San Mateo county, Calif.

Reinforcing Steel Awards

2000 tons, Sinepuxent bay bridge, Ocean City, Md. divided between Bethlehem Steel Co. and unstated interest.

1680 tons, East River housing project, New York, to Carroll-McCreary & Co. Inc., Brooklyn; George F. Driscoll Co., Brooklyn, general contractor.

1200 tons, grade crossing elimination, Delaware, Lackawanna & Western railroad, Syracuse, N. Y., to Bethlehem Steel Co., through Elmhurst Contracting Co., New York.

800 tons, Grady Homes housing project, Atlanta, Ga., to Southern General Fireproof Co., Atlanta; Virginia Engineering Co., Newport News, Va., general contractor.

750 tons, Clearwater reservoir, Piedmont, Mo., to Laclede Steel Co., St. Louis; United Construction Co., Winona, Minn., contractor.

265 tons, billet, Manchester avenue bridge, Kansas City, Mo., to Sheffield Steel Corp., Kansas City, Mo.

250 tons, bureau of reclamation, invitation B-38,246-A, Odair, Wash., to Bethlehem Steel Co., Seattle.

225 tons, building, Andrew Jergens Co., Belleville, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; James Stewart & Co., New York, general contractor.

185 tons, rail, Hubbard Ice & Fuel Co., Cedar Rapids, Iowa, to Laclede Steel Co., St. Louis.

150 tons, substructure East Chester creek bridge, New York, to Bethlehem Steel Co., through Northeastern Construction Co., New York.

130 tons, addition, public school No. 30, Staten Island, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., through Lynn Construction Co., New York.

105 tons, gymnasium and auditorium, Albany, Calif., to Truscon Steel Co., San Francisco.

105 tons, Hutchinson river parkway section, Westchester county, New York, to Seaboard Steel Products Corp., New York.

100 tons, annex buildings and hangar, Chanute Field, Ill., to Laclede Steel Co., St. Louis; Manhattan Construction Co., Muskogee, Okla., general contractor.

Reinforcing Steel Pending

4780 tons, improvement Los Angeles river channel between Fourth street and Olympic boulevard, Los Angeles; Morrison-Knudsen Co., 411 West Fifth street, Los Angeles, low on general contract at $911,037.

2000 tons, armory, Washington.

1500 tons, plant addition, Campbell Soup Co., Camden, N. J.; bids asked through Thomas F. Gibson, Philadelphia, contracting engineer.

1250 tons. Mississippi river guard wall extensions, locks and dams Nos. 11, 16, 18, 20 and 21; bids postponed to May 17, United States engineer's office, Rock Island, Ill.

1000 tons, bridge for United States army engineers, St. Georges, Del.; bids May 27; also 1290 tons of piling.

700 tons, repairs and extension to shipways No. 2 and No. 3, navy yard, Philadelphia; bids May 15.

493 tons, federal flood control project, Walla Walla, Wash.; bids in to U. S. engineer, Portland, Oreg.

460 tons, overpass, Nickel Plate railroad, Kingsville, O.

400 tons, warehouse, Calvert Distillery Co., Relay, Md.; bids May 14.

245 tons, Lamokin housing project, Chester, Pa.; Stoffiet & Pillotson, Philadelphia, low on general contract; 200 tons of shapes also required.

227 tons, four highway bridges, state of Arkansas; bids May 9.

150 tons, state bridges in Wasco and Umatilla counties, Oreg.; bids in.

135 tons, including 90 tons of piling, tunnel, Frankford arsenal, Philadelphia; bids May 9.

135 tons, levee embankment, Golonda, Ill., bids May 28 to U. S. engineer, Louisville, Ky. Work also takes 144 tons steel sheet piling.

125 tons, highway mats, additional section, Fairfield, Conn.; bids May 13.

120 tons, steel sheet piling, flood protection work, Mounds and Mound City, Ill., bids May 31 to United States engineer, Louisville, Ky.

117 tons, flood protection, Brookport, Ill.; bids June 1.

115 tons, bridge, Vermont Central railroad, Wilmington, Conn.

Tin Plate

Tin Plate Prices, Page 92

Tin plate operations were steady the past week at 65 per cent. Sell-

ers expect increases in domestic business shortly, as well as continued good volume from the export markets. Most of the current export business is now South American, but there is fair volume from other sources.

Pig Iron

Pig Iron Prices, Page 94

Pittsburgh — Merchant iron demand is fair. Business gradually is being put on the $23 basis, although some contracts are being extended. Releases are fair, but new buying is hand-to-mouth. Steel foundries lead gray iron units in activity, although radiator companies report fair activity.

