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STEEL

ESTABLISHED 1882



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PRODUCTION • PROCESSING • DISTRIBUTION • USE

November 18, 1940

Did you pay him for Production or Overhead?

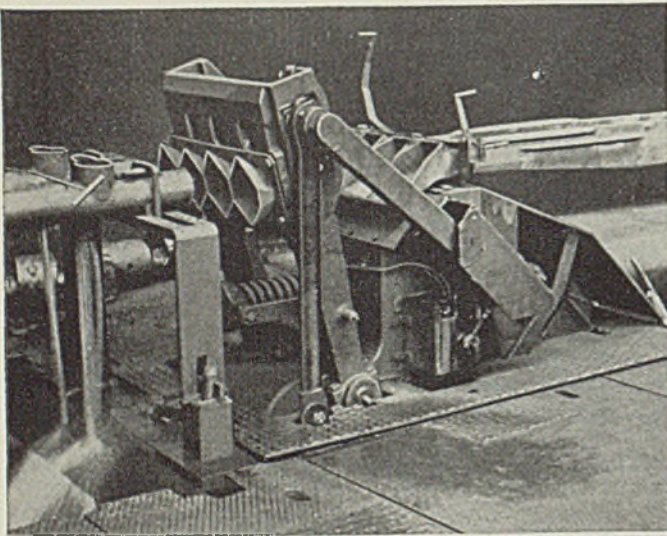


Eight hours have passed. Eight hours of wages, steel, power -- a mounting tide of costs that crowds on the heels of output.

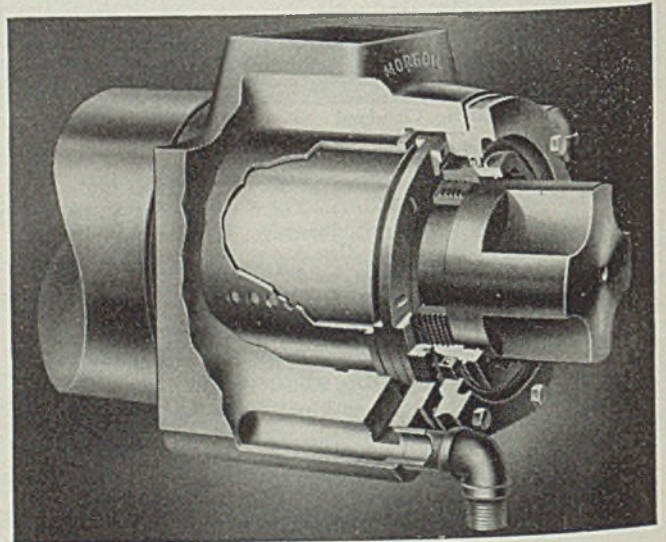
"Bottle Necks," by slowing down the even flow of output, cut into profits -- switch wages from production to overhead. So, it pays to eliminate the bottle necks, many of which can be removed without heavy investment or delay.

Ask for a Morgan Report.

R-78



The Flying Shear, first introduced by Morgan, has been developed to its present size and high degree of perfection, permitting new production peaks in continuous mills.



Morgoil Bearings ride on a film of oil. They cannot be equalled for low coefficient of friction, high load capacity, and freedom from wear. Available in all sizes and capacities for replacement.



CONTINUOUS ROLLING MILLS
 Rod • Strip • Skelp • Merchant Shapes
 MORGAN CONSTRUCTION COMPANY, WORCESTER, MASSACHUSETTS

STEEL

HIGHLIGHTING THIS ISSUE

■ THE RATE of steel production fell off half a point last week (p. 25) to 96 per cent of ingot capacity. This resulted from the need for furnace repairs and from a strike at Pittsburgh. Demand continues to gain (p. 103) and deliveries continue to fall a little further behind. Major efforts of steel company sales departments are aimed at apportioning the supply of steel equitably. With employment and purchasing power improved, demand for ordinary peacetime products, as automobiles, radios, refrigerators and the like, is growing. . . . A leading southern steelmaker (p.25) will expand its coke and pig iron capacity and will add to other facilities.

. . .

"When this rearmament effort is over . . . our economy should not find itself in the condition in which it was in the early twenties when we had over-expanded our industrial plant without giving due consideration to permanent civilian requirements," Donald M. Nelson (p. 31) said in a defense commission conference last week. Various signs indicate the government will try to prevent chaos when the defense program tapers off. . . . Machinery is being set up to encourage the financing of defense activities (p. 31) through local banks. . . . Dr. Harry A. Millis, General Motors grievance umpire, has been nominated (p. 23) as a member of the national labor relations board.

No Chaos Later

Supreme Court's decision in the Republic case (p. 31) is hailed (p.21) as definitely outlawing the blacklisting of companies on defense work as a result of labor board charges not proven in court. . . . Unless the President sets up a nonpolitical, bipartisan defense labor board, warns Edmund M. Toland (p. 21), bias and prejudice will continue to hamper the defense program. . . . Alfred P. Sloan Jr. recommends lengthen-

Handled With Gloves

ing of the work-week and (p. 24) suspending overtime penalties. . . . Higher taxes are to be imposed (p. 29) early next year. . . . Now functioning (p. 32) is a machine tool priorities committee. . . . Since the election, says John D. Knox (p. 33), some steel plant workers feel cocky and must be handled with gloves.

. . .

K. W. Atkins (p. 46) describes a new tooth design for metal-cutting saws. It peels the chips into tight coils which, like wound-up clock springs, are under tension. The coil is free to uncoil and does so when the tooth emerges from the kerf, thus clearing the tooth completely for the succeeding cut. Blade performance is increased greatly. . . . With a new rod it is possible to join aluminum and its alloys (p. 57) without using flux. . . . J. E. Sams (p. 60) describes a new stretch test for measuring the attachment of porcelain enamel to sheets. The test results are immune to gage variations and correlate closely with impact and microscopic test values through a wide range.

New Tooth For Saws

. . .

Charles Hart describes (p. 66) the production of pig iron in electric furnaces. The subject is of unusual interest at this time because of the increasing amount of low-cost power that is becoming available. . . . A materials handling system (p. 72) is the heart of a new automobile radiator plant which produces 6000 units daily; fourteen separate conveyor systems are in use. . . . R. D. Wearne (p. 76) discusses some factors to be considered in hiring men to be trained as machine operators. . . . Much new and improved equipment is available (p. 80) for production lines. . . . A new dye for concrete (p. 95) is alkali-proof. . . . Standard shot and grit (p. 97) now are controlled as to toughness and hardness.

Pig Iron Process

British ADVERTISE LEDLOY

The new leaded steel
developed by INLAND

NOTE: Inland has licensed
many steel makers in America
and abroad to make this product
under its patents.

**Bevin Urges Cut
in Factory Hours
WORKERS FEELING STRAIN OF
PRESENT LONG SPELLS**

MILLIONS of war workers who for the last three months have been working a seven-day 70- to 80-hour week are to have their hour

By IAN MACKAY

Extract from "Next Chronicle" of July 30th, 1940

**NO NEED FOR STRAIN
NO NEED FOR OVERTIME**

LEDLOY STEELS

**DOUBLE THE OUTPUT
WITHOUT OVERTIME**

LEDLOY STEELS, because they machine so much more easily than other steels, INCREASE OUTPUT BY 100% (or more).

LEDLOY STEELS, because they reduce heat and friction, INCREASE CUTTING TOOL LIFE BY MORE THAN 200%.

When every minute is vital, when every worker must increase output, manufacturers working on essential supplies should know of the new steel LEDLOY (officially approved).

LEDLOY is the name given to steels into which a small percentage of lead has been introduced by a special process. Ledloy Ltd., 66 Cannon Street, London, E.C.4, will supply technical information on request.

FOR THE NATIONAL EFFORT DEMAND

LEDLOY STEELS

FROM YOUR REGULAR SUPPLIER

Structurals · Rails · Track Accessories · Reinforcing

Sheets · Strip · Tin Plate · Bars · Plates · Floor Plates · Piling

INLAND STEEL CO.

National Founders Hear Plea For Defense Labor Board

Administration of Wagner Act by NLRB Scored.

Unity Between Labor, Industry Necessary to Rearming.

Group Pledges Co-operation for Defense, Not Offense.

Close Watch on Federal Tax Legislation Advised.

■ CO-OPERATION with the government in the execution of a national defense program was pledged by members of the National Founders association at the forty-fourth annual convention at the Waldorf-Astoria hotel, New York, last week.

The founders' resolution, however, warned against confusing national defense with national offense and went on record for keeping the United States out of foreign wars.

Another resolution deplored the administration of the national labor relations act as revealed by the special house investigating committee. "The successful carrying out of the defense program," resolved the founders, "depends upon national unity of labor and industry, and we urge the administrative council to use every means in its power to the end that this association, in co-operation with other associations, urge upon congress a change in the personnel of the national labor relations board so as to insure an impartial administration of the act and to restore the confidence of both labor and industry."

A considerable portion of the convention program was devoted to labor problems.

While deploring the trend of many recent court rulings, James A. Emery, general counsel, National Association of Manufacturers, said the recent United States Supreme Court decision in the Republic Steel Corp. case was salutary in many of its effects.

The Supreme Court decision (see page 31), which ruled Republic did not have to repay PWA for work

relief wages paid to the company strikers, is remedial in character and not penal, he declared. It definitely outlaws, in his opinion, "mandatory blacklisting" of companies on defense work, due to charges by the board, not even proved in court, that they have been violating the Wagner law.

As a solution to many labor problems in the critical period of rearming, Edmund M. Toland, Washington, formerly general counsel to the congressional committee investigating the national labor relations board, suggested a body similar to the war labor board in the World war.

"If the President by executive order were to create under his emergency power a bipartisan non-

political defense labor board with jurisdiction over industries vital to national defense; if the personnel of such board were to parallel the old war labor board; if such a board were to administer concurrently the various labor problems now spread throughout a number of various agencies, then some measure of order, some measure of unity might prevail, and our national defense program might go forward unimpeded by labor disturbances.

"Such a board of competent and unbiased personnel would restore the faith of the people in the government's ability to administer the field of labor relations, a faith which looks askance at the sight of the labor member (Sidney Hillman) of the advisory commission of the national defense council, drawing an annual salary as president of a union affiliated with the CIO and serving as vice president of the latter organization, while his industrial colleagues have divorced themselves from all industrial positions."

The greatest problem with which such a board would have to deal would be the strike. But, he said, without prohibiting labor the right to strike, the right would be preserved and, at the same time, the threat to the defense program in the strike could be minimized by requiring notice of intent to strike and then requiring a cooling period.

The labor advisory committee, Mr. Toland remarked pointedly, is now composed of six representatives of the AFL, six of the CIO and four representatives of the Brotherhood of Railway Trainmen.

"If this situation is allowed to



W. D. Hamerstadt

Re-elected president, National Founders' association

continue, without industry having equal representation and a clarification of the labor defense policy of this administration, the same strife and discord that we have had as a result of the acts of the biased and prejudiced personnel of the national labor relations board will continue and will hamper and interfere with our defense program," the speaker concluded.

W. D. Hamerstadt, Rockwood Mfg. Co., Indianapolis, who was re-elected president of the association, devoted his remarks largely to a review of the history of the organization, emphasizing particularly its accomplishments in the labor relations field, safety work and in the promotion of sound foundry management and practice.

Speaking particularly of labor relations, he said: "Many feel they are helpless in this field; that the numerous restrictions imposed by law have made it impossible for them to carry out any of their own judgments. We hope these restrictions will be modified so as to make the laws and regulations fairer and more workable. However, the fundamentals of the labor problem remain the same—wages, hours and working conditions equitable to both management and the employes."

Pointing out that it is usual for this country to be behind in its defense preparations, Mr. Emery said that upon this occasion the United States is in far worse position financially than at the time of the

World war, due particularly to the wasteful spending of the past seven and a half years. This will mean especially heavy taxation to meet defense burdens. Consequently, he said, it behooved all to watch tax legislation closely, that such may be as effective as possible and be confined to legitimate needs.

He said that it is high time for a re-examination of the whole system of taxation, and he foresaw the day, judging from the present trend, when there will be a sharp conflict between local and federal governments over questions of taxation, which will prove greatly detrimental to the country.

Most Orders Placed

So far as present appropriations are concerned the order-placing phase of the defense program is nearing the end, according to Harry L. Coe, technical advisor, National Association of Manufacturers.

Changes in the personnel of the advisory commission, with some present members returning to private business, were predicted. Mr. Coe believes their places will probably be filled with appointees more in sympathy with the administration's economic and social policies. The impression prevails the Hillman-Henderson influence will increase. Even in the current group votes are often split, five to two.

Substantial part of the three billions remaining for national defense is rather definitely allocated and the next few weeks will witness the

rounding out of the program. Next general activity will be in connection with production of required materials and every industry, directly or indirectly, will feel the guiding hand of government more or less forcibly applied, said Mr. Coe.

Priorities will be extended, not only to divert materials and labor into defense industries, but also to insure necessary production for civilian requirements. On many commodities not now so regulated, export and import licenses may be expected and government financing in various forms will become more general. Mr. Coe also feels facilities for recruiting labor will be largely government controlled and increases in basic wage scales may be expected with governmental support.

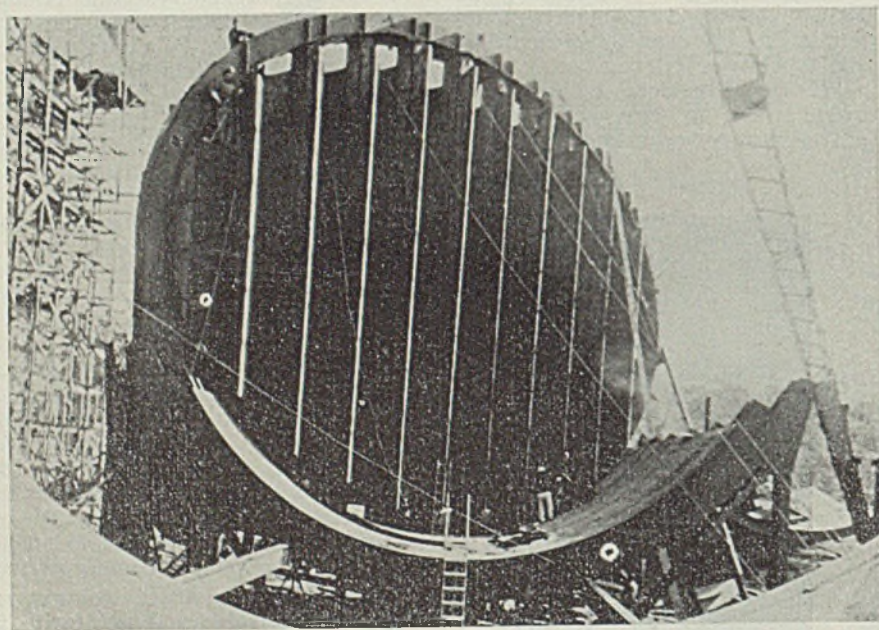
With government blessing, a drive for organizing all open shops is already in the making, he said, and recent attempts to use defense contracts as a club for forcing compliance with labor board decisions is an indication of what may be expected. In the background also is the threat of commandeering and governmental operation of industry.

Price control will discourage increases which might temporarily offset additional cost of production and heavier taxation will still further reduce recoverable profit. Industry's one hope, according to Mr. Coe, is to demonstrate industry will be able to carry out the program under private management better than under any other system. He stressed the importance of becoming familiar with continually changing conditions under rules and regulations promulgated by congress, the President and other governmental agencies, including the treasury.

To date the operation of priorities has been by voluntary co-operation and, according to Mr. Coe, the stronger trade associations have been of great assistance. Machine tools presented first serious problem, but in almost every case the priorities committees of the army and navy have succeeded in working out a satisfactory adjustment without employing mandatory authority. As the full impact of large orders begins to filter down through industry, the situation will undoubtedly become worse. Mr. Coe declared the priorities committee of the advisory committee is endeavoring to guide this policy with intelligence and foresight.

It is becoming more evident daily that if industry is to even approach satisfactory production, reserve capacity of the smaller manufacturers must be drawn into the program. It is no longer possible to expand manufacturing facilities through large purchases of machine tools,

Steel Fin for Aircraft-Testing Wind Tunnel



■ This huge vertical fin structure, framed in a semicircle of sheet steel, is to be installed in the new Wright field wind tunnel at Dayton, O., to direct flow of air where the tube makes a turn in direction. Tube's maximum diameter will be 40 feet, test chamber's, 20 feet. It will be large enough to test plane models with wing spreads up to 15 feet at wind speeds to 400 miles per hour. NEA photo

output for that industry being already largely scheduled for next year. The solution is to fully utilize equipment now installed in the thousands of smaller shops.

Mr. Coe explained in detail the various amortization plans available to smaller plants. There will be many instances in which manufacturers serve as subcontractors, or supplying items necessary for national defense without appearing as direct contractors on government orders. In such cases a manufacturer is entitled to "certificates of necessity," and if additional facilities are required, may take advantage of the accelerated amortization features for the reduction of taxes. In such cases, Mr. Coe suggested the desirability of obtaining in addition a "certificate of non-reimbursement" as this establishes facts in the case and prevents complications when income tax returns are reviewed by the department of internal revenue.

Reviews Foundry Practices

Gotfrid Olson, foundry engineer, National Founders association, reviewed developments, methods and practices in the foundry industry, basing his remarks on a series of surveys conducted at numerous foundries at which production problems were encountered. Citing advances made by the industry, Mr. Olson compared wall thicknesses, complicated design and intricate core work of such castings as the air brake cylinder, aircraft cylinder, automobile V-block with the foundry product of 25 years back. He noted also more exacting specifications by the ordnance department covering shells of 6, 8, 10 and 12-inch diameter. A tensile strength of 50,000 pounds is now required compared with 28,000 pounds in 1910.

Need of skilled mechanics and the importance of time in the training of apprentices in connection with the defense program was stressed by William F. Patterson, chief of apprenticeship, United States department of labor.

Merryle Stanley Rukeyser, economic commentator for the Hearst newspapers, advised a long view of the industrial picture based on possible permanent changes in the economic structure three or four years hence rather than the short range outlook now stimulated by the defense program. Emotional economics are too prevalent. The defense program has already revised industrial psychology as evidenced by the trend toward building up inventories. The hysteria as to possible shortages is not warranted, according to Mr. Rukeyser. The tax burden has not been reflected in prices or earnings as yet, but will be as defense orders

materialize. Industry should resist inflation at all costs. If business goes the easiest way as to wages and costs, prices will get out of hand, he said, urging against cost increases wherever possible.

E. L. Berry, assistant general manager, Link-Belt Co., Chicago, presented an interesting discussion of "Practical Industrial Management." While there are many definitions of scientific management, Mr. Berry believes that it may be described as an attack on conditions that are susceptible of exact formulation. He pointed out that it is a function of management to plan procedures and to follow through to see that the procedures or standards are applied to the plant.

Such incentive systems will be only as good as the honesty and common understanding of the company and the men participating in it, according to Mr. Berry. The men must have the proper understanding of just what such incentive schedules in the plant are all about if such schedules are to work properly. Just as the worker must have tools to perform his tasks, management must have tools, and the most important in this instance is observation.

All officers of the association were re-elected. In addition to President Hamerstadt, these include: D. C. Bakewell, Blaw-Knox Co., Pittsburgh, vice president; J. M. Taylor, Chicago, secretary-treasurer; and A. E. McClintock, commissioner. District committees:

First district, the New England states:

Chairman, G. R. Holmes, The McLagon Foundry Co., New Haven, Conn.; vice chairman, H. B. Johnson Jr., General Fire Extinguisher Co., Providence, R. I.; R. F. Harrington, Hunt-Spiller Mfg. Co., Boston; Franklin Farrel III, Farrel-Birmingham Co., Ansonia, Conn.; A. M. Cottrell, C. B. Cottrell & Sons Co., Westerly, R. I.

Second district, New York and that part of New Jersey north of a line drawn from Lambertville to Point Pleasant, and the Provinces of Ontario and Quebec in the Dominion of Canada: Chairman, Irving L. Jones, International Heater Co., Utica, N. Y.; vice chairman, P. R. Van Duyn, Meeker Foundry Co., Newark, N. J.; Hamilton Garnsey Jr., Goulds Pumps Inc., Seneca Falls, N. Y.; C. P. Clark, Clark Bros. Co., Olean, N. Y.; J. H. Hornung, Otis Elevator Co., Yonkers, N. Y.

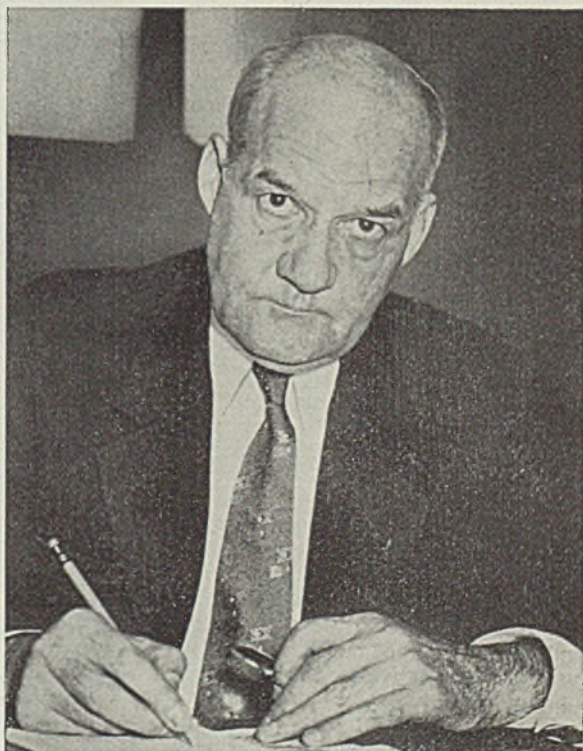
Third district, Pennsylvania, Delaware, Maryland, District of Columbia, and that part of New Jersey south of a line drawn from Lambertville to Point Pleasant and including these two towns: Chairman James H. Anderson, The Cooper-Bessemer Corp., Grove City, Pa.; vice chairman, G. L. Coppage, The Pusey & Jones Corp., Wilmington, Del.; George R. Casey, Treadwell Engineering Co., Easton, Pa.; S. P. Hazard, R. D. Wood Co., Florence Pipe Foundry & Machine Co., Philadelphia; E. C. Moore, Erie City Iron Works, Erie, Pa.

Fourth district, the lower peninsula of Michigan, Ohio, Kentucky, Indiana and West Virginia: Chairman, M. W. Manz, The Ohio Brass Co., Mansfield, O.; vice chairman, George Cannon, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.; R. W. Gillisple, The Jeffrey Mfg. Co., Columbus, O.; I. R. Wagner, Electric Steel Castings Co., Indianapolis; John M. Price, Ferro Machine & Foundry Co., Cleveland.

Fifth district, Illinois, Missouri, Oklahoma, Nebraska and Iowa: Chairman, A. H. Head, John Deere Tractor Co., Waterloo, Iowa; vice chairman, C. B. Magrath, Greenlee Foundry Co., Chicago; E. L. Berry, Link-Belt Co., Chicago; J. F. Culver, Century Electric Co., St.

Named to Labor Board

■ Appointment of Dr. Harry A. Millis as a member of the national labor relations board is expected to result in a long overdue revamping of the board's staff. Dr. Millis' views are understood to be akin to those of Dr. William Leiserson, who has stated publicly his opinion that many of the board's attaches are unfit for their positions. Dr. Millis, for many years a University of Chicago professor, and a veteran labor dispute arbiter, will succeed J. Warren Madden whose term expired. NEA photo



Louis; Ira G. Whitney, A. Y. McDonald Mfg. Co., Dubuque, Ia.

Sixth district, Wisconsin, Minnesota, upper peninsula of Michigan, North Dakota, South Dakota and the province of Manitoba in Canada: Chairman, C. F. Wehr, Wehr Steel Co., Milwaukee; vice chairman, William J. Grede, Spring City Foundry Co., Waukesha, Wis.; F. H. Clausen, Van Brunt Mfg. Co., Horicon, Wis.; H. O. Menk, The Harnischfeger Corp., Milwaukee.

Seventh district, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Texas and Tennessee: Chairman, G. E. Jones, U. S. Pipe & Foundry Co., Bessemer, Ala.; vice chairman, Fosskett Brown, Gray & Dudley Co., Nashville, Tenn.; John D. Capron, Glamorgan Pipe & Foundry Co., Lynchburg, Va.; W. C. Trout, Lufkin Foundry & Machine Co., Lufkin, Tex.; Warren Whitney, James B. Clow & Sons, Birmingham, Ala.

It leads to endless controversies. . . . Experience demonstrates that once the vicious spiral is under way is it almost impossible to check.

"Probably the wage rate presents the greatest danger and the one hardest to control. The principle is sound that the defense program should not be made the occasion for increases in wage rates that cannot, generally speaking, be justified. . . . Only when living costs increase as a result of the disturbance of the primary price level should wage rates be adjusted to protect living standards."

"Most Striking Economic Danger Today Is Inflation"—Sloan

■ "KEYSTONE of our defense of the American way of living today, tomorrow and always, in the world now existing, is the strongest, the most virile, the most aggressive economy that the creative genius of America can devise." This was the message delivered by Alfred P. Sloan Jr., chairman, General Motors Corp., before the annual meeting, Academy of Political Science, Hotel Astor, New York, Nov. 13.

Such an economy, said Mr. Sloan, finds its strength in the productive power of its industry, its plant, its equipment, its workers—especially its technicians and management—all supported by the material resources which enable it to develop the necessities of defense as well as the needs of peace.

"I can conceive of a weak defense based upon a strong economy. I cannot conceive of a strong and competitive defense based upon a weak and declining economy. That is impossible."

Now that the present political regime has been re-established in power, continued Mr. Sloan, "Let us hope that industry can expect more than a breathing spell necessitated by the program of national defense. Ironically the very individuals, the very industrial organizations, which, during the past few years, have been under political attack and held up to public scorn as enemies of the public interest have now become vital instrumentalities of national defense. The nation turns to them to protect itself against aggression."

The demands confronting this country at present emanate from three sources, said the speaker. These are the normal peace-time demands of our people; the abnormal demands of our defense program, and the abnormal demands incident to the defense needs of Great Britain.

All these demands can be met, Mr. Sloan advised, but more work and more efficient work will be required. The speaker suggested a longer work week be established—six days instead of five—and that present overtime penalties be sus-

pending. Steadier work and longer hours would result in larger earnings and a higher living standard.

Priorities control of materials should be enforced when necessary, both to insure proper distribution of essential equipment and materials and to avoid starting an inflationary price movement.

Inflation, declared Mr. Sloan, is the most striking economic danger today. "Price disorders exert a profound influence on the economy. They work against the efficient mobilization of the nation's resources. An inflationary process affects prices, profits, rents and wage rates very unevenly. It creates arbitrary and useless changes in the distribution of real income.

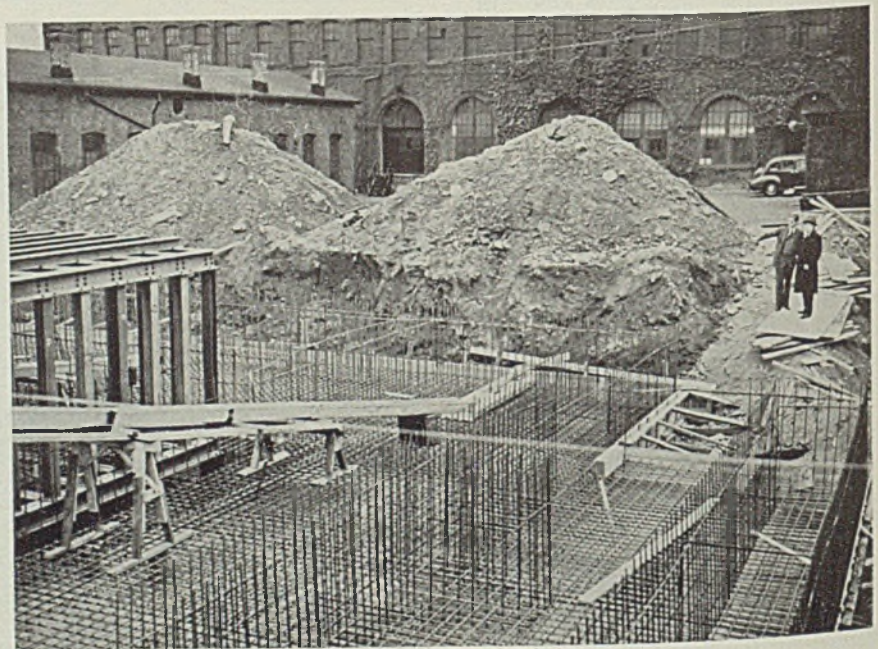
Storm Damage Cuts Iron Ore Shipments

■ Severest storm damage on the Great Lakes in 27 years resulted last week when two lake freighters foundered off the east coast of Lake Michigan, midway between the north and south ends, near Ludington, Mich. Known loss of lives, including several washed overboard from grounded vessels, was 57.

Freighters sunk in the storm included the WILLIAM B. DAVOCK, 7200-ton ore and coal carrier, operated by Pickands, Mather & Co., Cleveland; and the ANNA C. MINCH, 4200-ton Canadian grain carrier, owned by Sarnia Steamships Ltd., Sarnia, Ont. Two small fishing tugs were also reported lost.

At least six vessels were ground-

Steel Bombproof Shelter To Guard Edison Relics



■ Steel and concrete subterranean vault to guard papers, models and other mementoes of the late Thomas A. Edison is being built at the plant of Thomas A. Edison Inc., West Orange, N. J. The structure is being made bombproof against eventualities of war. Inspecting the work is Charles A. Edison, governor-elect of New Jersey, and Norman R. Speiden, director of historical research for the Edison laboratory. Wide World photo

ed during the storm, several sustaining considerable damage. Many others were damaged severely, requiring immediate repairs.

The ore carrier, SPARTA, operated by G. A. Tomlinson, Cleveland, had been grounded near Munising, Mich., in a storm several days earlier. After inspection revealed damage was too great, the 3832-ton vessel was abandoned.

Storm's effect decreased by about 2,000,000 tons the total estimate of ore that will be transported to lower lake docks and yards this year. Numerous ships must be docked for repairs, cutting the shipping season short. Plans had been to extend the season into December, weather permitting. More than 2,000,000 tons had been delivered at lower lake docks in the first nine days of November.

TCI Expands, Increases Capacity 20 Per Cent

■ A broad program involving an expansion of the steelmaking and finishing facilities at Birmingham, Ala., of the Tennessee Coal, Iron & Railroad Co., United States Steel Corp., subsidiary, was announced last week at Birmingham by Robert Gregg, president.

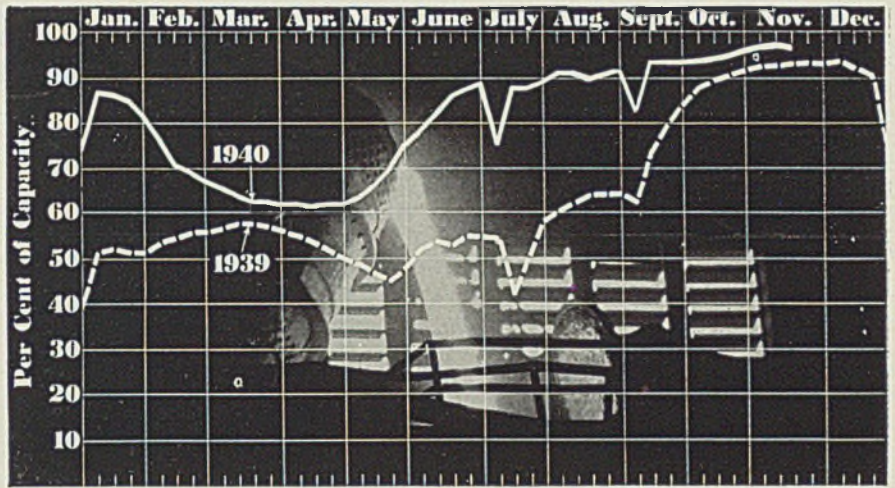
The new facilities will result in approximately a 20 per cent increase in the ingot capacity, a little more than 400,000 tons, and a corresponding increase in the finishing capacity of the corporation's southern subsidiary.

These improvements, which will require about 18 months to complete, will place the company "in a materially improved position to carry out any obligations which may be required as a consequence of the national defense program."

They comprise the following important features:

Construction of an additional battery of coke ovens and an additional blast furnace at Fairfield steelworks; improvements to the existing open-hearth furnaces; development of ore and coal mining facilities to meet the requirements of the new blast furnace; additions and improvements to the plate mill at Fairfield, including a new 140-inch, four-high plate mill; additional wire-drawing, galvanizing and finishing facilities at the Fairfield wireworks; and additional processing and finishing facilities at the Fairfield sheet mill.

These changes will necessitate enlarged operations at the ore mines, coal mines and quarries, including mechanical equipment, additional transportation facilities, and, to the extent necessary, enlargements and improvements in the steam and electric power plants and the water supply system.



PRODUCTION... Down

■ STEELWORKS operations last week declined ½-point to 96 per cent, because of repairs and a strike interruption. Three districts made slight increases, three went to lower levels and six were unchanged. A year ago the rate was 93½ per cent; two years ago it was 63 per cent.

Detroit—Unchanged at 93 per cent, 24 of 26 open hearths in service.

Cincinnati—One open hearth was taken off for repairs, lowering the rate 6 points to 88 per cent.

St. Louis—Held at 85 per cent for third consecutive week.

Birmingham, Ala.—Steady at 100 per cent for the third week, all 24 open hearths in production.

Youngstown, O.—Advanced 1 point to 93 per cent, with three bessemer and 72 open hearths in production. Republic Steel Corp. added one open hearth.

Chicago—Rose 2 points to 99 per cent, equaling the alltime high of Aug. 26 and Oct. 14.

Pittsburgh—Repairs and a strike at one plant lowered production 3 points to 94 per cent.

Wheeling—Sustained operations at 98½ per cent indicate heavy backlogs.

Central eastern seaboard—Although minor fluctuations occurred

in furnace operations the rate averaged 94 per cent, as in the two preceding weeks.

New England—Continued at 85 per cent.

Buffalo—One open hearth was taken off for repairs, lowering the rate 2½ points to 90½ per cent.

Cleveland—Completion of furnace repair raised the rate 1½ points to 88 per cent.

Bethlehem Opens New Bar Mill at Buffalo

■ Bethlehem Steel Co. last week started operations at its \$4,500,000 bar mill addition at Buffalo. First steel to be rolled was shell rounds in the smaller sizes. Plant's capacity will be 15,000 tons of bars monthly.

The addition comprises six connecting buildings located in the town of Hamburg, just west of the Lackawanna city line. They are equipped with the latest type furnaces, temperature and pressure controls and bar-cooling apparatus. The addition replaces the old No. 6 12-inch bar mill.

One of the advantages resulting from the improved and relocated mill is the elimination of a bottleneck in the finishing department. The new mill can operate two or three shifts.

The new structures contain 404,000 square feet of floor space, 228 motors furnishing an aggregate of more than 9000 horsepower, 13 cranes.

Edward F. Entwisle, manager of the plant, said the improvements will enable better service to the automotive and other bar-consuming industries in the lakes area.

District Steel Rates

| | Percentage of Ingot Capacity Engaged | | In Leading Districts | |
|-------------|--------------------------------------|--------|----------------------|------|
| | Week ended | Change | Same week | |
| | | | 1939 | 1938 |
| Pittsburgh | 94 | - 3 | 94 | 52 |
| Chicago | 99 | + 2 | 93 | 60 |
| Eastern Pa. | 94 | None | 87 | 36 |
| Youngstown | 93 | + 1 | 90 | 60 |
| Wheeling | 98.5 | None | 93 | 66 |
| Cleveland | 88 | + 1.5 | 90 | 79.5 |
| Buffalo | 90.5 | - 2.5 | 93 | 49 |
| Birmingham | 100 | None | 94 | 68 |
| New England | 85 | None | 100 | 80 |
| Cincinnati | 88 | - 6 | 88.5 | 75 |
| St. Louis | 85 | None | 81 | 51.5 |
| Detroit | 93 | None | 95 | 82 |
| Average | 96 | - 0.5 | 93.5 | 63 |

MEN of INDUSTRY

■ J. A. INGWERSEN has been named manager, sheet and strip sales division, American Rolling Mill Co., Middletown, O., and F. E. Wortley has been promoted to manager of midwestern sales, succeeding Mr. Ingwersen.

Mr. Ingwersen, after several years of newspaper work, joined Armco in 1923 in the personal relations division. In 1925 he was transferred to the sales division and subsequently served as a salesman in the Chicago district; assistant manager, ingot iron sales section; manager in charge of hot and cold-rolled sheet sales, and in 1939 was made manager of midwestern sales.

Mr. Wortley joined Armco in 1912 as a salesman in the New York district. In 1929 he was transferred to Pittsburgh and became assistant district manager in charge of ingot iron sales there in 1930. He later was promoted to district manager at Cleveland, and in 1939 was named assistant manager of midwestern sales, located in Middletown.

George J. Kruse Jr., forging engineer, General Metals Corp., Houston, Tex., has been named manager, Western Forge & Tool Works, Oakland, Calif.

Paul J. Darling, the past 11 years associated with Steel Sales Corp., Chicago, as salesman and recently as assistant sales manager, has been promoted to sales manager.

W. C. Buchanan, president, Globe Steel Tubes Co., Milwaukee, has been elected a director, Allis-Chalmers Mfg. Co., Milwaukee, to fill a vacancy on the board.

David S. Lewis has been appointed assistant to T. W. Pennington, sales manager, Jessop Steel Co., Washington, Pa. Mr. Lewis joined the sales department of Jessop in 1928.

John F. Ditzell has been named general sales manager, Shafer Bearing Corp., Chicago. Mr. Ditzell was for a number of years a sales executive of Stewart-Warner Corp., Chicago.

Oliver Smalley, president, Meehanite Metal Corp., Pittsburgh, was re-elected president, Meehanite Research Institute of America Inc., at its twelfth annual meeting in Milwaukee, Oct. 30.

W. P. Knecht has been appointed



J. A. Ingwersen



F. E. Wortley

district sales manager at Worcester, Mass., for Universal-Cyclops Steel Corp., Bridgeville, Pa. He succeeds W. J. Long, who has been transferred to Bridgeville.

Lee F. Frampton has been appointed sales representative by A. Milne & Co., New York, for its tool and drill steels in the Blue Ridge-Ohio valley territory, with headquarters at 401 Thirteenth street, Parkersburg, W. Va.