Cleveland—Shipments are moderately heavier than a month ago and are expected to maintain this margin throughout May. Buying still is light but improved slightly as additional consumers find inventory replacement necessary. Foundry operations generally are well sustained. Export inquiries continue to reach this district, but prices that can be realized make them unattractive.

Chicago — Buying the past three to four weeks has been heavier than during the previous two months but still is not large. Inventories of some consumers are low, this being an important factor in stimulating purchases. Shipments are steady, with little change expected in the May movement. A like situation prevails in foundry coke.

Boston — Pig iron shipments against orders are maintained, but new buying has not developed in volume, with small spot lots for prompt delivery making up most new business.

New York — Domestic buying is light, but specifications are slightly more active, reflecting seasonal influences. Demand from soil pipe manufacturers has improved noticeably. Danger of war has curtailed inquiries from the Balkans, held up action on inquiries already being figured and reduced new specifications.

Philadelphia—The foundry melt is expanding slowly, but sufficiently, it is believed, to place May specifications from domestic consumers at the high peak of the year to date. Foreign inquiry has declined, due primarily to the tense Mediterranean situation, which has delayed action on inquiries from Italy and some Balkan states.

Buffalo—Shipments do not reflect the increase in ingot operations, being down slightly. Sellers expect consumers back in the market soon. Foundry operations continue spotty as some melters are operating three days a week, while others, working on government munition orders, are maintaining full five-day weeks.

St. Louis — Shipments have expanded this month, with considerable improvement over April expected for May as a whole. Stove foundries are operating an average of three to four days weekly but are expected to increase schedules in June in anticipation of fall deliveries.

Cincinnati—Specifications point to little change in shipments this month compared with April. Business of jobbing plants is spotty. Stove production is disappointing, but output of machine tool castings continues heavy.

Toronto, Ont.—Merchant pig iron sales show little change. Melters are taking iron in lots up to 300 tons, although inquiries indicate early increase in demand. Melters on the Great Lakes are preparing to replenish supplies and are expected to close fairly large tonnage orders for water delivery soon.

Scrap

Scrap Prices, Page 96

Pittsburgh—Scrap markets continue strong, with principal grades substantially higher. Both railroad and No. 1 steel moved up $1.50, with railroad specialties up 50 cents. Open-hearth shops are showing a little more interest now that operations are increasing. Steel foundry activity has been the real backbone of the market, although one mill has bought heavy melting steel at $18.

Cleveland — Heavy steelmaking grades have advanced $1 per ton here and in the Valley and borings and turnings have advanced 50 cents. Consumers are not buying but dealers are holding stocks and taking in all offerings. A cargo by lake from Duluth has docked here.

Chicago — Despite absence of active mill buying, scrap prices continue to rise. Last consumer purchase of No. 1 heavy melting steel was at $16, but with brokers paying up to $16.50, the market is 50 cents higher. A number of other grades also are up 50 cents, including borings, turnings and specialties.

Boston—While there is no general upswing in scrap prices, the tone is firmer and a few grades have advanced slightly, busheling 50 cents a ton to $9.25, shipping point. No. 1 bundles bring $11.50 to $12, with demand fairly strong. Foundries are buying sparingly, No. 1 cast being quoted $17.50 to $18.50, delivered,

depending on freight charges.

New York—Higher prices in other districts are not being reflected in brokers' buying quotations in this area. Shipments to eastern consumers are slightly heavier, though buying is light. No. 1 heavy melting steel commands 50 cents higher in northern New Jersey than in New York.

Philadelphia — While prices generally are unchanged, offerings are heavier as export demand appears less promising. Involvement of Italy in the war would remove a leading foreign buyer from the market, and England appears disposed to purchase semifinished steel and pig iron rather than scrap, in view of the shortage of ships.

Buffalo—Strength in the iron and steel scrap market is more pronounced as sales were reported in other areas at higher levels. It was indicated too, that mills may even have difficulty obtaining substantial tonnage at the recently advanced range of $16.50 to $17 a ton for No. 1 heavy melting steel.

Detroit — The market continues buoyant, bolstered by good dealer buying and moderate purchasing for consumption, but is viewed as spotty in some quarters as large buyers continue out of the market. Price advances of 50 cents are registered on most grades.

Cincinnati — Market is strengthened by apparent scarcity of wanted grades, which, combined with dealer reluctance to free material, is handicapping broker coverage of mill specificatians. Dealers have raised buying prices 25 cents on all grades.