Gordon H. Chambers, vice president, Foote Mineral Co., Philadelphia, has recently returned from an extended vacation to South America. Mr. Chambers visited Peru, Bolivia, Argentina, Brazil, Porto Rico and Haiti.

Bruce P. Hetler, heretofore general sales manager, Blackmer Pump Co., Grand Rapids, Mich., has been made manager in charge of engineering sales, and J. B. Trotman,

formerly manager, turbine pump division, Roots-Connersville Blower Corp., Connersville, Ind., has become general sales manager in charge of sales distribution and advertising.

Alfred R. Conti, until recently an assistant in the sales office of Vascoloy Ramet Corp., North Chicago, Ill., is now representing the company as a salesman in the Illinois, Indiana and western Michigan territory.

R. A. Karr has been appointed metallurgist, Copperweld Steel Co., Warren, O. He formerly was associated with Battelle Memorial institute, Columbus, O., and later with Central Alloy division of Republic Steel Corp.

Harvey L. Miller has been named manager of the district office recently established by Wheeling Steel Corp., Wheeling, W. Va., at 2508 Gulf building, Houston, Tex. I. G. Thompson continues as district sales manager at Dallas, Tex.

Arthur F. Schuck, the past ten years a member of the general executive organization of Sears, Roebuck & Co., Chicago, has joined the staff of McClure, Hadden & Orman Inc., Chicago, management engineers.

Herman L. Cook, well known ceramic engineer and enameling superintendent of the Norge division, Borg-Warner Corp., Muskegon, Mich., has resigned to join the sales service staff of O. Hommel Co., Pittsburgh.

M. L. Frey, formerly contact metallurgist for Republic Steel Corp., Detroit, has been named aircraft metallurgist for Packard Motor Car Co., Detroit, working under direction of W. H. Graves, chief metallurgist. Mr. Frey was with Republic five years, three in the Buffalo territory and two in Detroit.

R. N. Miers has been appointed eastern district engineer of Allis-Chalmers Mfg. Co.'s steam turbine division, with headquarters in Boston. The past six years Mr. Miers has been engaged with steam turbine sales and general engineering matters at Milwaukee.

L. G. Atkinson has been appointed manager of a new section of the circuit breaker sales department.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. After two years in the Westinghouse student course, he joined the engineering department, switchgear division. In 1936 he went into the sales department of switchgear and now has been made head of sales for small De-ion circuit breakers.

Dr. Edward Bartow, who has been granted a year's leave of absence as emeritus professor of the University of Iowa department of chemistry and chemical engineering, has joined the research laboratories of Johns-Manville Corp., Manville, N. J., as chemical consultant.

Clyde E. Lowe, representative in the Pittsburgh area for the metal cleaner department of Cowles Detergent Co., Cleveland, has been transferred to Chicago. He will work with James H. Rhodes Co., Chicago, Cowles metal cleaner distributor in the Chicago territory.

N. K. Koebel, the past five years metallurgist, Eastman Kodak Co., Rochester, N. Y., and for a year prior to that research fellow at Battelle Memorial institute, Columbus, O., has been made metallurgist in charge of research and technical problems, Lindberg Engineering Co., Chicago.

W. C. Doemel, formerly manager, Webster Mfg. Inc., Tiffin, O., has been appointed superintendent, Vulcan Mold & Iron Co., Latrobe, Pa. He will be in complete charge of the company's manufacturing operations, effective Jan. 1, 1941.

R. T. Dunlap, who until a few months ago was superintendent, and is now plant manager, is resigning Jan. 1 to become works manager, Vulcan Iron Works, Wilkes-Barre, Pa.

Jack F. Wolfram, formerly experimental engineer for Oldsmobile division, General Motors Corp., Lansing, Mich., has been appointed assistant chief engineer in charge of engine, transmission and axle design.

Maurice A. Thorne, heretofore chassis engineer, has been named assistant chief engineer in charge of body, chassis, electrical and accessory groups and office administration.

John Oswald, body engineer since 1929, has become director of styling.

Leonid A. Umansky has been named assistant manager, industrial engineering department, General Electric Co., Schenectady, N. Y. Francis Mohler has been made engineer, steel mill section, succeeding Mr. Umansky. Born in Russia, Mr. Umansky was educated at the Polytechnic Institute of Petrograd. He

joined General Electric in February, 1919, as a test man; a year later was transferred to the power and mining engineering department, remaining with that department until 1931. He then was transferred to the International General Electric Co. and took up work in Russia. He returned to the industrial engineering department in 1933.

Mr. Mohler, educated at Virginia Polytechnic institute, joined the company in 1926 as a test man, and two years later was transferred to the industrial control engineering department. In 1929 he joined the steel mill section of the industrial engineering department.

Donald R. G. Cowan has resigned as chief statistician, commercial research department, Swift & Co., Chicago, to become manager of commercial research for Republic Steel Corp., Cleveland. A native of



Donald R. G. Cowan

Stroud, Ont., Mr. Cowan was graduated from Queen's university in 1917 where he won the Sir James Gowan prize in political science. He received his M. A. degree from the University of Toronto in 1918, and took graduate courses at the University of Minnesota, University of Chicago and Northwestern university, receiving his Ph. D. degree from the University of Minnesota in 1934. He joined Swift & Co. in 1925 and served as chief statistician since 1935. Throughout his career he has been a teacher of economics, marketing and allied subjects in midwestern colleges and universities and at present is president, American Marketing association.

Israel Citron, Citron-Byer Co., Trenton, N. J., has been re-elected president, New Jersey chapter, Institute of Scrap Iron and Steel Inc. Other officers re-elected are: First vice president, Irving I. Werblin, Werblin Bros., Somerville, N. J.; second vice president, Harry Wische,

Lowenstein Bros. Inc., Newark, N. J.; third vice president, Irving Feldman, P. Feldman & Sons Inc., Elizabeth, N. J.; secretary, Murray Kunin, Schiavone-Bonomo Corp., Jersey City, N. J.; treasurer, Eli Bussell, Plainfield Iron & Metal Co., Plainfield, N. J.

R. R. Danielson, Metal & Thermit Corp., and vice president of Porcelain Enamel institute, Chicago, announces appointment of Dr. G. H. McIntyre, director of research, Ferro Enamel Corp., Cleveland, as chairman of the committee on the research associate at the national bureau of standards. This committee supervises the work of Dr. Paul Smith, who has served as research associate for the institute the past three years.

James Work has been elected chairman of the board, Brewster Aeronautical Corp., Long Island City, N. Y. Other officers elected include: George F. Chapline as president and general manager; Dayton T. Brown as vice president in charge of experimental research and development, and William L. Smith, vice president in charge of materiel.

Mr. Chapline formerly was vice president in charge of sales, Wright Aeronautical Corp. Mr. Smith resigned from Western Electric Co. last October to join Brewster. Until Aug. 20, 1940, he was director of air purchases for the British Purchasing commission, a duty assumed in December, 1939, when Western Electric granted him a leave of absence as contract engineer.

Irvin A. Brinkman, Mackintosh-Hemphill Co., Pittsburgh, has been elected general chairman, metals section, executive committee, National Safety council, Chicago, for the term 1940-41. Vice chairmen are: H. J. Spoerer, Youngstown Sheet & Tube Co., East Chicago, Ind., and R. H. Ferguson, Republic Steel Corp., Cleveland.

Chairmen of other committees are: Engineering, J. E. Culliney, Bethlehem Steel Co., Bethlehem, Pa.; foundry, J. H. Holzbog, Chain Belt Co., Milwaukee; health, Dr. T. Lyle Hazlett, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; membership, Frank W. Kelsey, Jones & Laughlin Steel Corp., Aliquippa, Pa.; poster, N. B. MacHose, Bethlehem Steel Co., Lackawanna, N. Y.; program, Jacob L. Ridinger, Inland Steel Co., East Chicago, Ind.; publicity, W. A. Jarvis, Chase Brass & Copper Co., Waterbury, Conn.; railway car builders, P. J. Brand, Pullman-Standard Car Mfg. Co., Chicago; statistics, Earl Fyler, Carnegie-Illinois Steel Corp., Gary, Ind.

Management Asks for Speed in Expanding Apprentice Training

■ OUR RATE of mobilization in this country must be greatly accelerated. While many executives point out that they are witnessing conditions similar to those in 1916, the national defense administrative body is more efficient.

This was the message of Alvin E. Dodd, president, American Management association, who spoke at the opening session of the association's fall production conference last week in Cleveland.

We still have certain bottlenecks but they are not of such caliber as confronted industry during the last World war. He cautioned that manufacturers are close to a priorities system.

G. H. Prudden, works manager, Vega Airplane Co., Burbank, Calif., told how his company, faced with the necessity of rapidly expanding its working force, turned to scientific selection methods in finding workers who were properly qualified. He asserted that the employment office is able to weed out the temperamental misfits, the "gold-bricks" and other undesirable applicants.

"On the other hand, we are frequently able to direct men to suc-

cess by proper placement. It is unfortunate that many men have not had vocational guidance. If they are temperamentally suited to the work and have the right attitude, we will train them. We have 5000 men in training now."

In conclusion the speaker referred to skill. This quality is considered, not for the purpose of selecting geniuses, but to avoid such obvious mistakes as placing an exceptionally intelligent individual in a routine, monotonous job on which he soon will become stale and dissatisfied.

Scrap Increased

W. H. West, assistant factory manager, Thompson Products Inc., Cleveland, announced that in one year the personnel at his plant increased from 1591 to 3960 workers. Plant expansion brought new problems. Analyzing facts it was found that new and inexperienced help was perhaps the major cause for an increase in scrap and repair during the expansion program.

Experienced help was used for supervision and the proportion of inexperienced rose rapidly. The problem of maintaining quality and quantity of production became near-

ly insurmountable. Scrap and repairs on some items equalled pieces shipped and it was necessary to work overtime to meet schedules. With the cost of the product mounting steadily, it became necessary to remedy the situation.

Consequently, a learners' program was established. Experienced inspectors were placed on all shifts to trace daily scrap and repairs to their source and assist in determining the cause. Layoff periods to men persistent in causing repairs and making scrap proved helpful.

Inadequate and poorly designed tools and poorly maintained equipment contribute in a large measure to the cause of scrap and repairs, the speaker stated. Operations causing the largest number of rejections were carefully studied and improvements resulted. In some instances, customers were requested to revise specifications, with excellent results to both parties. Routings were corrected to improve the product, and production lots increased.

The plan of having the customer's inspectors sent to the plant has resulted in a better understanding of the customer's requirements, the speaker explained. Overlapping of the third and day shift supervision also proved helpful.

Despite the fact that the aviation industry has about 100,000 workers, it will be necessary to have from 500,000 to 600,000 workers to meet production schedules for airplanes, according to W. F. Patterson, chief of apprenticeship, division of labor standards, department of labor, Washington. A small percentage of workers in this industry will have to be skilled mechanics. In the shipbuilding and construction industries, the ultimate skilled workers will be about 60,000, according to Mr. Patterson.

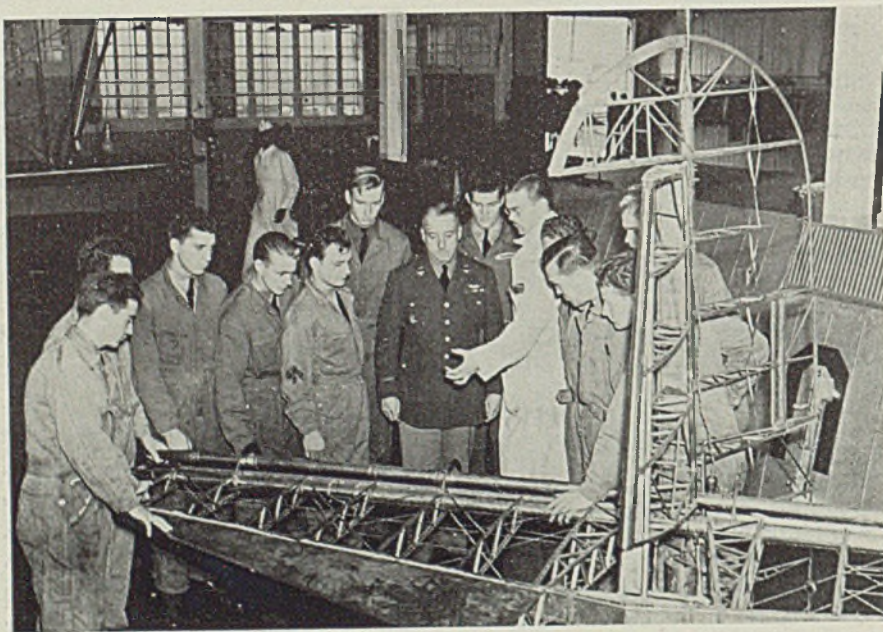
The situation today, the speaker stated, is that whereas the country had previously committed itself to a comparatively slow-growing national system of apprenticeship, now it becomes necessary to do in one year what we had normally planned to do in 15 years.

October Gear Sales Gain 18 Per Cent

■ Gear sales in October were 18 per cent higher than in September and 53 per cent above October, 1939, according to the American Gear Manufacturers' association, Wilksburg, Pa. The association's index for October stood at 216 compared with 183 in September, and 141 in October last year.

For ten months this year, gear sales showed an advance of 18.7 per cent over the comparable period in 1939.

Air Corps Commander Inspects Training School



■ Brig. Gen. Rush B. Lincoln (in uniform), United States army air corps, listens to an explanation of instruction methods at the Rising Sun School of Aeronautics, Philadelphia, where more than 100 army enlisted men are enrolled. General Rush is making a nation-wide tour of schools training men for technical work with the air corps. NEA photo

Congress To Explore for Another Billion Dollars in Taxes

WASHINGTON
■ GOVERNMENT tax officials are planning to get at least another billion dollars out of business and the people of the country in a new tax bill which it is believed will be taken up shortly after congress convenes on Jan. 3. Details have not yet been worked out, but there is much talk of more taxes on excess profits and individual incomes.

Secretary of the Treasury Morgenthau already has committed the administration to seek more revenue from the next congress.

Congressional leaders probably will be consulted before any decisions are made. While such conferences are in progress, however, Secretary Morgenthau will present his plan for increasing the federal debt limit \$15,000,000,000 to \$20,000,000,000 above the present \$49,000,000,000 restriction, to finance the defense program.

Upward revision of the recently enacted excess profits tax was taken almost for granted by a number of treasury officials. From this revision alone, they hinted, the revenue possibilities run as high as \$500,000,000.

The corporate excess profits tax, together with the increased corporate income tax enacted with it a few weeks ago, were said by some to necessitate a similar increase in

individual income tax rates which might bring in upward of \$100,000,000 more taxes.

Officials said that while the excess profits law is designed to capture a portion of the extra profits apparently ahead for corporations as a result of the defense program, nothing had been done to tax similar profits which individuals might reap from the preparedness spending.

Taking a contrary view, others argued that the individual income tax law provides for such situations automatically, with its graduated rates from 4 to 79 per cent.

Although congress has been manifestly reluctant on the subject, Secretary Morgenthau and the administration have indicated their intention of seeking legislation to tax the income from all future issues of governmental securities. If enacted, however, this levy would not produce much for several years, or until the volume of new securities reached high totals.

Copperweld Steel Adds Two Electric Furnaces

■ Copperweld Steel Co. has started construction on a 25-ton and a 10-ton top-charging electric furnace at its Warren, O., plant. When the furnaces are completed in January

the company will have three 25-ton furnaces and the 10-ton unit for the production of all grades of alloy steel.

S. E. Bramer, president, also announced the company recently has added two heat-treating furnaces, bringing total heat-treating capacity to 1200 tons a month, and two annealing furnaces to raise annealing capacity to 3000 tons a month.

Third Woodward Stack To Be Air Conditioned

■ Woodward Iron Co., Woodward, Ala., has let contracts to Shook & Fletcher Supply Co., Birmingham, for air conditioning the company's third blast furnace at a cost estimated at \$125,000.

The first two Woodward stacks were air conditioned in 1939 with equipment supplied by the Carrier Corp., Syracuse, N. Y. A description was presented in STEEL, Nov. 20 and 27, 1939.

Died:

■ EUGENE W. PARGNY, former president, American Sheet & Tin Plate Co., in New York, Nov. 9. Mr. Pargny retired as president of American Sheet & Tin Plate, Jan. 1, 1934, after serving in that capacity since 1909. Born in Louisville, Ky., he first became associated with the steel industry in 1882 with the Apollo Iron & Steel Co.

A. W. Lucas, the past 11 years New England sales manager for Jessop Steel Co., Washington, Pa., Oct. 26, in New Haven, Conn.

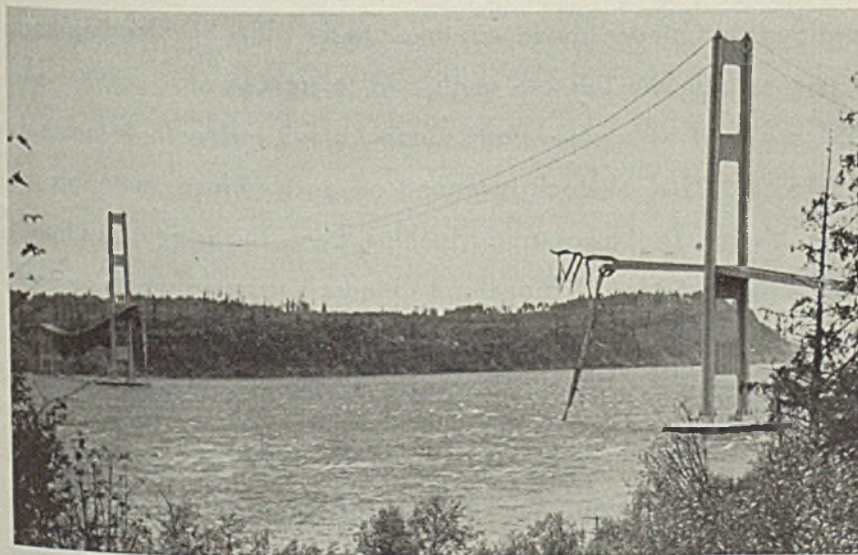
George W. Charles, 83, at one time treasurer and director, Kokomo Steel & Wire Co., Kokomo, Ind., now a part of Continental Steel Corp., in Kokomo, Nov. 5.

Emil Vilter, 69, chairman of the board, Vilter Mfg. Co., Milwaukee, in that city, recently. Mr. Vilter was president from 1919 until 1934.

Verne E. Sorge, 56, president, Pyramid Stamp & Tool Co., Detroit, in that city, Nov. 11. He was at one time identified with the foreign sales department of Hudson Motor Car Co., and founded the Pyramid company in 1919.