St. Louis—Prices are unchanged. While no sales have been made to district mills, several transactions are reported pending. The market also is strengthened by higher prices in eastern areas.

Toronto, Ont.—There has been no abatement of interest in the iron and steel scrap markets, both melters and dealers seeking supplies to meet growing demand. Cast scrap and stove plate are in strong demand, with heavy buying reported by Toronto melters.

San Francisco—Scrap prices are unchanged and movement continues slow. The flow of scrap from outlying districts is practically at a standstill, due to low prices. No. 1 heavy melting steel, f.o.b. cars, metropolitan district of San Francisco and Los Angeles, continues to hold at $11.50 to $12 a net ton, with No. 2 at $10.50 to $11. Borings and turnings are unchanged at $5 to $5.50, with compressed sheets $9 to $9.50. No change in dealers' buying prices is reported and $8.50 to $9 a net ton on No. 1 heavy melting steel prevails.

Warehouse

Warehouse Prices, Page 95

Chicago—Business is unchanged at a rate distributors generally regard as satisfactory. No marked variation is in early prospect.

New York — To meet a highly competitive situation in galvanized sheets, subject to widespread price shading recently, leading warehouses have reduced quotations $4 or more a ton. For No. 24 gage, 150 pounds and under, 5.30c is now quoted; 150 to 1499 pounds, 4.30c; 1500 to 3499 pounds, 4.05c, and 3500 pounds and over, 3.90c. Aggregate volume with jobbers holds at least to the April rate and incoming business with some sellers is slightly ahead of last month.

Philadelphia — Distributors here have reduced galvanized sheets, No. 24 gage, approximately $5 a ton, following reductions a fortnight or so ago in hot and cold-rolled sheets and strip. They have also modified quantity classifications on galvanized sheets, with present schedules calling for 4.25c per pound on 50 bundles and over; 4.50c on lots of 10 to 49 bundles, inclusive, and 4.75c on less than 10 bundles. The 4.50c price affects the lots most comparable to those which recently took the price of 4.75c per pound.

Buffalo — Iron and steel warehouse items display a steady undertone around the level of the previous month. Munition orders were cited as the reason for a minor pickup in heavy lines.

St. Louis—Warehouses have retained the reduction of $4 a ton in sheet and strip prices, following withdrawal of this cut by mills.

Cincinnati — Sales recently have tended downward slightly. Lower prices on flat-rolled products are being maintained despite subsequent mill action.

Steel in Europe

Foreign Steel Prices, Page 95

London — (*By Cable*) — Prices of steel and iron scrap in Great Britain have been advanced 9d to 1s 6d per ton. Maximum available steel and iron output is fully absorbed by current demand. Light foundries are the only dull spot, attributed to depression in the building trades. Tin plate export trade is fair.

Belgium and Luxemburg report little change in conditions. Scan-

dinavian trade has been diverted to Britain and France. Prices are firm, the domestic markets active and works well occupied.

Nonferrous Metals

New York — Invasion of the Lowlands by German forces created turbulent trading in nonferrous metal markets. The new move threatened to reduce the flow of tin from producing centers, to increase the demand for American zinc, and to close additional outlets for export copper. There was also the possibility that spread of the war would cause ultimately a general advance in prices. Sterling exchange on Friday sold at a new all-time low of $3.05.

Copper — Custom smelters and resellers advanced the price of electrolytic to the primary mine producers' level of 11.50c, Connecticut. Casting copper rose ¼-cent to 11.12½c. Brass and bronze ingot prices rose ½-cent a pound on all grades with the exception of No. 1 yellow which rose ¼-cent. Copper sales were moderately active.

Zinc — Undertone of the market strengthened on heavier demand but the close was unchanged at 5.75c, East St. Louis.

Lead — Demand increased on Friday after moderate business earlier in the week with some sellers drawing on reserves. Prices held unchanged at 4.85c, East St. Louis.

Tin — Prices rose sharply in the domestic and London markets while holding steady in the East. Straits spot jumped to 53.50c a pound from 47.62½c. Sellers were reluctant, as they were in September, to dispose of their holdings until they could determine if the Dutch East Indies would be able to carry on operations uninterruptedly and if there would be any drastic curtailment of shipping from the East. The Far East produces about 60 per cent of the world's tin.

Antimony—No change was noted in the market here with only routine business reported at unchanged price levels.

Equipment

Chicago—Machinery and machine tool business shows improvement since the first of the month, and May has started out better than April. Inquiries have increased, large interests assert. Business is unusually well diversified. Tank makers and airplane parts manufacturers are active in the west and southwest.