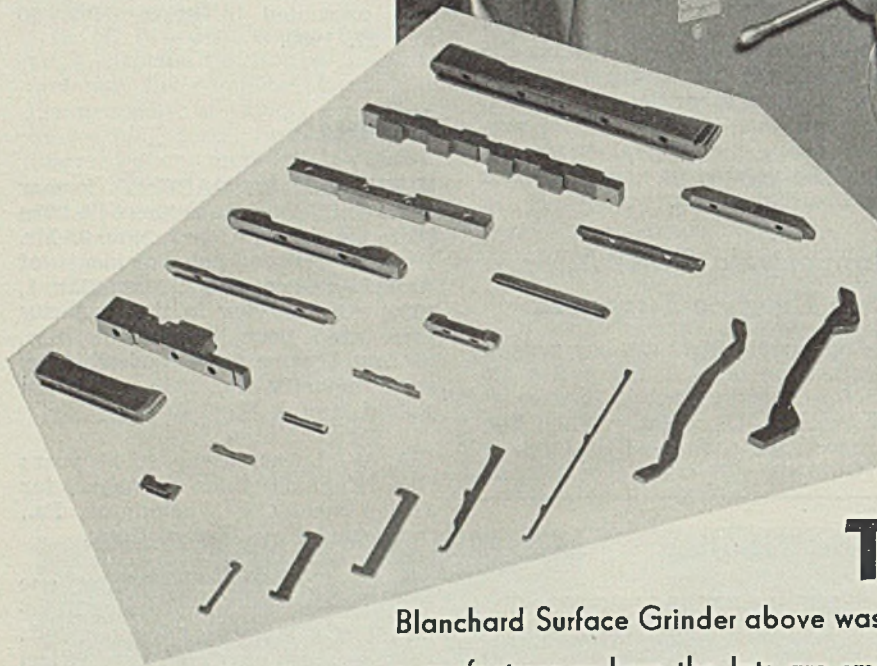
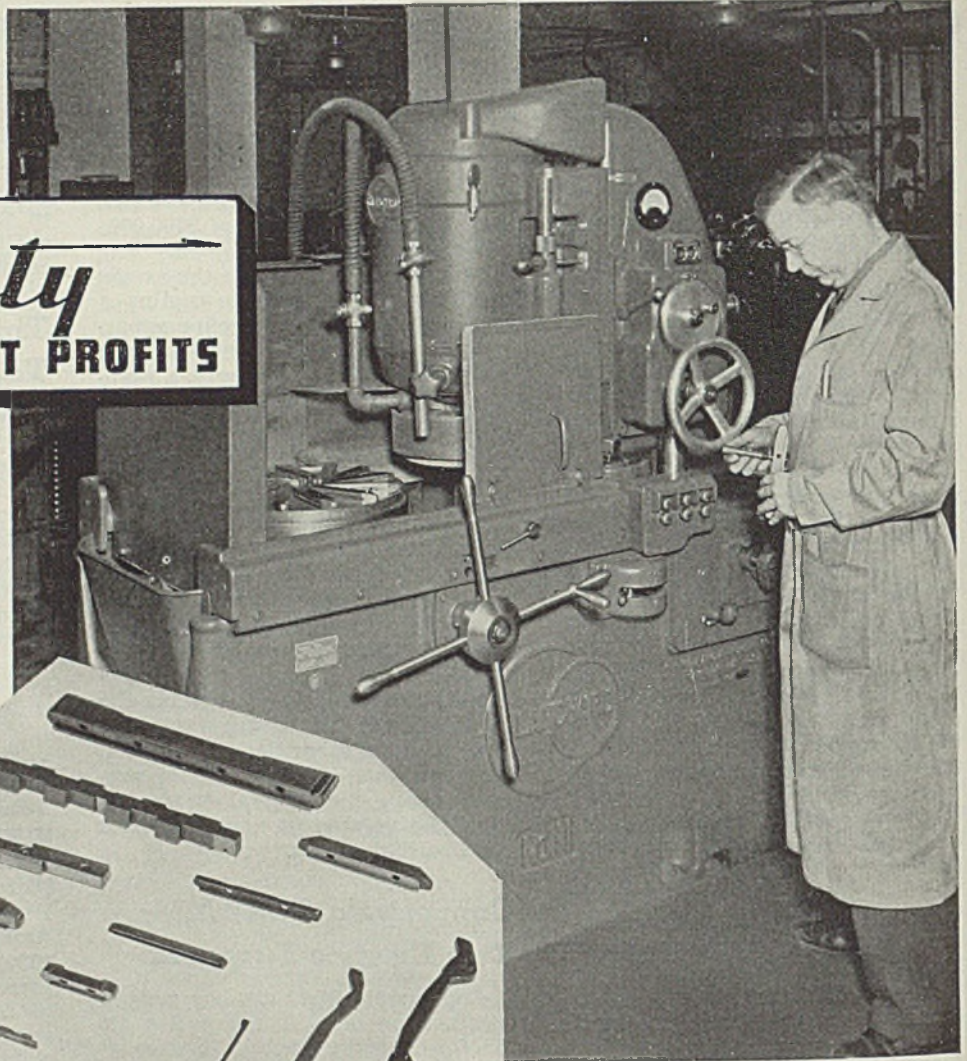
Frank M. Raymond, 59, vice president, Raymond Mfg. Co., Corry, Pa., in Corry, Nov. 7. A native of Corry, Mr. Raymond spent practically his entire life there with the exception of several years at Seattle as Pacific Coast representative of Climax Mfg. Co. Mr. Raymond also was vice president, Associated Springs Corp., parent company.

Tacoma Bridge To Be Rebuilt



■ While engineers expressed various opinions last week regarding the cause of the collapse of the \$6,400,000 Narrows suspension bridge at Tacoma, Wash., the state toll bridge authority announced insurance is ample to cover immediate rebuilding. The main cables withstood the 42-mile gale but hangers supporting the roadway snapped. NEA photo

Variety
WITH CONSISTENT PROFITS



This group of parts is ground to limits of $+.0000''$ and $-.0005''$ on a Blanchard No. 11 Surface Grinder.

THE photograph of the No. 11 Blanchard Surface Grinder above was taken in the plant of a leading hone manufacturer — here the lots are small, yet tolerances of $+.0000''$ and $-.0005''$ are held with ease. Parts range from 3 inches to 8 inches in length; $.015''$ to $.020''$ of stock is ground off each surface; materials are Mild Steel, Vulcan Tool Steel, and Machine Steel. This is a typical installation where the new No. 11 Blanchard Grinder is earning profits on parts which vary in quantity, length, thickness, and material — parts on which profits are lost with a machine of less modern design than the Blanchard.

Your own surface grinding jobs will be analyzed by Blanchard engineers without obligation — just send them complete information.



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Windows of WASHINGTON



By L. M. LAMM
Washington Editor, STEEL

Conference To Facilitate Rearmament Program.

Plan Utilization of All Industrial, Banking Resources.

Supreme Court Rules Against NLRB in Republic Case.

Machine Tool Priorities Committee Is Established.

WASHINGTON

■ CONFERENCE was held last week to facilitate the defense program by utilizing all available units of the nation's industrial and banking system. Attending were members of the national defense advisory commission, army and navy procurement officers, governors of the federal reserve system. Representatives of the 12 federal reserve banks and 24 branches, representatives of the treasury and commerce departments, reconstruction finance corporation and the securities and exchange commission also attended.

The conference was arranged by Ernest G. Draper of the board of governors and Donald M. Nelson, co-ordinator of national defense purchases, to familiarize the reserve bank officers with the defense commission's plan of dealing with smaller business and industrial establishments in relation to the defense program.

Mr. Nelson stated: "The fulfillment of the defense program has raised a grave challenge which the commercial banks of the nation must face. The future status of the commercial banking system will in large part be influenced by the manner in which our local banks rise to meet this challenge of providing total finance for total defense."

Brig. Gen. H. K. Rutherford, chief of the war department's planning division, described the industrial planning activities of the war department. Col. John W. N. Schulz, of the war department's procurement division, explained the methods used by the army in making purchases of materials and supplies; and location of the various army procure-

ment centers. Capt. David I. Hedrick, of the ordnance division of the navy, described the purchasing methods used by the navy department.

Stacy May, director of the bureau of research and statistics, defense commission, described the present regional distribution of defense contracts in terms of the federal reserve districts, and the volume and type of such contracts. Especially prepared maps were furnished to each of the reserve bank officers showing the location of all army and navy procurement depots in relation to the federal reserve banks and their branches.

Explains Plant Facilities Contract

David Ginsberg, legal advisor to the defense commission's price stabilization division, discussed the recently drafted plant facilities contract and the proposed uniform provisions of the war and navy department supply contracts which have been drafted by legal experts of the armed services, the treasury department and the defense commission. Mr. Ginsberg also discussed the legal aspects of the assignment of claims against the government resulting from defense contracts. Peter R. Nehemkis Jr., of the office of the director, small business activities, discussed the methods which will be used in keeping federal reserve bank officials supplied with current information on procurement needs.

Mr. Nelson made it clear that although he hoped his office would be regarded by small business men as "their friend at court", the plan is neither "the millennium for small

business" nor a design for "converting little business men into big business men." He said there is no reason for thinking of big business or small business as separate industrial compartments.

"Our job," he stated, "is to think in terms of men, materials and money, which means thinking of industry as a whole. Total defense requires the utilization of all available plant capacity; of all available man power; of all available financial resources . . ."

"When this rearmament effort is over—as we all hope it will soon be—our economy should not find itself in the condition in which it was in the early twenties when we had over-expanded our industrial plant without giving due consideration to permanent civilian requirements."

Mr. Nelson referred to President Roosevelt's suggestion that one-half of our defense production go to Great Britain. In this connection, he emphasized the heavy burden being placed upon the "army of sub-contractors" who were "feeding the assembly lines for guns, tanks, and planes." The army and navy having let over \$8,000,000,000 of contracts, the defense commission wants to make sure there will be no interruption in the flow of materials due to inadequate financial resources of the smaller business units.

To this end the federal reserve system will serve as operating agent for the defense commission. At the request of the federal reserve board, an officer has been designated in each federal reserve bank and branch to handle all problems relating to field and technical activities of the smaller business enterprises. The board has designated Ernest G. Draper as its representative in this work.

It is expected federal reserve bank officers will report on availability of small business enterprises in their districts to participate in the defense program; to familiarize local banks with the procedure to be followed in accepting assignment of government claims as security

for loans; to encourage local banks to make loan commitments on condition that borrowers obtain government contracts; to furnish business enterprises in their districts with information on the procedure to be followed relative to obtaining defense contracts; and to assist small business enterprises to obtain necessary financing from their local banks.

By utilizing the services of the federal reserve banks in their territories, the smaller business men will be in a position to obtain promptly information they require to play their part in the defense program.

SUPREME COURT FINDS FOR REPUBLIC STEEL CORP.

In a decision rendered last week by the United States Supreme Court in the Republic Steel Corp. case, it was held that the national labor relations board does not have the right to require a company, found guilty of violating the labor act, to reimburse governmental relief agencies for wages paid employes held to have been deprived of their regular work.

Asserting that "the theory advanced by the board proceeds upon a misconception" of the labor law, the court declared that the Wagner act is "essentially remedial" and "does not carry a penal program declaring the described unfair labor practices to be crimes."

The court held that the board had exceeded its powers in ordering the corporation to reimburse the government for relief money paid to Republic workers who were found to have been illegally discriminated against by the company.

Under the board's decision, said the court in an opinion written by Chief Justice Hughes, the payments of Republic to the governmental relief agencies are conceived "as being required for the purpose of redressing, not an injury to the employes, but an injury to the public." So conceived, "these required payments are in the nature of penalties imposed by law upon the employer."

But, said the court, "the act does not prescribe penalties or fines in vindication of public rights or provide indemnity for community losses as distinguished from the protection and compensation of employes."

"We do not think that congress intended to vest in the board a virtually unlimited discretion to devise punitive measures, and thus to prescribe penalties or fines which the board may think would effectuate the policies of the act."

The Wagner act, said the court, gives the board power to carry out "remedial measures" against unfair labor practices—but "to go further and to require the employer to pay

to governments what they have paid to employes for services rendered" is an "exaction" for which "we find no warrant."

In agreement with the opinion of the chief justice were three of President Roosevelt's appointees—Justices Reed, Frankfurter and Murphy. Justice Roberts did not participate in the decision.

The Black-Douglas dissenting opinion held that "a back-pay order as applied to the employer will effectually aid in safeguarding" the rights guaranteed by the Wagner act.

The knowledge of the employer, they said, "that he may be called upon to pay out the wages his employes would have earned but for their wrongful discharge, regardless of any assistance the government may have rendered them during their unemployment, might well be a factor in inducing an employer to comply with the act."

The sum paid by relief agencies to the workers, which the board wanted Republic to pay back, has been estimated at from \$200,000 to \$400,000. The dispute grew out of the "Little Steel" strike of 1937.

The board has made similar reimbursement orders in a number of cases.

Some observers saw in the Republic decision indirect support for opponents of the contention that the government should not make defense contracts with firms found guilty by the labor board of violating the Wagner act.

The official stand of the war department is that past violation of the Wagner act is no bar to defense contracts except insofar as potential labor troubles may impede a firm's production.

MACHINE TOOL PRIORITY COMMITTEE ESTABLISHED

Priorities board has announced the establishment of a machine tool priority committee to co-ordinate national defense, commercial and export demands on the machine tool industry.

The committee, composed of representatives of the industry, the army, navy and defense commission, will formulate policies governing operation of the voluntary preference rating system, now in effect, as it applies to machine tool contracts. Such policies will be submitted through Donald M. Nelson, administrator of priorities, to the priorities board for consideration and approval.

Mason Britton, assistant director of the machine tools and heavy ordnance division of the defense commission, has been appointed administrative officer of the committee. Mr. Britton, working under the direction of the administrator of priorities, will carry out policies

formulated by the committee and approved by the board. He will handle all pertinent cases that may arise and will maintain the necessary contacts with industry and with government departments.

The committee will not be concerned with questions of precedence between various national defense contracts placed by the army and navy. This function will remain in the hands of the priorities committee of the army and navy munitions board.

Members of the machine tool priority committee are: Mr. Britton, administrative officer; Clayton R. Burt, president of the Pratt and Whitney division, Niles-Bement-Pond Co., and chairman of the machine tool builders defense committee; Frederick Geier, president of the Cincinnati Milling Machine Co.; Lieut. Col. A. B. Johnson, chief of the machine tool committee of the army and navy munitions board, representing the army; and Commander E. R. Henning, member of machine tool committee of the army and navy munitions board, representing the navy.

LEADERS IN CONGRESS TO SEEK ADJOURNMENT NOV. 19

On November 19, leaders of both the house and senate are going to make an effort to adjourn congress *sine die*.

There is considerable opposition to congress adjourning, especially among the Republican membership of both houses of congress on the basis that an emergency might come up unexpectedly any time. This view also is shared by some of the Democratic members. Effort was made some time before congress recessed for the election to have it adjourned but it was not possible for the leaders to corral sufficient votes for this.

Regardless of whether congress adjourns at that time, the new session convenes on Jan. 3.

DOUGLAS AIRCRAFT AWARDED \$11,254,700 FOR EXPANSION

War department announced last week award of a \$11,254,700.71 contract to Douglas Aircraft Co., Santa Monica, Calif., for plant expansion construction by Douglas' subsidiary, Western Land Improvement Co., at Long Beach, Calif.

New facilities will be constructed under terms of the emergency plant facility contract and the company will furnish funds for construction. Government will repay cost of the expansion over a five-year period; at end of that time contractor will have option to purchase the property at cost less some pre-arranged rate of depreciation or at some negotiated sum.

How Presidential Election Is Viewed in Steel Communities

By J. D. KNOX

Steel Plant Editor, STEEL

■ LAST WEEK various mill towns around the Pittsburgh district were visited and wherever possible a conversation was opened with men—steel men, men who handle the controls up in the pulpits in rolling mills, men who ore down heats in the open-hearth shop, men who still carry a dinner pail packed by the Mrs., regardless of their occupation over in the mill.

To avoid being lopsided stops were made at a few works administration buildings to get a slant on what top management is thinking. Conversation invariably centered around the outcome of the presidential election and its relation to steel operations in the next few months.

Men spoke freely and some of their opinions are set down hereinafter though not in the same language as originally spoken. The emphasis may not be as strong as when spoken in steel mill parlance

but the gist is retained and from it the general pulse of the thoughts of men throughout the mill or of those sitting on leather covered swivel chairs directing company policies can be discerned.

One fellow who works in the electric gang told me he would like to have been a mouse in some of the thickly carpeted offices high up in the metropolitan buildings when some of the big boys arrived the morning after the election. What a headache they must have had when they got a glimpse of the votes cast in the counties where steel plants are located in such states as Indiana, Ohio and Pennsylvania, he went on to say, but how fickle is human nature.

"How can men in plants like this one," he said pointing with his left index finger to the various buildings within the plant enclosure, "bite the hand that's feeding them. Here's my company that for many years

has been spending thousands of dollars—yes, millions—on employe welfare, on employe representation, and on pensions, and on plant improvement. Other companies have heavy expenditures along this line as well. Yet thousands of men enjoying the privileges made possible by the expenditures of these companies go to the polls and cast a vote for regimentation just because some dude who never ate out of a dinner pail tells them to do it."

He was interrupted to explain what he meant by his use of the term regimentation.

"Brother, it doesn't take any explanation," he said. "Awhile back the word is passed around that your wage is going to be so much. Did the boys at the front office fix it? You don't have to reply, Buddy, the answer is 'No.'"

Orders from Washington

Continuing he said: "They tell you that your presence in the plant is not desired until it comes time for the turn to start. Is this the kind of rule that the company officials tacked up on the bulletin boards scattered over the plant? It is not. They let it be known that a guy can only work eight hours a day and 40 hours a week. Did the boys up at the front office put this plan into effect? Sure they did but only when they were told to do so by the boys down where the cherry blossoms bloom, where everyone hails you as 'My friend'. That's the kind of dope I mean when I speak of regimentation. The fellows out in the shop are working under it but they don't seem to recognize it though."

Just to illustrate how shallow-seated the talk of present day conditions are in the minds of some workmen, consider the following conversation with a colored man who has just finished his "trick" in the pickling department, and his friend.

"Howya, Sam. What ya saying, boy?"

"O.K., Slim. Howya doin'?"

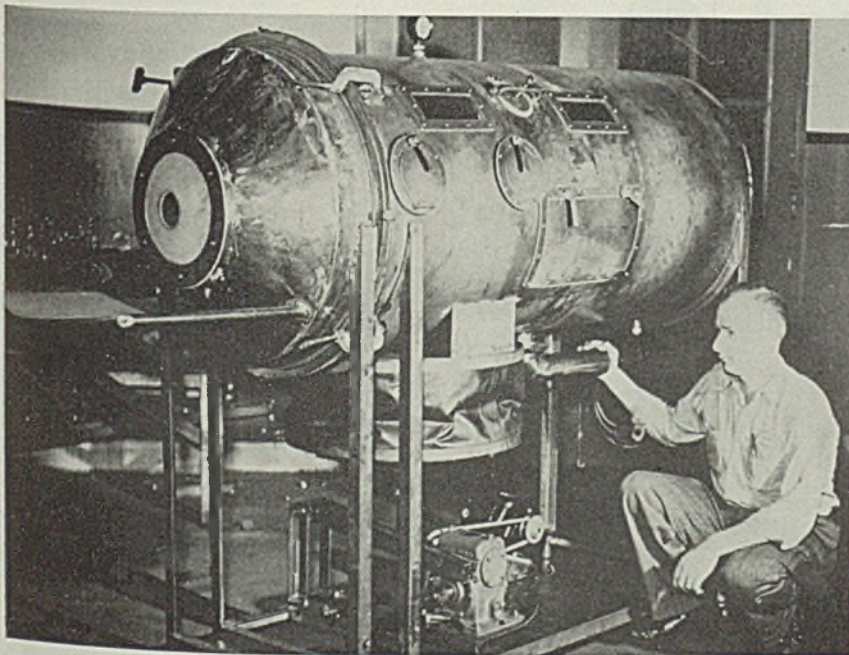
After one of the colored men learned where his friend was working he inquired, "De 'lection goin' to kick yo' job out from under you? Howya like 'lection, anyway?"