Nonferrous Metal Prices

April	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
4	*11.12½	11.50	10.87½	47.37½	46.87½	5.10	4.95	5.75	19.00	14.00	35.00
6	*11.12½	11.50	10.87½	47.12½	46.75	5.00	4.85	5.75	19.00	14.00	35.00
7	*11.12½	11.50	10.87½	47.50	47.12½	5.00	4.85	5.75	19.00	14.00	35.00
8	*11.12½	11.50	10.87½	47.62½	47.12½	5.00	4.85	5.75	19.00	14.00	35.00
9	*11.00	11.50	10.87½	47.62½	47.12½	5.00	4.85	5.75	19.00	14.00	35.00
10	11.50	11.50	11.12½	53.50	53.50	5.00	4.85	5.75	19.00	14.00	35.00

*Based on sales by custom smelters; mine producers unchanged at 11.50c.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 11.50c Conn. copper

Sheets

Yellow brass (high)	18.31
Copper, hot rolled	20.12
Lead, cut to jobbers	8.25
Zinc, 100 lb. base	11.00

Tubes

High yellow brass	21.06
Seamless copper	20.62

Rods

High yellow brass	14.26
Copper, hot rolled	16.62

Anodes

Copper, untrimmed	17.37

Wire

Yellow brass (high)	18.56

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	6.87½-7.12½
Cleveland	8.00-8.25
Chicago	7.00-7.75
St. Louis	7.75-8.25

Heavy Copper and Wire

New York, No. 1	8.50-8.75
Cleveland, No. 1	9.00-9.25
Chicago, No. 1	8.50-8.75
St. Louis	8.75-9.25

Composition Brass Turnings

New York	6.50-6.75

Light Copper

New York	6.50-6.75
Cleveland	7.00-7.25
Chicago	6.50-6.75
St. Louis	6.75-7.00

Light Brass

Cleveland	4.00-4.25
Chicago	4.25-4.50
St. Louis	4.50-4.75

Lead

New York	4.50-4.75
Cleveland	3.90-4.15
Chicago	3.90-4.10
St. Louis	4.00-4.25

Zinc

New York	3.00-3.25
Cleveland	2.75-3.00
St. Louis	3.25-3.50

Aluminum

Misc., cast, Cleveland	8.00
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.00
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	12.25
Standard No. 12 aluminum	13.75-14.00

Cites Industry's Growth In Natural Gas Regions

■ More than $300,000,000 in new industrial equipment, plus employment for 85,000 new workers has resulted from influx of new industrial enterprise into, and expansion of existing industries within natural gas territories representing half the natural gas industry, according to Elmer F. Schmidt. Vice president, Lone Star Gas Co., Dallas, Tex., and chairman, American Gas association's natural gas section, Mr. Schmidt last week addressed the association's convention at Houston, Tex.

"Expanding availability of natural gas," said Mr. Schmidt, "is exerting a powerful influence upon geographic distribution of, expansion of, and employment of labor by American industry." Approximately 2000 new plants, he continued, and 2400 significant expansions of existing plants have been made since 1934 in the 55 per cent of the natural gas supplied territories covered by reports received.

Bopp Steel Co. To Expand Dearborn Plant

■ Contracts for design and construction of a 28,000-square foot addition to the Bopp Steel Co.'s plant at 7951 Maple street, Dearborn, Mich., have been awarded to the Austin Co., Cleveland.

Increased demands upon its facilities for cold rolling of strip steel for automotive and kindred industries are responsible for the expansion which will involve the investment of approximately $100,000. It will include extensions of the pickling and annealing buildings and construction of a mill building addition 105 x 160 feet.

Detroit Stamping Co. Starts New Plant

■ Construction of a complete new plant for the Detroit Stamping Co. on Midland avenue, Highland Park, Mich., is to be started this week by the Austin Co., Cleveland, who designed the structure. It is scheduled for completion early this summer.

The building will represent an investment of $80,000 and will have an area of approximately 35,000 square feet. Plant will be of welded steel and face brick construction.

Westinghouse 1939 Taxes Average $238 Per Employe

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., last week reported to its employes they had "worked six weeks for the tax collector in 1939."

Distributed to each employe, the statement pointed out Westinghouse's tax bill had increased from $2,532,000 in 1930 to $10,390,000 in 1939. Based on tax bill's relation to average wage or salary paid employes, 1939 taxes totaled $238 for each employe, compared to $55 in 1930.