"All right with me, ah guess," was the reply. "The ol' lady and me gotta 'nough to eat. She gotta job; ah gotta job. What's da use kickin'. Naw, I'se not complainin', we's got dem ol' picklin' machines a bobbin' up and down and ah hears say that we gotta 'nough orders to keep us goin' for long time. Naw, I'se got no kick comin' from de 'lection."

While in conversation with a top executive, it so happened that workmen at his plant began to change

(Please turn to Page 98)

Welded "Iron Lung" Completed in 28 Hours



■ This mechanical respirator was made by 30 volunteer workers in the Post Products Co. plant in Grand Rapids, Mich., in 28 hours to save the life of the son of a fellow employe. The child had been stricken with infantile paralysis and no "iron lung" was available in the state. The father's co-workers copied structural details from a standard respirator, cut parts from 14-gage metal and arc welded the pieces together. Wires, valves, gages and motors were installed and the unit completed three days before the disease reached the crucial stage.

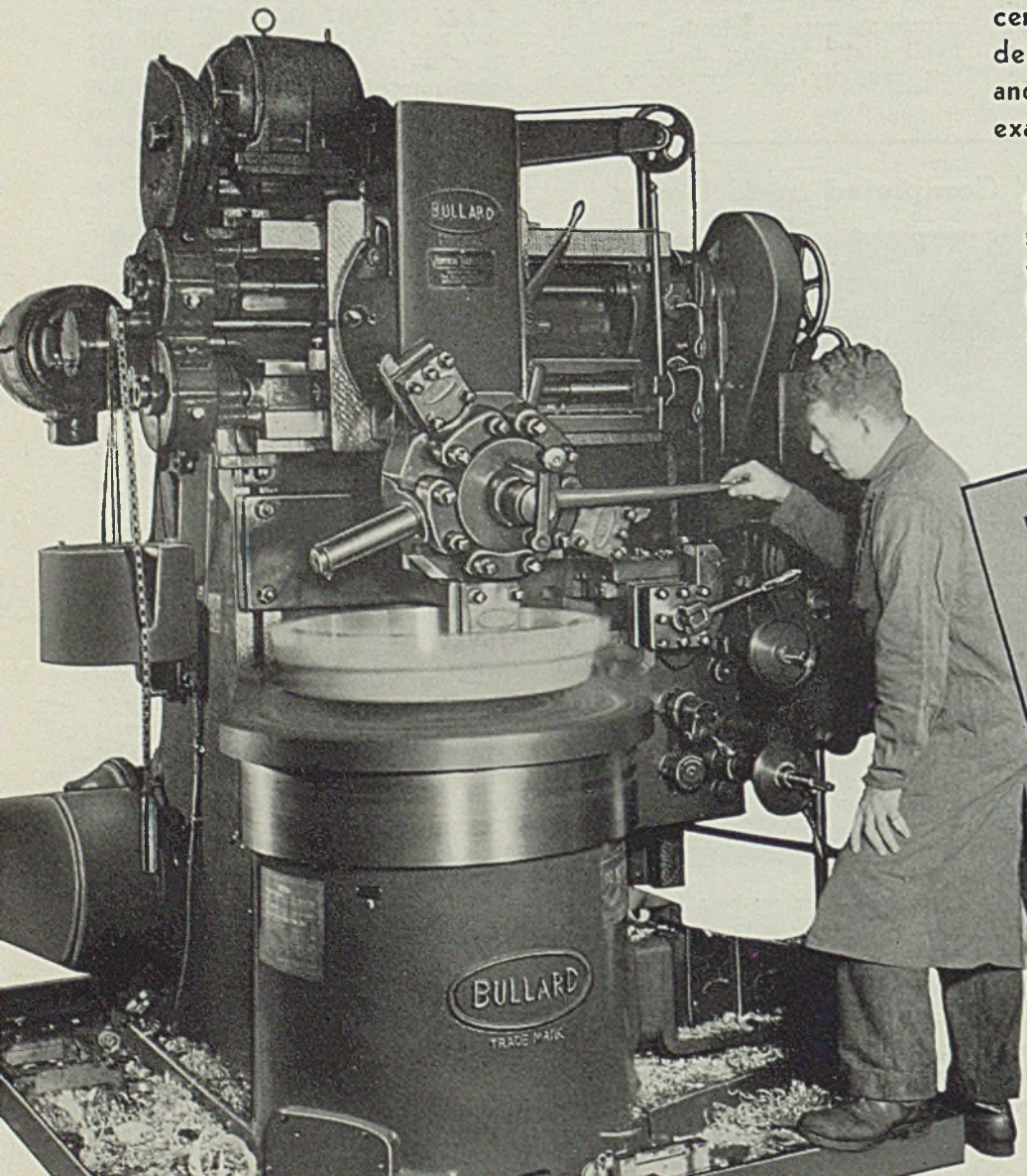
Photo, courtesy, Lincoln Electric Co., Cleveland



That old song always reminds us of a Vertical Turret Lathe, because the two sledge swingers working together are a little like the way the vertical and side heads of a Vertical Turret Lathe operate at the same time on a chucked part.

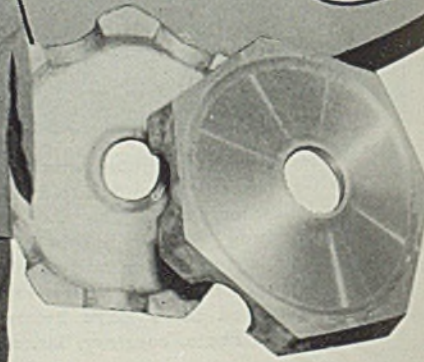
This thoroughly sound principle has been brought to its finest development in the Bullard Vertical Turret Lathe, long recognized as a standard machine tool for many types of work by the railroads, by the motor industry, by numberless miscellaneous manufacturers and most recently by the aircraft industry—whose demands for heavy metal cutting ability and sustained accuracy are the most exacting ever known.

Bullard Vertical Turret Lathes are made in 24", 36", 42", 54" capacities. The illustration shows a 36" High-Speed model machining an aeroplane motor crankcase.



**THE BULLARD
COMPANY**
BRIDGEPORT, CONN.

BULLARD



Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Packard Marine Engine Precision Astonishes Experts.

Rush Construction on Rolls-Royce Engine Plant.

Skilled Labor Shortage Will Develop Next Summer.

Navy Men Trained in Torpedo Boat Operation.

DETROIT

BLASE gasoline engine experts are drawing gasps of amazement as they inspect the precision inwards of Packard's 1350-horsepower marine engine, now being built in the Packard "M" division at a rate of two units every three days. Until recently activity in this division had been kept under cover, but in the past week or two a few privileged visitors have been shown through the plant.

Facilities are being expanded as rapidly as possible to permit a production rate of three engines per day. Working force includes 495 hourly rate men, 40-50 apprentices and 28 salaried employees. Ninety-three of the V-12 engines had been delivered as of last week and orders for some 700 more are on hand, for delivery to the navy department, to Canada and to Great Britain. The engines are used to power the navy's torpedo boats of the PT10 type, the latter using three engines per boat.

An idea of the size of the engine can be realized from the size of the pistons—6-inch diameter—and the weight of the six-throw forged alloy steel crankshaft—about 175 pounds. Cylinder barrels are machined from forged steel blanks and are bolted to the sand cast aluminum crankcase. Cylinder heads also are aluminum castings, as are crankcase pans. All steel parts, such as crankshaft, cylinder barrels, rods, camshaft and the like are machined and ground over their entire surface, and are beautiful examples of steel finishing.

Unusual feature of the crankshaft, and one tending to reduce its weight appreciably, is that the

crankpins and main bearings are bored out and the cranks angularly drilled for lubrication passages. In assembly light alloy plugs are fitted into either end of the hole in the pins and bearings, drawn up by bolts and tightly sealed against leak of lubricant.

After the engines are assembled on stationary cradles which can be rotated and locked in any one of eight positions, the unit is given a test run of 10 hours and is then returned to a "teardown" department where it is completely disassembled and every part minutely inspected before reassembly and final test. This procedure is in accordance with manufacturing practice for all aircraft engines and in fact Packard will use its marine engine division as a sort of training ground or pilot plant for procedures to be employed in the Rolls-Royce engine program.

Labor Shortage Likely

Many of the skilled machinists, grinders, inspectors and assemblers for the Rolls-Royce plant will be trained in the present "M" division. Apprentice training classes now being conducted will supply additional workmen. However, with 13,000 men needed when the Rolls plant is up to full production, there will still be a shortage of skilled help, and this is a problem which is causing Packard no little worry. Already it seems likely about 4000 of the 10,000 men now employed on automotive work will have to be transferred to the Rolls program,

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and thousands more will need to be recruited from the outside eight or nine months hence. Many of those to be transferred are men with 10 or 15 years experience at Packard, and should provide a valuable nucleus around which to build the full working force.

Preliminary studies of unemployment in this area indicates about 120,000 men out of work, and only about one out of ten of these can be considered "employable" for this type of work. This means a total available supply of 12,000 men to be drawn from, and with the Ford, Chrysler, Murray, Briggs and other defense program activities also draining this reservoir, the pinch is really going to be felt next summer when it comes to manpower.

These bridges will be crossed when the time comes. Meanwhile, construction is being rushed on 594,356 square feet of new plant space at Packard, supplementing the present 3,100,000 square feet devoted to car manufacturing. The Rolls-Royce engine program will require a total of 1,059,438 square feet, indicating that 465,082 square feet of present space must be given over to the aircraft engine development.

New construction involves a four-story office and administration building, backed up by an 85,000-square foot assembly building, scheduled for completion by Feb. 1; a test and teardown building containing 40 test cells and space for tearing down and inspecting engines after first test runs; and a new plant for machining and heat treating, covering 119,187 square feet, to be completed in April.

The test cells in the teardown building are estimated to cost about \$50,000 each, of which \$10,000 is for soundproofing. Propeller and engine noise, calculated to average around 140 decibels, will be muffled down to 70 decibels, avoiding the necessity of locating these test cells far out in the country where the noise would be unobjectionable.

First three experimental, hand-

built Rolls engines are expected to be finished by March 15, with six more completed by July 15. By Aug. 15, the company expects to have the first 15 engines ready for shipment and to have enough equipment erected and in operation to bring production rate to six per day.

Returning to the marine engine program for a moment, one little known activity is the school which Packard engineers are conducting for the navy department in which a small group of navy men is being given a three-week training course in technical details of design and operation of the engine and the boats in which they are used. Later this training program will be expanded to provide a thoroughly schooled personnel to man the fleet of torpedo boats to be built by the United States.

■ THAT this city really is going "bugs" on aircraft engines was proved by the turnout last Monday of over 300 metallurgists at a meeting of the American Society for Metals to hear R. R. Moore, chief metallurgist, Naval Aircraft Factory, Philadelphia, discuss aircraft metallurgy as it applies to radial engines in particular.

He prefaced his remarks by pointing out that aircraft engines have progressed steadily in weight-to-power ratio from 1922 when the best average was 2½ pounds per horsepower to the present day when some 1000-horsepower approved engines have been reduced to 1.1 pounds per horsepower. This reduction has been achieved mainly

by increasing the horsepower rather than by cutting weight. Higher compression ratios, higher speeds, better cooling and leaded gasoline have been contributing factors in increasing power.

Weight of the average radial en-

formance and fabrication details, uniformity, depth of hardening, tendency to warp, forgeability, machinability and the like.

Citing same specific choices, Mr. Moore mentioned that for studs and small fittings requiring tensiles of 170-175,000 p.s.i., S.A.E. 2330, 3140, 4140 and 6150 steels, heat treated, were used.

For small forgings, rocker arms, smaller connecting rods: S.A.E. 2330 or 2340.

For larger forgings, crankshafts, connecting rods: 4340, 4345, 4150, because of deep hardening characteristics, good Izod impact values and freedom from quenching cracks.

Aircraft carburizing steels include 3115, 3312, 2512 and 4615. The 2512 is considered good for highly stressed parts, although some builders prefer 3312 because of its better machinability.

For valve springs, the choice includes music wire given a half-hour draw at 500 degrees, or S.A.E. 6150 wire, quenched and drawn to 200,000 p.s.i. tensile.

Automobile Production

Passenger Cars and Trucks—United States and Canada

| By Department of Commerce | | | |
|---------------------------|-----------|-----------|-----------|
| | 1938 | 1939 | 1940 |
| Jan..... | 226,952 | 356,692 | 449,492 |
| Feb. | 202,597 | 317,520 | 422,225 |
| March... | 238,447 | 389,495 | 440,232 |
| April.... | 237,929 | 354,266 | 452,433 |
| May..... | 210,174 | 313,248 | 412,492 |
| June.... | 189,402 | 324,253 | 362,566 |
| July..... | 150,450 | 218,494 | 246,171 |
| Aug..... | 96,946 | 103,343 | 89,866 |
| Sept.... | 89,623 | 192,678 | 284,583 |
| 9 mos.... | 1,642,520 | 2,570,370 | 3,160,060 |
| 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† |
|---------------|---------|--------|
| Oct. 19 | 114,672 | 70,114 |
| Oct. 26 | 117,080 | 78,210 |
| Nov. 2 | 118,092 | 82,690 |
| Nov. 9 | 120,948 | 86,200 |
| Nov. 16 | 121,943 | 86,700 |

†Comparable week.

gine in use today breaks down into about one-half light alloys and one-half alloy steel, with perhaps 1 to 2 per cent bronze. Selection of steels for aircraft engines depends on many factors beyond the mere S.A.E. number. They include per-

Beryllium Bronze Used

For valves and valve seat inserts a 14 per cent nickel, 14 chrome and 2.5 tungsten steel has been adopted generally. Valve tips and seats are Stellite to improve wear; stems are nitrided. Valve seat inserts of aluminum bronze or beryllium bronze have proved effective.

Exhaust stacks and collector rings have been found most serviceable and best appearing if made of 18-8 chrome-nickel steel with a stabilizer added. These parts are welded and cracks at the welds can be avoided by heating the part at 1950 degrees and air cooling.

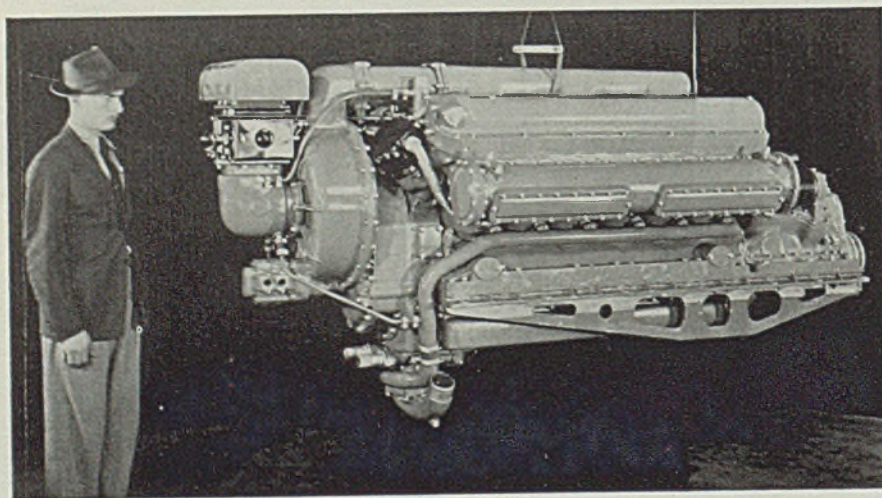
Two aluminum alloys, found excellent for use in cylinder heads for radial engines, are one with 4 per cent copper, 2 nickel and 1.5 magnesium; and one with 10 copper, 1.2 iron and 0.2 magnesium. Greatly improved cooling of these heads has been accomplished by making fins deeper and more closely spaced, some today being 1½ inches deep and with less than ¼-inch pitch.

Pistons generally are of forged aluminum, this material having been found more reliable than cast aluminum because of freedom from blowholes, dross and similar defects, although it was admitted that forgings still are susceptible to cold shuts, laps, cracks and blisters, requiring unceasing vigilance on inspection.

Crankcases are called upon to withstand severe stresses in these engines and aluminum forgings are used widely, supplying yield strength of 35,000 p.s.i., tensile of 48,000 and elongation of 14 per

(Please turn to Page 100)

Power for Uncle Sam's Torpedo Boats



■ Packard's 1350-horsepower marine engine. Main engine elements are of sand cast aluminum alloy, except for cylinder barrels, crankshaft, camshaft, connecting rods, valves, etc., which are alloy steel, finish ground on all surfaces

WISCONSIN PICKS TORRINGTON NEEDLE BEARING

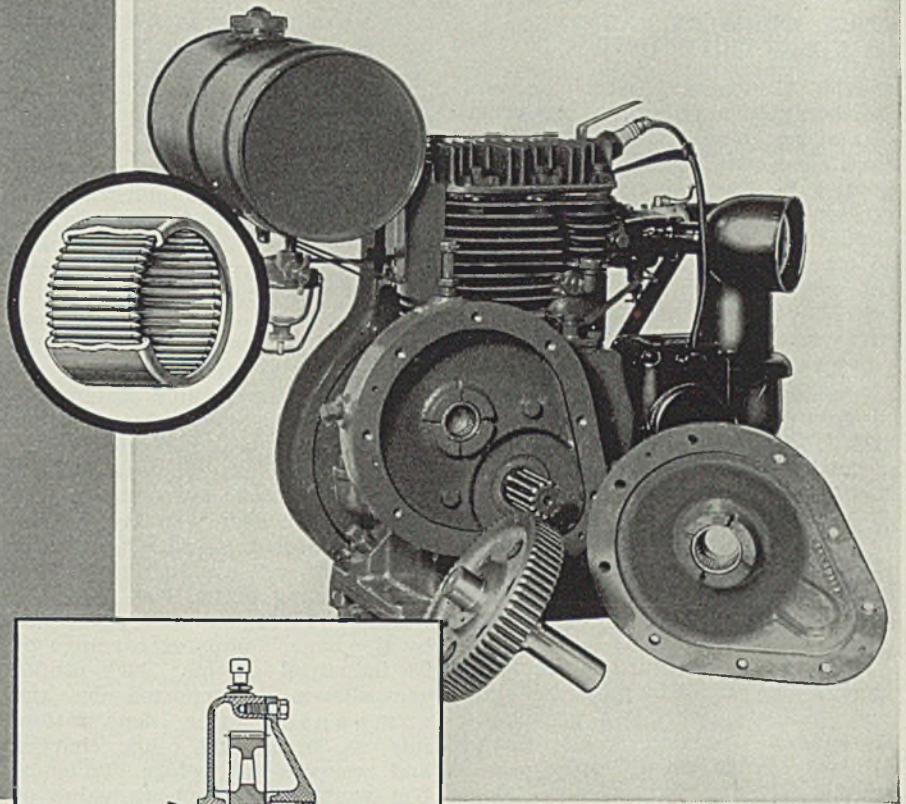
FOR SMALL SIZE &
HIGH CAPACITY

GETS COST REDUCTION
AND SERVICE
RECORD AS WELL

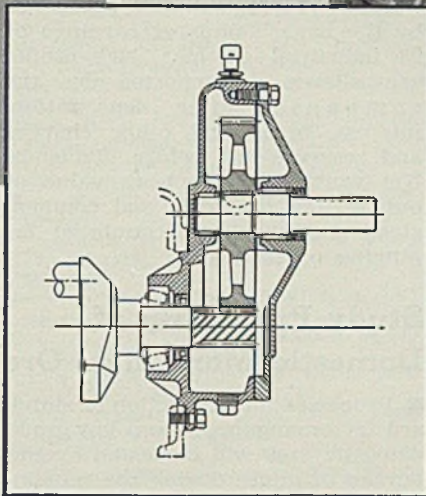
FOR the reduction gear assembly of its famous air-cooled Model AB gasoline engine, the Wisconsin Motor Company selected the Torrington Needle Bearing for *small size and high capacity*. And, in addition, they secured two other important advantages—*reduction in machining and assembly costs*, and a *service record of no bearing failure in 1,800 installations*.

"We adopted the Torrington Needle Bearing," says A. H. Wehmeyer, Assistant Chief Engineer, "because in our gear reduction unit, the center between the main take-off shaft and the engine crankshaft was so close that it meant the use of a bearing with minimum radial thickness and at the same time a high load capacity.

"And," adds Mr. Wehmeyer, "since the Needle Bearing has these qualities, and required a minimum diametrical bore for installation, we cut down the machining and assembly cost. As far as service is concerned, we have shipped out 1,800 reduction unit installations on the en-



(Above) Disassembled gear reduction housing on the Model AB WISCONSIN air-cooled industrial engine illustrates how two Needle Bearings contribute to long, trouble-free anti-friction performance.



(Left) Cross-section shows how readily the Torrington Needle Bearing adapts itself to compact design.

gine, and, to date, *have not received one complaint due to bearing failure.*"

Performance like this is typical of the Torrington Needle Bearing—for it is engineered for long life under severe conditions. And its ready adaptability to product design is another characteristic. Because of its simple construction, small diameter and long axis, its ease of assembly and lubrication; it introduces no design complications. In fact, it frequently offers opportunities for simplification in the design of surrounding

members, with consequent savings in space, weight and cost.

The Torrington Engineering Department will gladly work with you in adapting the advantages of the Needle Bearing to your product. For further information write for Catalog No. 10. For Needle Bearings to be used in heavier service, request Booklet 103X from our associate, the Bantam Bearings Corporation, South Bend, Ind.

The Torrington Company
ESTABLISHED 1866
Torrington, Conn., U.S.A.

Makers of Needle and Ball Bearings

New York Boston Philadelphia Detroit
Cleveland Chicago London, England

TORRINGTON NEEDLE BEARING

FINANCIAL

STEEL INDUSTRY EARNINGS 3 1/4 TIMES THOSE OF 1939

■ STEEL industry's return on net worth in first nine months this year was at an annual rate slightly less than 7 per cent, according to a compilation by the National City Bank of New York. United States Steel Corp.'s rate was 7 per cent; that of 25 other iron and steel companies, 6.9 per cent. In the period last year, U. S. Steel's annual rate of return was 1.3 per cent, against 3 per cent for the other 25.

The industry's net earnings rate in first three quarters compared with 10.8 per cent, average rate of return for the period of 291 leading manufacturing corporations in 18 industrial groups, including steel. It was the lowest return on net worth of all the groups listed excepting petroleum products, which earned an average return of 6.7 per cent.

Highest rate of return in the nine months was earned by the drugs and soap industry, with 20.4 per cent. Automobile builders, other than General Motors Corp., ran a close second, 19.7 per cent. General Motors' rate of return was 16.3 per cent. Miscellaneous metal products manufacturers and automobile equipment fabricators also had relatively high rates of return, 17.3 per cent and 15.2 per cent respectively.

Greatest increase in profits over first three quarters last year was reported by the 26 major steel companies, whose aggregate net profit in the nine months was more than three

and a half times as great as in the period in 1939. Building equipment manufacturers' profit was slightly more than doubled; railway equipment fabricators' aggregate net income increased about two and a half times and paper products manufacturers' about three times.

In the nonmanufacturing industries, including 59 companies and five groups, mining and quarrying reported largest rate of return on net worth, 14.4 per cent, in the nine months. Lowest was coal mining with 0.8 per cent. Average annual rate of return of the 350 corporations was 10.4 per cent, against 7.4 per cent in the period last year.

Third quarter earnings statements of the same 350 companies show, in the aggregate, a 14 per cent decline in net income from this year's second quarter. Increase over third period last year, however, was 23 per cent. Their profit in the first nine months was 42 per cent greater than in the corresponding period last year.

Accompanying summary, prepared by the bank, compares earnings of 23 industrial groups. Net profits are shown as reported by the companies, after depreciation, interest, taxes and other charges and reserves but before dividends. Net worth includes book value of outstanding preferred and common stock and surplus accounts at beginning of each year.

Study Processing of Domestic Manganese Ore

■ Processes for production of standard ferromanganese from low-grade domestic ores will be tested by the bureau of mines during the remain-

der of the current fiscal year. Congress recently appropriated \$2,000,000 for this purpose and the bureau will use this to start construction and field work.

Little information is available from the bureau as plans are still in the formulative stage. It is understood, however, the experiments will be conducted at Rolla, Mo., Minneapolis, Boulder City, Nev., and Salt Lake City, Utah, in the bureau's present experimental stations. Some additional construction work will be necessary.

Bureau officials have said they will test all available processes.

Warner & Swasey Co. Observes Guest Day

■ Warner & Swasey Co., Cleveland, set apart Friday, Nov. 15, as guest day. Several hundred customers, stockholders and other friends, by special invitation, were received by officials and conducted through the plant. Manufacture of turret lathes and tooling equipment continued throughout the day.

On the following day, the annual open-house for the 2500 employees and their families was held at the plant.

A feature of special interest was the addition, recently completed, into which workman and machines have just been moved. The addition practically doubles the length of the heavy machining and assembly shop. This part of the plant has heavy traveling cranes running its entire length.

In order that full advantage might be taken of this and other additional floor space, a complete new production layout was made to provide most effective location of much additional equipment as well as for the logical relocation of practically all other equipment throughout the entire plant. This project has included rearrangement of the stockroom, to which a large basement extension has been built.

Visitors gained impressions of improved efficiency, especially that resulting from substantial increase in area of the ground level crane room. This permits straight-line flow of turret lathes in being assembled, tooled, tested and finished. Another thing of equal importance is that it has made room for location of planers and certain other heavy machining equipment on solid foundations close to the assembly line and close to the point where bed castings and other heavy parts enter the plant.

This arrangement eliminates costly and troublesome trucking and elevator lifting of these heavy parts during the course of machining and does away with their "back tracking" through busy production aisles after they have been machined.

Profits of Leading Corporations for First Nine Months

(In Thousands of Dollars)

| No. | Industrial Groups | Net profits Nine Months | | Per Cent Change† | Annual Rate of Return % | |
|-----|----------------------------|----------------------------|-----------|------------------------|----------------------------|------|
| | | 1939 | 1940 | | 1939 | 1940 |
| 8 | Baking | \$16,028 | \$13,791 | -14.0 | 8.5 | 7.5 |
| 16 | Food products—misc. | 60,187 | 56,418 | -6.3 | 12.9 | 11.9 |
| 11 | Textiles and apparel | 5,818 | 9,146 | +57.2 | 8.4 | 12.4 |
| 12 | Paper products | 3,913 | 10,523 | + .. | 3.7 | 9.8 |
| 17 | Chemical products | 105,004 | 127,929 | +21.8 | 11.9 | 14.0 |
| 8 | Drugs, soap, etc. | 27,650 | 25,923 | -6.2 | 21.9 | 20.4 |
| 14 | Petroleum products | 49,931 | 78,662 | +57.5 | 4.4 | 6.7 |
| 18 | Stone, clay and glass | 20,042 | 24,281 | +21.2 | 9.0 | 10.6 |
| 1 | Iron and steel—U. S. Steel | 12,391 | 69,418 | + .. | 1.3 | 7.0 |
| 25 | Iron and steel—other | 21,195 | 49,693 | + .. | 3.0 | 6.9 |
| 10 | Building equipment | 6,183 | 13,139 | + .. | 3.8 | 8.3 |
| 14 | Electrical equipment | 38,983 | 61,319 | +57.3 | 8.3 | 12.9 |
| 25 | Machinery | 11,098 | 21,222 | +91.2 | 6.3 | 12.5 |
| 7 | Office equipment | 10,815 | 12,773 | +18.1 | 9.7 | 11.3 |
| 11 | Railway equipment | 6,179 | 16,274 | + .. | 3.3 | 9.1 |
| 1 | Automobile—General Motors | 109,620 | 129,172 | +17.8 | 14.2 | 16.3 |
| 7 | Automobile—other | 31,120 | 33,925 | +9.0 | 19.4 | 19.7 |
| 21 | Auto equipment | 9,740 | 16,448 | +68.9 | 9.4 | 15.2 |
| 31 | Metal products—misc. | 16,545 | 31,460 | +90.1 | 9.9 | 17.2 |
| 34 | Misc. manufacturing | 13,139 | 17,537 | +33.5 | 6.1 | 8.3 |
| 291 | Total manufacturing | 575,581 | 819,053 | +42.3 | 7.8 | 10.8 |
| 10 | Coal mining | D-4,723* | 1,230* | .. | .. | 0.8 |
| 12 | Metal mining | 19,020* | 21,582* | +13.5 | 6.7 | 7.6 |
| 11 | Mining, quarrying—misc. | 12,471* | 15,264* | +22.4 | 11.8 | 14.4 |
| 15 | Trade (wholesale & retail) | 5,050 | 7,873 | +55.9 | 3.4 | 5.4 |
| 11 | Service and construction | 3,621 | 4,367 | +20.6 | 3.4 | 4.1 |
| 350 | Total | \$611,020 | \$869,369 | +42.3 | 7.4 | 10.4 |

D-Deficit. *Before certain charges. †Increases or decreases of more than 100 per cent not computed.

\$75,313,000 Aircraft Award Tops

Week's Defense Contracts

■ GOVERNMENT defense contracts reported last week by the war and navy departments aggregated \$102,816,482. Most awards were small, with navy department's contract to Consolidated Aircraft Corp., San Diego, Calif., for aircraft totaling \$75,313,000.74 the principal exception. Army's increasing preparations for housing, feeding, clothing and equipping the hundreds of thousands to be drafted have been evident the past several weeks in increased quartermasters' corps awards. War department announced the following:

Quartermaster Corps Awards

Alan-Lawrence Co. Inc., New York, temporary housing, Ft. Totten, New York, \$119,600.
American Seating Co., Grand Rapids, Mich., 200,000 metal folding chairs, \$330,000.
Autocar Co., Ardmore, Pa., tractor trucks, \$292,334.
Baker & Co., Boston, rehabilitation of buildings, Boston Harbor, Ft. Andrews, Ft. Strong, etc., \$145,473.
Bass, Joseph A., Co. & W. C. Smith Inc., Minneapolis, temporary housing, Savannah, Ill., ordnance depot proving ground, \$283,400.
Christopher Construction Co., Cleveland, increase to water distribution system, Ft. Custer, Michigan, \$48,365.89.
Clarin Mfg. Co., Chicago, 200,000 metal folding chairs, \$406,000.
Epp, Leo, San Francisco, cover for main supply reservoir, Presidio of San Francisco, \$40,377.
General Motors Corp., Chevrolet division, Detroit, trucks, \$850,363.59.
Glassell-Taylor Co., Shreveport, La., warehouse (shop), Barksdale field, Louisiana, \$101,970.
Haines & Haines, Dowagiac, Mich., gasoline filling stations at Ft. Custer, Michigan, \$6240.
Harris & McBarney, Jackson, Mich., increase to electrical distribution system, Ft. Custer, Michigan, \$49,884.94.
Herring-Hall-Marvin Safe Co., Hamilton O., 825 field safes, \$28,286.25.
Hyde, George H. Inc., Watertown, N. Y., warehouses, Madison barracks, New York, \$3256.
Jennings, J. O., Co., Louisville, Ky., temporary housing, Jeffersonville, Ind., QM depot, \$92,300.
Kimbrough Construction Co., Mobile, Ala., steel warehouses at Seima, Ala., and at Montgomery, Ala., municipal airport, \$30,756.
Kirk Building Co., Kansas City, Mo., signal corps warehouse, Patterson field, Ohio, \$77,700.
Merrill, R. D., Construction Co., Helena, Mont., temporary housing, Wendover field, Utah, \$159,572.
Owen-Ames-Kimball Co., Grand Rapids, Mich., temporary buildings, Ft. Custer, Michigan, \$2,078,815.
Pearson Construction Co., Benton Harbor, Mich., temporary buildings, Ft. Benjamin Harrison, Indiana, \$245,500.
Pittsburgh Des Moines Steel Co., San Francisco, elevated steel water tank, Salt Lake municipal airport, Salt Lake City, Utah, \$21,943.
Soper, Morris, Watertown, N. Y., utility system, Madison barracks, New York, \$24,632.44.
Southern Engineering & Architectural Co., Jacksonville, Fla., construction

work at cantonment camp, Tallahassee airport, Florida, \$1,020,605.
Turner, Lee T., Washington, comfort station, Arlington national cemetery, Virginia, \$17,127.
Weddle, E. E., Norfolk, Va., temporary housing, Virginia Beach, Va., \$118,634.
Westcott, Frank T., North Attleboro, Mass., additions to existing filtration plant for Ft. Monroe, Virginia, water supply system at Big Bethel, Va., \$28,890.
Wilkinson, J., Boston, electrical work, Ft. Wetherill and Ft. Getty, Rhode Island, \$25,355.
Yellow Truck & Coach Mfg. Co., Pontiac, Mich., trucks, with special bodies and equipment, \$2,682,434.90.
Yerlington & Getman Bros., South Haven, Mich., sewer pumping stations and force mains, Ft. Custer, Michigan, \$33,520.

Signal Corps Awards

Burke Electric Co., Erie, Pa., generators, \$67,932.
Connecticut Telephone & Electric Co., Meriden, Conn., test sets, \$49,327.04.
Continental Electric Co. Inc., Newark, N. J., generators, \$49,817.50.
Cook Electric Co., Chicago, switchboards, \$53,950.
Couch, S. H., Co. Inc., North Quincy, Mass., terminal strips, \$35,021.56.
Daven Co., Newark, N. J., components for remote control, \$124,396.20.
Eacor Inc., Chicago, dynamometer units, \$59,381.
Farnsworth Television & Radio Corp., Ft. Wayne, Ind., radio receivers, \$652,189.
Homelite Corp., Port Chester, N. Y., power unit, \$538,640.70.
R. C. A. Mfg. Co. Inc., Camden, N. J., radio receivers, \$187,166.
United States Electric Mfg. Corp., New York, flashlights, \$105,932.12.
United Transformer Corp., New York, radio filters, \$107,667.20.
Widn Metal Goods Co., Garwood, N. J., mast sections, radio sets, \$235,999.50.

Corps of Engineers Awards

Le Roi Co., Milwaukee, air compressors, \$976,500.

Chemical Warfare Service Awards

National Lead & Oil Co., Pittsburgh, tin lead solder, \$10,708.04.
Wolverine Supply & Mfg. Co., Pittsburgh, hose guards, \$9083.

Air Corps Awards

Bendix Aviation Corp., Eclipse Aviation division, Bendix, N. J., generator assemblies, \$60,258.20.
Coffing Holst Co., Danville, Ill., chain hoist, \$4537.
Dravo Corp., Cleveland, furnishing and installing piping system, exhaustor and blower, \$99,981.
Gosiger, G. M., Machinery Co., Dayton, O., chain hoist, \$10,028.
Harrington Co., Philadelphia, chain hoist, \$10,530.
Hayes Industries Inc., Jackson, Mich., wheel and brake assemblies, maintenance parts, \$77,940.23.
Heald Machine Co., Worcester, Mass., grinders, \$75,126.80.
Lufkin Sale Co., Saginaw, Mich., gages, \$14,020.72.
Reading Chain & Block Corp., Reading, Pa., chain hoist, \$40,950.
Ryerson, Joseph T., & Son Inc., Chicago, steel tubing, \$191,975.86.
Starrett, L. S., Co., Athol, Mass., gages, \$20,943.56.

United Aircraft Corp., Pratt & Whitney Aircraft division, East Hartford, Conn., maintenance parts, \$480,024.20.
Yale & Towne Mfg. Co., Philadelphia, chain hoist, \$56,700.

Ordnance Department Awards

Allegheny Ludlum Steel Corp., Brackenridge, Pa., gages, \$1920.
American Cutter & Engineering Co., Detroit, tools, \$38,570.50.
American Locomotive Co., Railway Steel-Spring division, New York, artillery materiel, \$1204.52.
Auto Ordnance Corp., Bridgeport, Conn., small arms materiel, \$3,108,854.61.
Barwood & Co., Philadelphia, gages, \$4818.
Bausch & Lomb Optical Co., Rochester, N. Y., fire control equipment, \$58,152.23.
Briggs & Stratton Corp., Milwaukee, artillery ammunition components, \$276,250.
Brown & Sharpe Mfg. Co., Philadelphia, gages, \$824.18.
Budd Wheel Co., Detroit, artillery ammunition components, \$405,760.
Carter Carburetor Corp., St. Louis, artillery ammunition components, \$259,534.
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, grinding machines, \$4113.
Coll's Patent Fire Arms Mfg. Co., Hartford, Conn., small arms materiel, \$2400.
Derbyshire Machine & Tool Co., Philadelphia, tools, \$4490.
Engstrom, O. L., New York, dies, \$1149.
Ex-Cell-O Corp., Continental Tool Works division, Detroit, cutters, \$2161.75.
Fidelity Machine Co., Philadelphia, tools, \$8950.
G. M. C. Mfg. Co., Long Island City, N. Y., artillery ammunition components, \$84,900.
General Tool & Mfg. Co., Irvington, N. J., tools, \$28,500.
Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$2056.09.
Jaeger Machine Co., Columbus, O., machinery, \$1374.40.
Modern Tool & Die Co., Philadelphia, gages, \$66,745.
Moore, J. W., Machine Co., Everett, Mass., gages, \$5620.
National Forge & Ordnance Co., Irvine, Pa., forgings, \$139,633.23.
Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., gages, \$2070.
Peters Engineering Co., Philadelphia, dies, \$5600.
Precise Tool & Mfg. Co., Farmington, Mich., gages, \$3394.
Prentiss, Henry, & Co. Inc., New York, machinery, \$9205.
Smith Bros. Mfg. Co., Findlay, O., artillery ammunition components, \$128,384.50.
Southern States Equipment Co., Birmingham, Ala., artillery ammunition components, \$440,534.
Sperry Gyroscope Co. Inc., Brooklyn, N. Y., fire control equipment, \$116,000.
Stevens Walden Inc., Worcester, Mass., tools, \$2278.66.
Stewart-Warner Corp., Chicago, artillery ammunition components, \$352,227.
Union Twist Drill Co., Athol, Mass., hobs, cutters, \$6033.23.
Vince Corp., Detroit, gages, \$245,900.
Warner Electric Brake Co., Beloit, Wis., artillery materiel, \$28,040.58.
Wiedemann Machine Co., Philadelphia, gages, \$47,320.50.

Navy department announced the following awards:

Agutter, J. J., & Co., Seattle, fire alarm and watchman's system, naval ammunition depot, Puget Sound, Washington, \$21,085.
American District Telegraph Co., San Francisco, burglar-proof cabinets and alarm system, office of inspector of naval material, San Francisco, \$2418.24.