Highest aggregate tax bill was in 1937, when $14,046,000 was accrued; this was equal to $269 per employe. Tax bill in 1936 was $8,946,000, equal to $215 per employe; in 1938, $7,095,000 or $167 per employe.

Tinnerman Products Inc. To Build Plant Addition

■ Addition of 12,000 square feet of floor space to its factory facilities, to cost $100,000, was announced last week by Tinnerman Products Inc., Cleveland. The new two-story brick and steel building represents the third addition, making a total of over 40,000 square feet of factory space the company has added since 1937.

Cleveland Observatory Will Be Enlarged

■ A $75,000 contract for construction of an addition to the Warner and Swasey observatory, Case School of Applied Science, Cleveland, has been awarded to The Gillmore - Carmichael - Olson Co., Cleveland. Contract provides for the construction of the Warner memorial auditorium, a central exhibition hall, the supporting piers for the new 36-inch reflector telescope, and other incidental parts of the building, together with the re-arrangement of the grounds, including driveway and walks.

Purchase Terre Haute Iron and Steel Mill

■ New ownership of the Highland Iron and Steel mill, Terre Haute, Ind., became effective May 8. The plant, which had been owned and operated for 19 years by American Chain & Cable Co. Inc., was being considered for sale or dismantling, but was purchased by Highland Iron & Steel Inc. with the aid of the chamber of commerce and public-spirited Terre Haute residents.

Active management, including sales, purchasing and plant operations will be carried on by the same employes as under the previous ownership.

Scrap Institute To Meet In Buffalo June 22-23

■ Institute of Scrap Iron and Steel Inc., New York, will hold its mid-year meeting July 22-23 at the Hotel Statler, Buffalo. Business sessions will be held both mornings, with a sightseeing trip around Buffalo and to Niagara Falls scheduled for the first afternoon, and the annual golf tournament the second afternoon. Nathan H. Jacobs, Buffalo House Wrecking & Salvage Co., president of the western New York chapter, is general chairman of the convention committee.

Machine Tool Show To Be Held in Detroit in 1941

■ Annual Machine & Tool Progress exhibition for 1941 will be held in Detroit, March 24-29, 1941, in conjunction with the annual convention of the sponsoring organization, the American Society of Tool Engineers. Exhibits will be at convention hall. Ford H. Lamb, 2567 West Grand boulevard, Detroit, is executive secretary.

Stow Mfg. Co. Inc., Binghamton, N. Y., has acquired rights to manufacture and sell Whirlflex, a mechanical cleaner for piping in paper mills, from Whirlflex Co., Buffalo, which holds all patents to the device.

Construction and Enterprise

Ohio

CLEVELAND—Industrial Machine Co., 1432 East Forty-seventh street, has let contract to J. L. Hunting Co., Ninth-Chester building, for a plant addition to cost $8000.

CLEVELAND—Edward G. Hoefler, 5005 Euclid avenue, engineer, is in charge of plans for a factory building 60 x 200 feet on Lakeside avenue for undisclosed client. Plant will be brick and steel, will include five-ton crane and cost about $25,000.

CLEVELAND—Wedge Wire Corp. has been formed by officials of Air-Maze Corp., 5200 Harvard avenue, and is manufacturing in a small way a new type of grill for coal washing, covered by an English patent for which the company has American rights. Additional space of new plant is planned when demand has been increased.

CLEVELAND—American Tank & Fabricating Co., 2284 Scranton road, has been organized to manufacture stacks, tanks, breeching and similar articles. Plant with 20,000 square feet floor space has been taken. John J. Ripich is president.

CLEVELAND—Radiart Corp., 13229 Shaw avenue, manufacturer of small electric equipment and auto radio set equipment, L. K. Wildberg, president, will move Sept. 1 to new quarters at Barberton avenue and West Sixty-second street, to occupy a plant with 35,000 square feet floor space.

CLEVELAND—Austin Co., 16112 Euclid avenue, has been awarded contract by Vickers Inc., 1400 Oakman boulevard, Detroit, for a plant addition to cost about $500,000. Company manufactures hydraulic controls and other equipment for aircraft and machine tool industries.

KENTON, O.—Kroger Grocery & Baking Co. has purchased 102 acres near Kenton and is considering erection of canning plant here. William Campbell, Cincinnati, vice president of the Kroger Co. is in charge.

PIQUA, O.—Jackson Steel Tube Co., Rodney street and Kent avenue, Brooklyn, N. Y., Samuel E. Jackson, president, has bought part of the former plant of Favorite Stove & Range Co. and will establish a plant for production of steel tubing for bicycle frames, furniture and similar purposes. Building is 140 x 300 feet. New equipment will be installed.