Purchases Under Walsh-Healey Act

(In Week Ended Nov. 2)

Bolander, Eric, Construction Co., Libertyville, Ill., roads, walks and drainage for four new barracks, naval training station, Great Lakes, Ill., \$46,188.89.
 Nelson's, Frank, Sons, Philadelphia, equipment and piping in boiler room building No. 35, naval home, Philadelphia, \$10,800.
 Raymond Concrete Pile Co., New York, core borings at navy yard, New York, \$7500.
 Watson Elevator Co., New York, electric freight elevator, building No. 23, navy yard, New York, \$6204.

Bureau of Supplies and Accounts Awards

Acme Machine Tool Co., Cincinnati, turret lathe, \$6067.80.
 American Brass Co., Waterbury, Conn., copper-nickel alloy tubing, \$197,055.37.
 American-LaFrance-Foamite Corp., Elmira, N. Y., fire extinguishers, \$6237.84.
 Axelson Mfg. Co., Los Angeles, engine lathe, \$13,654.35.
 Baker-Raulang Co., Cleveland, electric truck, \$6442.
 Boston Insulated Wire & Cable Co., Boston, electric cable, \$5737.80.
 Bullard Co., Bridgeport, Conn., vertical boring mills, \$31,207.35.
 Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, vertical milling machine, \$8457.
 Circle Wire & Cable Corp., Maspeth, L. I., electric cable, \$5301.
 Consolidated Aircraft Corp., San Diego, Calif., airplanes, \$75,313,000.74.
 C-O-Two Fire Extinguisher Co., Newark, N. J., fire extinguishers, \$39,208.50.
 Crane Co., Chicago, valves, \$29,927.50.
 Crescent Truck Co., Lebanon, Pa., electric trucks, \$5243.
 Electric Storage Battery Co., Philadelphia, storage batteries, \$37,305.80.
 General Drop Forge Co. Inc., Buffalo, alloy steel forgings, \$10,801.
 General Electric Co., Schenectady, N. Y., heat and flame-resistant cable, \$13,068.
 Leland-Gifford Co., Worcester, Mass., sensitive drilling machines, \$13,860.
 Lodge & Shipley Machine Tool Co., Cincinnati, engine lathes, \$14,141.
 MacLane Hardware Co., New York, general purpose scoops and shovels, \$14,743.84.
 Mercury Mfg. Co., Chicago, electric trucks, \$34,906.80.
 Mine Safety Appliances Co., Pittsburgh, cutters "X" and cartridges, \$58,170.
 Okonite Co., Passaic, N. J., cable, \$12,284.40.
 Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire division, New York, cable, \$74,412.
 Pittsburgh Forgings Co., Coraopolis, Pa., alloy steel forgings, \$12,135.50.
 Prentiss, Henry, & Co. Inc., New York, drilling machines, \$29,408.94.
 Scovill Mfg. Co., Waterbury, Conn., copper-nickel alloy condenser tubes, cables, \$93,814.32.
 Steel Improvement & Forge Co., Cleveland, alloy steel forgings, \$6535.50.
 Storms Drop Forging Co., Springfield, Mass., nickel-copper alloy, steel forgings, \$21,389.40.
 Telephonics Corp., New York, radio head sets, \$41,300.
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., ranges, \$8128.50.
 Willard Storage Battery Co., Cleveland, storage batteries, \$52,146.50.
 Williams & Wells Co., New York, universal test indicators, \$30,366.
 Yale & Towne Mfg. Co., Automatic Transportation Co. division, Chicago, electric trucks, \$19,645.40.

Bureau of Yards and Docks Awards

Day & Zimmerman Inc., Philadelphia, bulkhead and hull, naval academy, Annapolis, Md., \$331,400.
 Slotnik, J., Co., Boston, 600 housing units, to be erected in vicinity of Kittery, Me., for the navy yard, Portsmouth, N. H., \$1,944,065.

Iron and Steel Products

Alircraft Hardware Mfg. Co. Inc., New York
 Allegheny Ludlum Steel Corp., Watervliet, N. Y.
 American Steel & Wire Co., Cleveland
 American Steel Foundries, Chicago
 Animal Trap Co. of America, Litzitz, Pa.
 Arguto Oilless Bearing Co., Philadelphia
 Bethlehem Steel Co., Bethlehem, Pa.
 Boston & Lockport Block Co., New York
 Camillus Cutlery Co., New York
 Carnegie-Illinois Steel Corp., Pittsburgh
 Carpenter Steel Co., Reading, Pa.
 Chicago Bridge & Iron Co., Birmingham, Ala.
 Christiana Machine Co., Christiana, Pa.
 Collins Co., Washington
 Columbia Steel Co., Provo, Utah
 Consolidated Steel Corp. Ltd., Los Angeles
 Crescent Tool Co., Jamestown, N. Y.
 Crucible Steel Co. of America, New York
 Darby Corp., Kansas City, Kans.
 De Long Hook & Eye Co., Philadelphia
 Doehrer Die Casting Co., Pottstown, Pa.
 Duffin Iron Co., Chicago
 Eastern Rolling Mill Co., Baltimore
 Ehrmeyer, John, t/a Abenell Co., Chicago
 Eladio Rodriguez Portela, Rio Piedras, P. R.
 Ellcott Machine Corp., Baltimore
 Ex-Cell-O Corp., Detroit
 Fisher-Pierce Co., Neponset, Mass.
 Ft. Pitt Bedding Co., Pittsburgh
 General Electric Co., Schenectady, N. Y.
 General Machinery & Supply Co., San Francisco
 Grabler Mfg. Co., Cleveland
 Harrisburg Steel Corp., Harrisburg, Pa.
 Hayes Mfg. Corp., Grand Rapids, Mich.
 Heintz Mfg. Co., Philadelphia
 Ingersoll-Rand Co., New York
 Islands Welding & Supply Co. Ltd., Honolulu, T. H.
 Jenkins Bros., Bridgeport, Conn.
 Jessop, William, & Sons Inc., Boston
 Jones & Laughlin Steel Corp., Pittsburgh
 Karp Metal Products Co., Brooklyn, N. Y.
 Keystone Steel & Wire Co., Peoria, Ill.
 Kirby Steel Co., Anniston, Ala.
 Larson Tool & Stamping Co., Attleboro, Mass.
 Leschens, A., & Sons Rope Co., St. Louis
 MacLane Hardware Co., New York
 Milburn, Alexander, Co., Baltimore
 Minneapolis-Honeywell Regulator Co., Minneapolis
 Moco-roa Arsuaga, M., Inc., San Juan, P. R.
 Muth, George F., Co. Inc., Washington
 National Tube Co., Chicago
 North American Iron & Steel Co. Inc., Brooklyn, N. Y.
 North & Judd Mfg. Co., New Britain, Conn.
 Parker Appliance Co., Cleveland
 Phillips & Davies Inc., Kenton, O.
 Pittsburgh Screw & Bolt Corp., Pittsburgh
 Pittsburgh Steel Co., Pittsburgh
 Porter, H. K., Inc., Everett, Mass.
 Prentice, G. E., Mfg. Co., New Britain, Conn.
 Pressed Steel Tank Co., West Allis, Wis.
 Purolator Products Inc., Newark, N. J.
 Reeves Steel & Mfg. Co., Dover, O.
 Republic Steel Corp., Cleveland
 Richmond Radiator Co. Inc., Uniontown, Pa.
 Sheffield Steel Corp., Kansas City, Mo.
 Southern Pipe & Casing Co., Azusa, Calif.
 Steel Improvement & Forge Co., Cleveland
 Struthers Wells-Titusville Corp., Titusville, Pa.
 Templeton, Kenly & Co., Chicago
 Truscon Steel Co., Youngstown, O.
 Union Metal Mfg. Co., Canton, O.
 United-Carr Fastener Corp., Cambridge, Mass.
 United States Electrical Tool Co., Cincinnati
 Universal-Cyclops Steel Corp., Bridgeville, Pa.
 Utica Cutlery Co., Utica, N. Y.
 Velt & Young, Philadelphia
 Vulcan Steel Products Co., Brooklyn, N. Y.
 Wagner, A. F., Iron Works, Milwaukee
 Weatherhead Co., Cleveland
 Youngstown Sheet & Tube Co., Youngstown, O.

| Commodity | Amount |
|---|-------------|
| Bolts | \$16,457.30 |
| Steel rods | *144,866.54 |
| Steel bars and rods | 27,089.18 |
| Volute springs | 21,250.00 |
| Coat hooks | 11,900.00 |
| Punches, dies | 16,085.00 |
| Forgings, reinforcement bars, steel rods, sluice liners | 311,372.85 |
| Blocks, tackle | 19,804.12 |
| Pocket knives | 35,849.64 |
| Molybdenum steel, steel, bars, forgings | 949,173.27 |
| Steel rods | 155,874.83 |
| Penstock liners | *38,000.00 |
| Cast-iron anchors | 14,908.58 |
| Machetes | 21,947.85 |
| Reinforcing bars | 20,283.75 |
| Inlet pipes | 13,900.00 |
| Wrenches, pliers | 81,964.92 |
| Steel rods, sheets, plates | 76,953.94 |
| Mine cases | 74,304.00 |
| Coat hooks | 16,540.00 |
| Die castings | 40,650.00 |
| Structural steel | 27,252.00 |
| Steel, sheets | 21,992.50 |
| Selector boxes | 27,994.40 |
| Steel sheets | 41,415.75 |
| Ladder, cutter | 54,820.00 |
| Drainage tanks | 13,562.50 |
| Fuse covers | 12,818.78 |
| Metallic belt links | 419,200.00 |
| Howitzers | 92,938.00 |
| Wrenches | 13,507.60 |
| Pipe fittings | 41,755.90 |
| Separators | 14,200.00 |
| Shells | 46,610.00 |
| Steel doors | 16,376.40 |
| Drills, heads | 16,786.50 |
| Ammunition boxes | 10,680.00 |
| Valves | 15,819.60 |
| Steel | 63,758.94 |
| Steel I-beams | *35,700.00 |
| Cabinet assemblies, boxes | 48,976.10 |
| Wire nails | *16,995.00 |
| Screw posts | 95,268.14 |
| Guards, valves | 13,347.04 |
| Wire rope | 15,812.00 |
| Miscellaneous supplies | 11,490.41 |
| Torches | 29,203.80 |
| Telescope mounts | 171,200.25 |
| Iron pipe | 10,931.79 |
| Slide rules | 10,841.00 |
| Steel tubing | 15,156.82 |
| Cargo booms | 15,636.00 |
| Loops, slides | 78,678.52 |
| Tube benders | 29,999.10 |
| Intake gates | 70,000.00 |
| Anchor bolts | 85,974.00 |
| Barbed wire | 44,611.50 |
| Wire cutters | 25,651.50 |
| Clasps | 28,050.40 |
| Shells | 47,470.00 |
| Filters | 10,392.10 |
| Cans and covers | 18,122.13 |
| Steel, steel rods | 32,333.23 |
| Cast-iron anchors | 42,704.52 |
| Bolts and nuts | 47,124.19 |
| Steel pipes | 35,889.21 |
| Forgings | 17,500.00 |
| Forgings | 127,000.00 |
| Ratchet jacks | 20,930.00 |
| Reinforcing bars | 10,040.00 |
| Pile shells | 27,166.92 |
| Brass fasteners | 169,214.06 |
| Electric drills | 20,911.50 |
| Steel rods | *145,115.88 |
| Tableware | 25,025.00 |
| Punches, dies | 15,630.00 |
| Fence | 25,576.08 |
| Grating and hand railing | 14,988.00 |
| Connectors | 21,208.93 |
| Nickel steel, wire netting | 139,146.00 |

*Estimated.

STEEL

Purchases Under Walsh-Healey Act (Cont.)

Canadian War Orders For Week \$7,271,763

TORONTO, ONT.

Nonferrous Metals and Alloys

| Commodity | Amount |
|--|--------|
| Aluminum Co. of America, Pittsburgh | |
| American Brass Co., Waterbury, Conn. | |
| American Metal Co. Ltd., New York | |
| Barium Reduction Corp., South Charleston, W. Va. | |
| Bart Laboratories, Belleville, N. J. | |
| Crane Co., San Diego, Calif. | |
| Crosby Co., Buffalo | |
| Kennecott Sales Corp., New York | |
| Kidde, Walter, & Co. Inc., New York | |
| Pennsylvania Smelting & Refining Co., Philadelphia | |
| Revere Copper & Brass Inc., Baltimore | |
| Scovill Mfg. Co., Waterbury, Conn. | |

Commodity

| | |
|-----------------------|--------------|
| Aluminum conductor | \$12,595.95 |
| Cartridge cups | 73,950.00 |
| Lead antimony alloy | 43,350.00 |
| Strontium peroxide | 103,750.00 |
| Mirrors | 84,000.00 |
| Brass pipe | 13,625.76 |
| Cartridge cases | 1,175,600.00 |
| Copper ingots | 74,100.00 |
| Fire extinguishers | 100,290.00 |
| Lead antimony alloy | 26,400.00 |
| Admiralty metal tubes | 21,285.61 |
| Cartridge cups | 32,850.00 |

Machinery and Other Equipment

| | |
|---|--|
| All's-Chalmers Mfg. Co., Milwaukee | |
| American Laundry Machinery Co., Cincinnati | |
| American Sheet Metal Works Inc., Portland, Oreg. | |
| American Tool Works Co., Cincinnati | |
| Axelson Mfg. Co., Los Angeles | |
| Blaw-Knox Co., Pittsburgh | |
| Bliss, E. W. Co., Brooklyn, N. Y. | |
| Borg Warner Corp., Rockford Drilling Machine division, Rockford, Ill. | |
| Brown & Sharpe Mfg. Co., Providence, R. I. | |
| Bucyrus-Erie Co., South Milwaukee, Wis. | |
| Bullard Co., Bridgeport, Conn. | |
| Caterpillar Tractor Co., Peoria, Ill. | |
| Cincinnati Milling Machines & Cincinnati Grinders Inc., Cincinnati | |
| Clark Equipment Co., Buchanan, Mich. | |
| Cleveland Tractor Co., Cleveland | |
| Cone Automatic Machine Co. Inc., Windsor, Vt. | |
| Consolidated Machine Tool Corp., Rochester, N. Y. | |
| Ellicott Machine Corp., Baltimore | |
| Essley, E. L., Machinery Co., Chicago | |
| Gallon Iron Works & Mfg. Co., Gallon, O. | |
| Gardner-Denver Co., Quincy, Ill. | |
| General Motors Corp., Diesel Engine division, Cleveland | |
| Gleason Works, Rochester, N. Y. | |
| Guiberson Diesel Engine Co., Dallas, Tex. | |
| Harnischfeger Corp., Milwaukee | |
| Harris, R. L., Inc., Knoxville, Tenn. | |
| Harvey Metal Corp., Chicago | |
| Hill, C. V., & Co. Inc., Trenton, N. J. | |
| Hussmann-Ligonier Co., St. Louis | |
| Ingersoll-Rand Co., New York | |
| International Harvester Co., Chicago | |
| Jones & Lamson Machine Co., Springfield, Vt. | |
| Kearney & Trecker Corp., Milwaukee | |
| Knight, W. B., Machinery Co., St. Louis | |
| Koehring Co., Milwaukee | |
| LeBlond, R. K., Machine Co., Cincinnati | |
| Lloyd & Arms Inc., Philadelphia | |
| Lodge & Shipley Machine Tool Co., Cincinnati | |
| Marion Steam Shovel Co., Marion, O. | |
| Monarch Machine Tool Co., Sidney, O. | |
| National Engineering Co., Chicago | |
| Niles Cement Pond Co., Pratt & Whitney division, West Hartford, Conn. | |
| Ohio Locomotive Crane Co., Bucyrus, O. | |
| Osgood Co., Marion, O. | |
| Paasche Airbrush Co. Inc., Chicago | |
| Pangborn Corp., Hagerstown, Md. | |
| Pirsch, Peter, & Sons Co., Kenosha, Wis. | |
| Prentiss, Henry, & Co. Inc., New York | |
| Rockford Machine Tool Co., Rockford, Ill. | |
| Simmons Machine Tool Corp., Albany, N. Y. | |
| Singer Sewing Machine Co., New York | |
| Star Iron & Steel Co., Tacoma, Wash. | |
| Stedfast & Roulston Inc., Boston | |
| Swind Machinery Co., Philadelphia | |
| Tyler Fixture Corp., Niles, Mich. | |
| Underwood Elliott Fisher Co., New York | |
| Universal Crusher Co., Cedar Rapids, Iowa | |
| Vandyke Churchill Co., Philadelphia | |
| Wallace & Tiernan Co. Inc., Belleville, N. J. | |
| Warner & Swasey Co., Cleveland | |
| Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. | |
| Watson Stillman Co., Roselle, N. J. | |
| Weber Showcase & Fixture Co. Inc., Los Angeles | |
| Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. | |
| Yale & Towne Mfg. Co., Automatic Transportation Co. division, Chicago | |
| York Safe & Lock Co., York, Pa. | |
| Youngstown Miller Co. Inc., Sandusky, O. | |

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|-----------------------------|----------------|
| Tractors | \$1,196,409.00 |
| Laundry equipment | 30,289.00 |
| Mill exhaust system | 18,760.00 |
| Lathes | 232,126.00 |
| Lathe | 13,576.00 |
| Road construction equipment | 20,472.00 |
| Bodymakers | 30,605.00 |
| Clutch parts | 19,711.75 |
| Screw machines | 74,695.51 |
| Shovels, crane | 136,287.20 |
| Boring mill | 17,633.00 |
| Crane | 11,202.36 |
| Milling machines | 29,092.00 |
| Tractors | 743,457.50 |
| Tractors | 93,760.85 |
| Screw machine | 20,065.00 |
| Lathes | 487,165.00 |
| Pumps | 18,692.00 |
| Honing equipment | 17,539.40 |
| Graders | 11,885.00 |
| Air compressors | 20,939.70 |
| Engine parts | 16,198.98 |
| Cutting machine | 45,547.00 |
| Diesel engines | 2,933,345.86 |
| Crane, power shovel | 49,641.00 |
| Tractors | 27,654.00 |
| Machining forgings | 245,030.00 |
| Refrigerators | 283,500.00 |
| Refrigerators | 307,650.00 |
| Air compressors | 14,855.00 |
| Tractors | 2,305,373.54 |
| Lathes | 118,606.00 |
| Milling machines | 40,866.30 |
| Boring machines | 24,298.00 |
| Paver | 24,013.91 |
| Lathes | 105,759.00 |
| Drilling machines | 16,997.00 |
| Lathes | 285,976.00 |
| Shovels | 40,305.00 |
| Lathes | 18,204.00 |
| Mixing machine | 14,701.00 |
| Machines, shapers, | 47,824.85 |
| Crane | 18,325.00 |
| Crane | 10,531.00 |
| Drying units | 10,217.76 |
| Shot blasting equipment | 12,456.00 |
| Pumping engines | 11,683.00 |
| Boring mill, grinders | 43,429.00 |
| Planer | 22,250.00 |
| Lathes | 29,880.00 |
| Sewing machines | 113,410.25 |
| Gantry cranes | 105,380.00 |
| Boring mill | 31,706.40 |
| Boring machine | 24,160.50 |
| Refrigerators | 88,560.00 |
| Accounting machines | 31,064.00 |
| Cradle assemblies | 92,400.00 |
| Boring mill | 31,655.00 |
| Water purification units | 95,710.53 |
| Lathes | 183,645.00 |
| Machines | 17,000.00 |
| Presses | 49,400.00 |
| Refrigerators | 388,150.00 |
| Turbine parts | 11,794.78 |
| Electric crane | 10,500.00 |
| Cradle assemblies | 66,945.75 |
| Reclaimers | 13,491.00 |

■ Hydro-electric power developments in Ontario to cost \$12,000,000 have been approved by the provincial cabinet, it was announced last week by Dr. T. H. Hogg, Toronto, chairman of the power commission.