Connecticut

HARTFORD, CONN.—Connecticut Mutual Insurance Co., Hartford, will build an addition to its office building. Structural steel contract has been let to Harris Structural Steel Co., New York.

NORWALK, CONN.—Superior Castings Co. has let contract to Hewlett Construction Co., 1385 Iranistan avenue, for construction of plant on Meadow street, 74 x 210 feet, with wing 20 x 27 feet. Plans by Leo F. Caproni, New Haven, Conn.

New York

CAMILLUS, N. Y.—Camillus Cutlery Co. will build an addition to cost about $40,000.

ELMIRA, N. Y.—Thatcher Mfg. Co., Kingsbury avenue, is rebuilding two furnaces, construction of which has been let to Wellman Engineering Co., 7000 Central avenue, Cleveland.

FAIRPORT, N. Y.—American Can Co., 230 Park place, New York, has let contract to John T. Adams Co. Inc., 30 Rockefeller Plaza, New York, for a warehouse to cost about $100,000.

FARMINGDALE, N. Y.—Ranger Engineering Corp., is building an additional plant building. Structural steel has been let to Belmont Iron Works, Philadelphia.

SCHENECTADY, N. Y.—City plans caisson well and pumping station, to cost about $370,000. M. Pirnie, 25 West Forty-third street, New York, is engineer.

Pennsylvania

LOCK HAVEN, PA.—Pennsylvania Woven Wire Co., J. W. Dickey, plant manager, will build a 1-story plant, 25 x 60 feet, to cost about $40,000.

PHILADELPHIA—City has voted $18,000,000 loan for waterworks rehabilitation. Morris Knowles Inc., Westinghouse building, is engineer. (Noted April 1.)

PITTSBURGH—Philadelphia Coke Co., 4501 Richmond street, Philadelphia, has let contract to Koppers Co., engineering and construction division, Koppers building, Pittsburgh, for a plant for production of light oils and motor fuel.

ROCKAWAY, PA.—Rockaway Glass Co., R. L. Warren, president, Beadle building, will build a 1, 2 and 3-story plant, 110 x 622 feet, costing about $500,000. Frazier-Simplex Inc., 436 East Beau street, Washington, Pa., is engineer.

Michigan

DETROIT—Michigan Chrome Co. has given general contract to W. J. C. Kaufmann Co. for construction of a plant in Detroit.

DETROIT—Albert Kahn Inc., Detroit, architect and engineer, is preparing plans for a plant building 400 x 1000 feet, on Oakland boulevard, Highland Park, Mich., for the Chrysler Corp.

DETROIT—Lincoln Brass Works, Detroit, will build an addition to its plant on Twelfth street, 95 x 105 feet. E. B. Arnold, Detroit, is architect.

DETROIT—Perry Curley Sales Corp. has been incorporated to deal in machinery and tools, with capital of $50,000, by Leo T. Curley, 5045 Trumbull avenue, Detroit.

MT. PLEASANT, MICH.—Essex Refining Co., E. E. Brehm, manager, recently incorporated, is having plans made for an oil refinery on Saginaw river, north of Essexville, Mich.

Alabama

MOBILE, ALA.—Alabama Dry Dock & Shipbuilding Co., D. R. Dunlap, president, will extend shipways 150 feet at Pinto Island plant, to accommodate building of larger vessels. Cost will be about $45,000.

WENONAH, ALA. — Tennessee Coal, Iron & Railroad Co., Brown Marx build-

ing, Birmingham, Ala., will build a 1-story chemical laboratory and office building 31 x 81 feet.

Maryland

BALTIMORE—Rustless Iron and Steel Co., 2400 East Chase street, will build a melting department at cost of about $600,000.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids as follows: May 21, schedule 1458, motor-driven straight bevel gear generator for Washington navy yard; May 24, schedule 1578, motor-driven milling machine for San Diego, Calif.; May 24, schedule 1590, three diesel engine-driven crane tractors, various deliveries; May 24, schedule 1599, planer and jointer machine and motor-driven circular and band saw, various deliveries.

Wisconsin

MARSHFIELD, WIS.—City will take bids soon for 1-story power plant addition 40 x 100 feet to house turbine and other equipment, including 25-ton traveling crane, total cost about $100,000. E. F. Kipp is superintendent of electric department. Helmick, Edeskuty & Lutz, Essex building, Minneapolis, are engineers.

Minnesota

COKATO, MINN.—Bonds for $90,000 have been approved for sewage disposal plant. A. M. Anderson is city clerk.

HOPKINS, MINN.—Minneapolis-Moline Power Implement Co., Minneapolis, will rebuild burned harvest machinery assembly shop and tin shop at plant here. Much ruined machinery equipment must be replaced.

KEEWATIN, MINN.—Bond issue for $32,000 has been approved for construction of a sewage disposal plant. John Rebrovich is village clerk.

LITTLE FALLS, MINN.—City council, Otto L. Plettl, clerk, has ordered survey for sewage disposal plant to cost about $250,000. Arthur R. Marquardt is city engineer.

MANKATO, MINN.—Automatic Electric Mfg. Co., J. Fred Krost, president, has given contract to A. R. Kleinschmidt Construction Co. for 1-story plant on State street for manufacture of time switches, interval timers and flashers.

MINNEAPOLIS—Chicago, Milwaukee, St. Paul & Pacific railroad will make improvements to shops here at cost of $150,000, including enlargement of locomotive machine shop, addition of large boring mill, replacing transfer table and changes to facilitate heavy repairs to new types of locomotives.

ST. PAUL—Northern States Power Co., 15 South Fifth street, Minneapolis, plans construction of 67,000-horsepower steam generating plant.

STILLWATER, MINN.—Stillwater Plowshare Co. has been incorporated to manufacture plowshares, plowpoints and similar products by W. E. Rumble, E. A. Vaughan and associates.

Kansas

CHANUTE, KANS. — City, Ralph Reeves, city engineer, plans addition to sewage disposal plant to cost about $100,000, to meet requirements of state health board.

LARNED, KANS.—City, C. L. Frizzell, mayor, is taking bids for two steam generating units, including boilers, settings, superheaters and other equipment. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

Iowa

BROOKLYN, IOWA — City, Jennie Schmitz, clerk will hold election May 23 on proposal to purchase electric distribution system now in city, as part of plan to construct municipal light plant. Total cost will be about $135,000. Stanley Engineering Co., Muscatine, Iowa, is consulting engineer.

CRESCO, IOWA—Air-Turbine Mfg. Co. has been incorporated to manufacture air-turbines for gasoline motors, by J. E. McKitrick and Roy W. Frank.

SIOUX CITY, IOWA—Rocklin Mfg. Co. has been incorporated to manufacture tractor saws and other machinery, by I. J. and R. A. Rocklin.

WATERLOO, IOWA—Iowa Public Service Co., H. M. Smith, assistant general manager, will build a cylinder gasholder, 110 feet high, 40 feet in diameter, to cost about $40,000.

Montana

MISSOULA, MONT.—Findell Lumber Co., E. A. Findell, president, will rebuild sawmill and power plant recently burned, with loss of $175,000.

California

LOS ANGELES—United Steel Products Corp. has been organized with $25,000 capital, represented by Friedman & Katzev, 416 West Eighth street, Los Angeles.

LOS ANGELES—Southern California Edison Co. Ltd., Los Angeles, has given contract to Stone & Webster Engineering Corp., New York, for construction of 220-kilovolt steel tower transmission line from Boulder dam to Los Angeles and interconnecting lines to a total of 335 miles; also includes new switching station and additions to substations.

Washington

SEATTLE—Preservative Paint Co., 5410 Airport way, Frank West, president, has awarded contract to H. E. Carlbom for boilerhouse and steam plant. Additional tanks and stills will be installed later.

VANCOUVER, WASH.—Vancouver Plywood & Veneer Co., John Powell, manager, is preparing to install 1500-kw. generator and steam turbine.

WALLA WALLA, WASH.—Continental Can Co. is having plans prepared for a can manufacturing plant here.

Canada

HAMILTON, ONT.—Steel Co. of Canada Ltd., is installing a universal plate mill and tin plate dipping plant here at cost of about $6,000,000.

HAMILTON, ONT.—Canadian Westinghouse Co. Ltd., 286 Sanford avenue North, is building plant addition on Aberdeen avenue. Pigott Construction Co. Ltd., 36 James street South, is general contractor.

PORCUPINE, ONT.—Broulan Porcupine Mines Ltd., 372 Bay street, Toronto, Ont., will build 300-ton mill unit here. General Engineering Co. of Canada Ltd., 100 Adelaide street West, Toronto, is engineer.

SAULT STE. MARIE, ONT.—Public utilities commission, Queen street East, W. M. Cornell, manager, is taking bids for a substation costing $40,000 at Wellington and Church streets.

TORONTO, ONT.—John T. Hepburn Ltd., 18 Van Horne street, structural steel fabricator, is having plans prepared for a $20,000 addition to plant on Van Geary avenue.

MONTREAL, QUE. — Kennedy Construction Co. has been awarded contract for $150,000 superstructure for a section of Canadian National Railways' terminal viaduct here.

NORANDA, QUE.—Powell Rouyn Gold Mines Ltd., 617 Confederation Life building, Toronto, Ont., is having plans made by J. C. Rogers for milling plant to cost $260,000.

CLASSIFIED

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Where-to-Buy Products Index carried in first issue of month.

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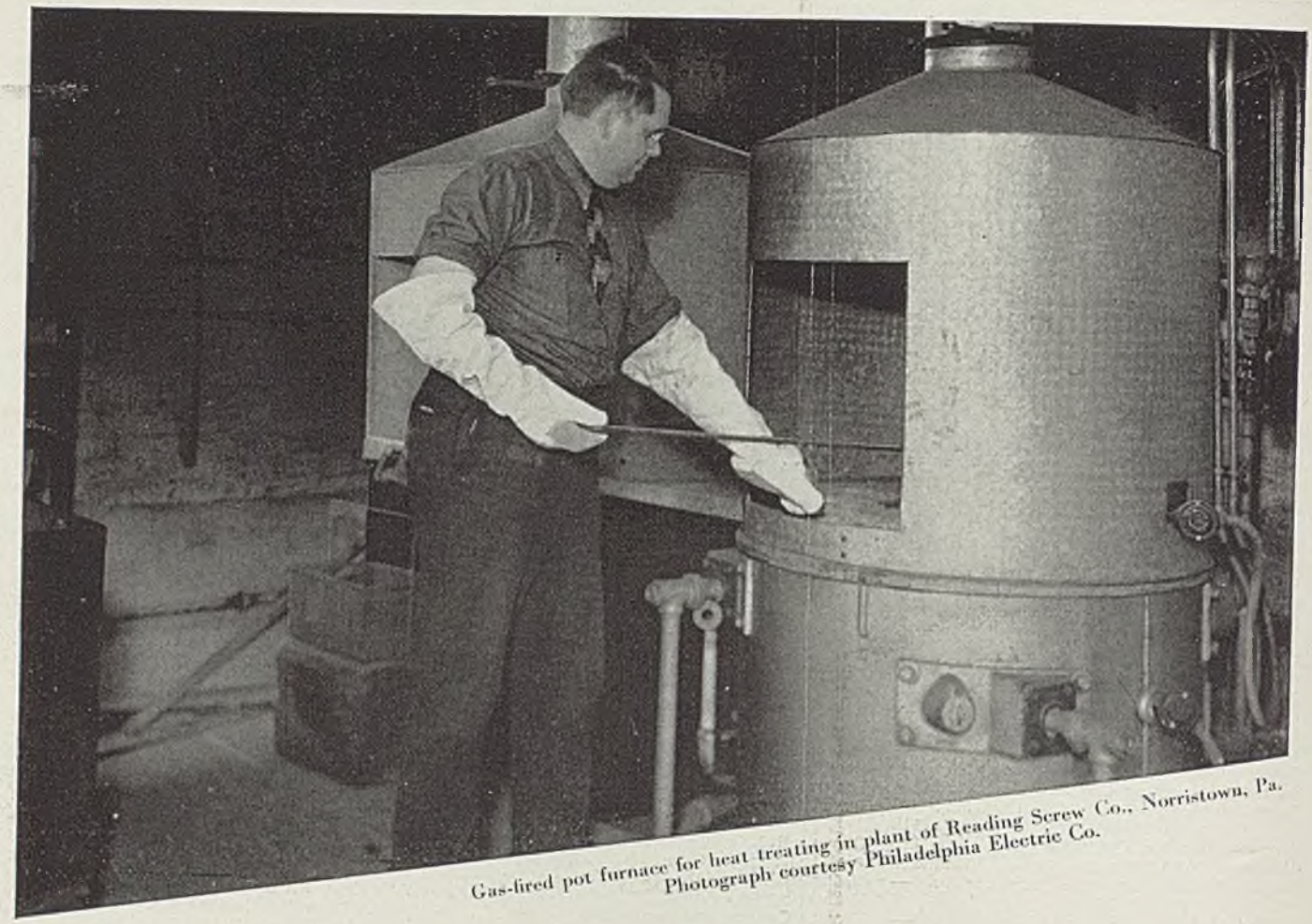

Gas-fired pot furnace for heat treating in plant of Reading Screw Co., Norristown, Pa.
Photograph courtesy Philadelphia Electric Co.

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