The Dominion government will build a \$3,000,000 factory at London, Ont., to build airplanes, principally trainers.

Last week the government announced 1649 war material contracts, aggregating \$7,271,763. Orders include:

Shipbuilding: North Sydney Marine Railway Co. Ltd., North Sydney, N. S., \$11,278; Halifax Shipyards Ltd., Halifax, N. S., \$29,422; General Supply Co. of Canada Ltd., Ottawa, Ont., \$55,212.

Instruments: Air ministry, England, \$30,000; war office, England, \$5250; Instruments Ltd., Ottawa, \$45,070; J. F. Hartz Co. Ltd., Toronto, \$12,372.

Mechanical transport: International Harvester Co. of Canada Ltd., Ottawa, \$5530; Truck Engineering Ltd., Woodstock, Ont., \$59,265.

Aircraft: Air ministry, England, \$12,960; Aviation Electric Ltd., Montreal, Que., \$64,598; Dominion Hoist & Shovel Co. Ltd., Montreal, \$13,900.

Electrical equipment: War office, England, \$8060; R.C.A. Victor Co. Ltd., Montreal, \$8376; Canadian General Electric Co. Ltd., Ottawa, \$63,191; Crouse-Hinds Co. of Canada Ltd., Toronto, \$15,396; Exide Batteries of Canada Ltd., Toronto, \$96,457.

Machinery: Dominion Hoist & Shovel Co. Ltd., Montreal, \$46,170; Williams & Wilson Ltd., Montreal, \$5678; Canadian Ingersoll-Rand Co. Ltd., Montreal, \$5961; Canadian Fairbanks-Morse Co. Ltd., Ottawa, \$14,136; International Harvester Co. of Canada Ltd., Ottawa, \$12,538.

Tools: Canadian Pratt & Whitney Aircraft Co. Ltd., Longueuil, Que., \$16,013.

Munitions: Anaconda American Brass Ltd., West Toronto, Ont., \$34,280.

Miscellaneous: Dominion Rubber Co. Ltd., Ottawa, \$43,000; Enamel & Heating Products Ltd., Sackville, N. B., \$6913; Moffats Ltd., Weston, Ont., \$6913; E. G. M. Cape & Co., Montreal, \$67,000; John Playton, Winnipeg, Man., \$42,000; Ernest A. Jones, Leaside, Ont., \$81,000; W. E. Emerson & Sons, West St. John, N. S., \$72,000; M. F. Schurman, Summerside, P.E.I., \$132,000.

Construction: Anglin-Norcross Ontario Ltd., Toronto, \$278,024; Canadian Comstock Co. Ltd., Toronto, \$229,748; Pool Construction Co. Ltd., Regina, Sask., \$807,316; Buchan Construction Co., Calgary, Alta., \$200,635; Northern Construction Co., and J. W. Stewart Ltd., Vancouver, B. C., \$183,000; Laviolette Construction Co., Three Rivers, Que., \$90,000; Acme Construction Co., St. John, N. B., \$493,000; Collet Freres Ltd., Montreal, \$87,000; Disher Steel Construction Co., Toronto, \$125,000; Acadia Construction Co., Ltd., Halifax, N. S., \$110,000.

■ Orders for electrical goods booked during third quarter totaled \$411,595,431, compared with \$268,120,065 in second quarter. In third quarter last year they were \$212,001,139, according to the bureau of the census.

Looking Ahead to 1944

■ THE industrial worker, of course, knew far in advance of the 1940 elections that his employer would vote for Willkie. Why, then, was it that so many industrial workers consciously and deliberately voted the other way?

An analysis of the election reveals that the Willkie crusade won good support from the farmer and from the worker in the typical small industrial communities throughout the country. That is, from workers who are members of comparatively small manufacturing organizations, who are close to their bosses, who are interested in their small communities and who to a large extent own their own homes.

In the pivotal states he had a majority until he came to the great industrial centers. In these centers, where many payrolls include thousands of names, where most news about labor disturbances periodically emanates, where the union organizers find their greatest opportunities, the majority of workers looked to Mr. Roosevelt as their good friend, the champion of the common man. They did not so look to their employers.

"Sure the boss is going to vote for Willkie," remarked one worker during the campaign. "If I were in his place I would too. But I work with my hands—Roosevelt is my man."

STEEL believes that all employers should feel very much concerned over this situ-

ation, but it also believes that they need not necessarily feel discouraged. The sharp increase in the Republican vote of 1940 as compared with that of 1936 in itself is proof that a great many more people today have a sounder view toward our economic problems than they had four years ago.

While it has been a difficult job for manufacturers to create and foster the right kind of public and industrial relations, they have made great progress in this direction and there can be no doubt but that the better understanding which now exists between employers and employes at a great many plants was a big factor in encouraging a greater amount of sound thinking in 1940.

The important thing for employers to remember at this time is that their efforts to develop an appreciation of the mutuality of interest between employers and employes have not failed. They have succeeded. The only lack is that they did not succeed on a big enough scale.

Had one out of every 11 of all the voters marked his ballot differently the 1940 result would have been reversed. Just a little difference would have spelled victory instead of defeat. This fact should be remembered in looking ahead to 1944.

EC Kreutzberg

The BUSINESS TREND



Upturn in Industrial Activity Broadening

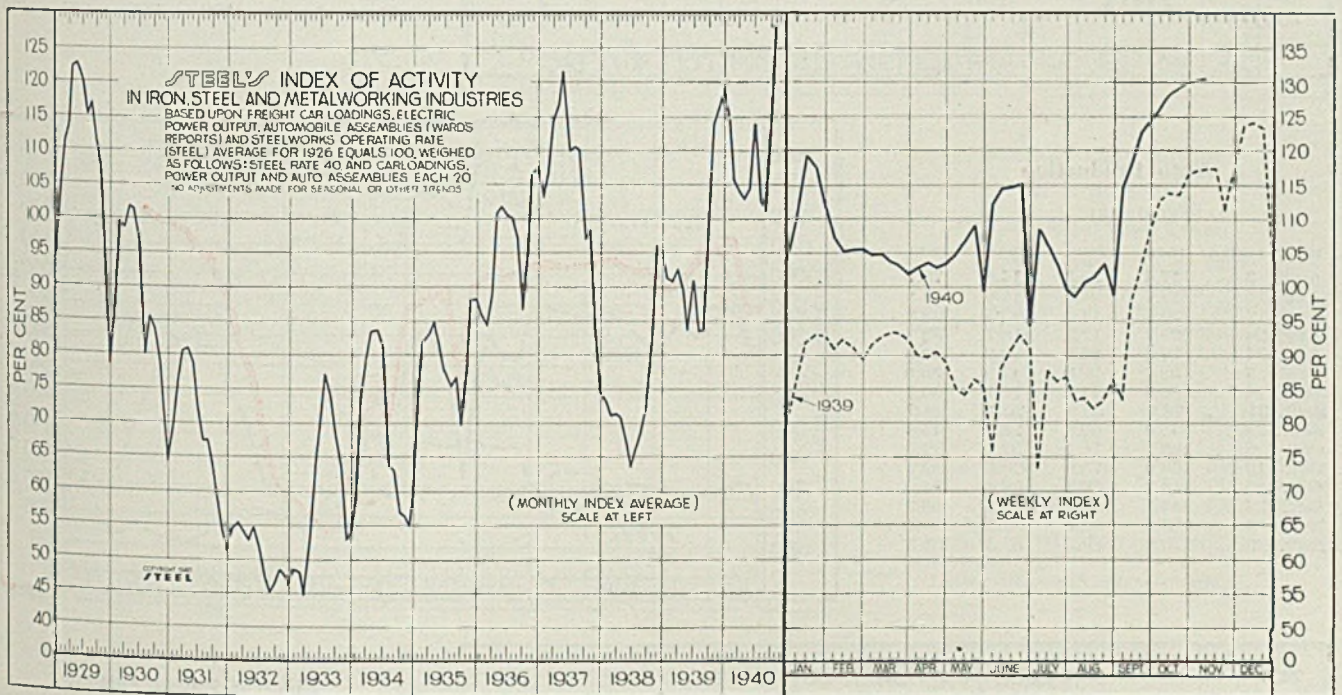
■ CONSUMER goods industries are now participating to a greater degree in the general upswing of industrial activity. The sharp increase in production recorded among the heavy industries since early summer, with the resulting gain in employment and greater purchasing power, is reflected in the more pronounced upturn in operations of many consumer lines. New records recently established in retail automobile sales illustrates this trend.

During the week ended Nov. 9, STEEL'S index of activity edged upward to a new all-time peak of 130.3.

A year ago the index stood at 117.2. The index average for October climbed to 127.8, compared with 113.5 the previous month and 114.9 in the corresponding 1939 period.

The national steel rate remained at 96.5 per cent during the week ended Nov. 9. Automobile output advanced further while electric power output and revenue freight traffic declined slightly.

Extent of the upturn in industrial output in recent months is indicated by the record October steel ingot and pig iron output.



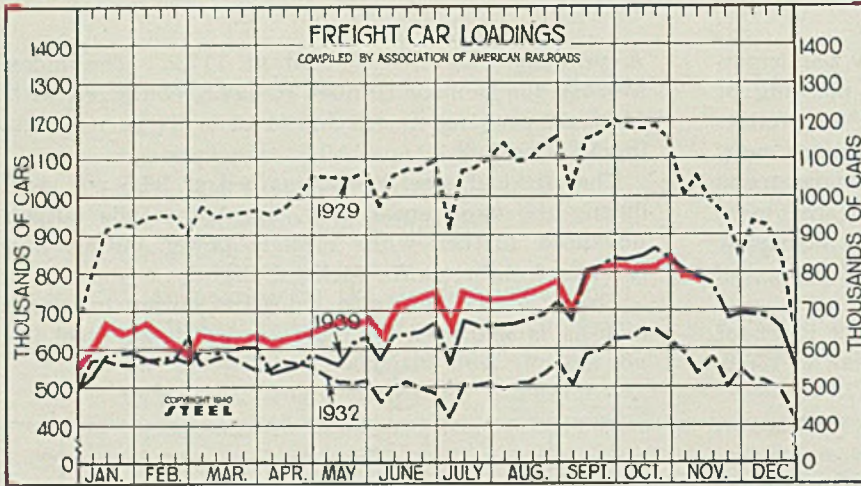
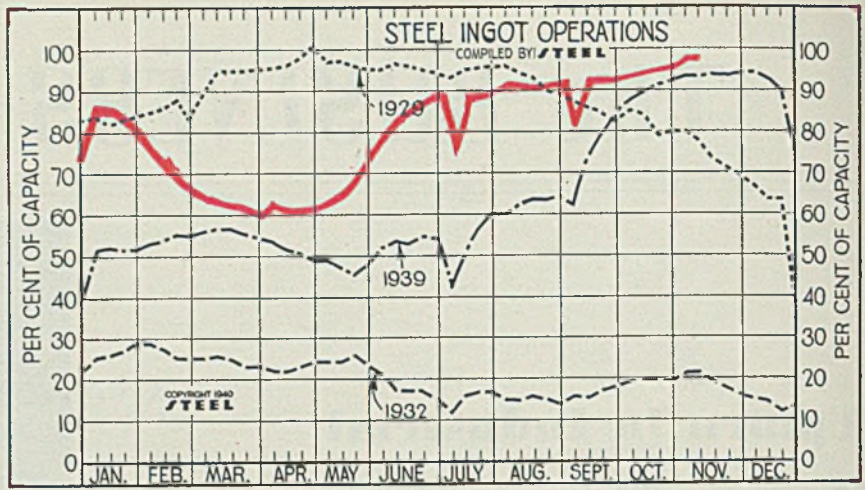
STEEL'S index of activity gained 0.1 point to 130.3 in the week ended Nov. 9:

| Week Ended | 1940 | 1939 | Mo. Data | 1940 | 1939 | 1938 | 1937 | 1936 | 1935 | 1934 | 1933 | 1932 | 1931 | 1930 | 1929 |
|------------|-------|-------|----------|-------|-------|------|-------|-------|------|------|------|------|------|-------|-------|
| Aug. 31 | 103.5 | 86.3 | 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 |
| Sept. 7 | 98.7 | 83.7 | 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 |
| Sept. 14 | 114.9 | 97.5 | 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 |
| Sept. 21 | 117.7 | 103.0 | 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 |
| Sept. 28 | 122.8 | 107.9 | May | 104.6 | 83.4 | 67.4 | 121.7 | 101.8 | 81.8 | 83.7 | 63.5 | 54.8 | 78.6 | 101.2 | 122.9 |
| Oct. 5 | 124.4 | 112.5 | June | 114.1 | 90.9 | 63.4 | 109.9 | 100.3 | 77.4 | 80.6 | 70.3 | 51.4 | 72.1 | 95.8 | 120.3 |
| Oct. 12 | 126.0 | 113.9 | July | 102.4 | 83.5 | 66.2 | 110.4 | 100.1 | 75.3 | 63.7 | 77.1 | 47.1 | 67.3 | 79.9 | 115.2 |
| Oct. 19 | 128.3 | 113.6 | Aug. | 101.1 | 83.9 | 68.7 | 110.0 | 97.1 | 76.7 | 63.0 | 74.1 | 45.0 | 67.4 | 85.4 | 116.9 |
| Oct. 26 | 129.9 | 116.2 | Sept. | 113.5 | 98.0 | 72.5 | 96.3 | 86.7 | 69.7 | 56.9 | 68.0 | 46.5 | 64.3 | 83.7 | 110.8 |
| Nov. 2 | 130.2 | 117.1 | Oct. | 127.8 | 114.9 | 83.6 | 98.2 | 94.8 | 77.0 | 56.4 | 63.1 | 48.4 | 59.2 | 78.8 | 107.1 |
| Nov. 9 | 130.3 | 117.2 | Nov. | ..... | 116.2 | 95.9 | 84.2 | 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 |
|------------|------|------|------|------|
| Aug. 3 | 90.5 | 60.0 | 40.0 | 84.5 |
| Aug. 10 | 90.5 | 62.0 | 40.0 | 84.0 |
| Aug. 17 | 90.0 | 63.5 | 41.5 | 81.0 |
| Aug. 24 | 90.5 | 63.5 | 43.5 | 83.0 |
| Aug. 31 | 91.5 | 64.0 | 44.5 | 83.0 |
| Sept. 7 | 82.0 | 62.0 | 41.5 | 72.0 |
| Sept. 14 | 93.0 | 74.0 | 46.0 | 80.0 |
| Sept. 21 | 93.0 | 79.5 | 48.0 | 76.0 |
| Sept. 28 | 93.0 | 84.0 | 47.0 | 74.0 |
| Oct. 5 | 93.5 | 87.5 | 48.5 | 66.0 |
| Oct. 12 | 94.5 | 89.5 | 51.5 | 63.0 |
| Oct. 19 | 95.0 | 91.0 | 51.5 | 53.0 |
| Oct. 26 | 95.5 | 92.0 | 54.5 | 51.0 |
| Nov. 2 | 96.5 | 93.0 | 57.5 | 47.0 |
| Nov. 9 | 96.5 | 93.0 | 61.5 | 39.0 |



Freight Car Loadings

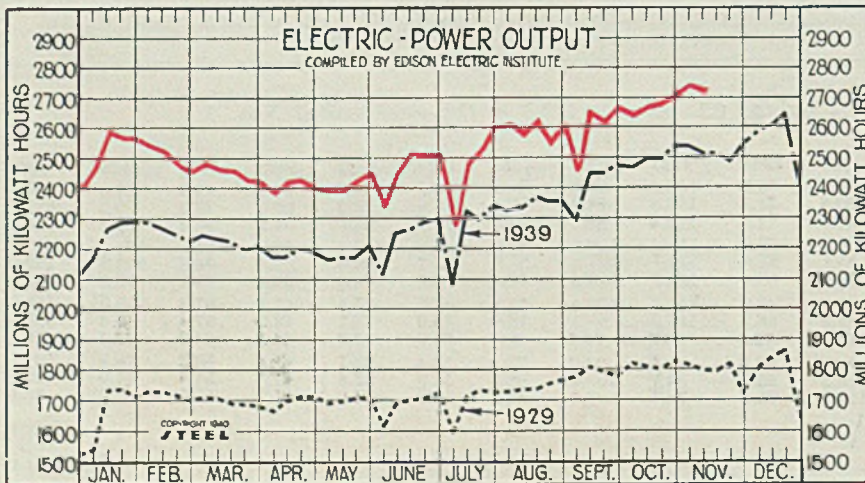
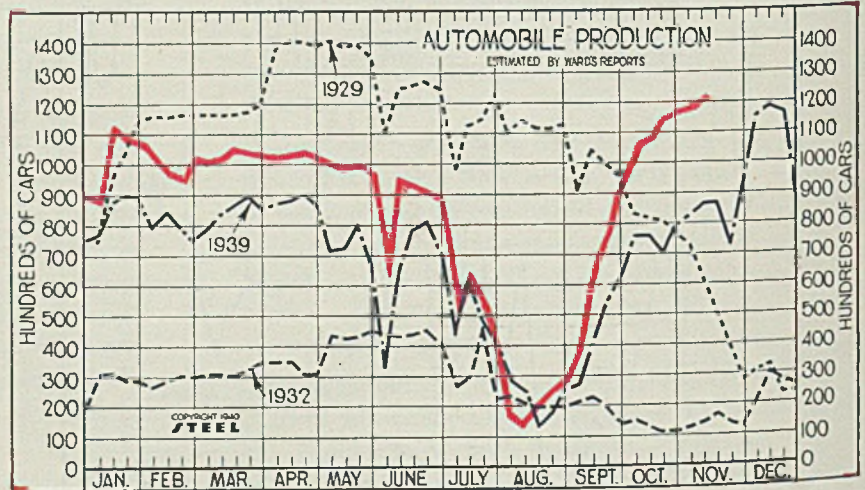
(1000 Cars)

| Week ended | 1940 | 1939 | 1938 | 1937 |
|------------|------|------|------|------|
| Aug. 3 | 718 | 661 | 584 | 770 |
| Aug. 10 | 727 | 665 | 590 | 777 |
| Aug. 17 | 743 | 674 | 598 | 781 |
| Aug. 24 | 761 | 688 | 621 | 787 |
| Aug. 31 | 769 | 722 | 648 | 805 |
| Sept. 7 | 695 | 667 | 569 | 711 |
| Sept. 14 | 804 | 806 | 660 | 827 |
| Sept. 21 | 813 | 815 | 676 | 840 |
| Sept. 28 | 822 | 835 | 698 | 847 |
| Oct. 5 | 806 | 835 | 703 | 815 |
| Oct. 12 | 812 | 845 | 727 | 810 |
| Oct. 19 | 814 | 861 | 706 | 773 |
| Oct. 26 | 838 | 834 | 709 | 772 |
| Nov. 2 | 795 | 806 | 673 | 732 |
| Nov. 9 | 778 | 786 | 637 | 690 |

Auto Production

(1000 Units)

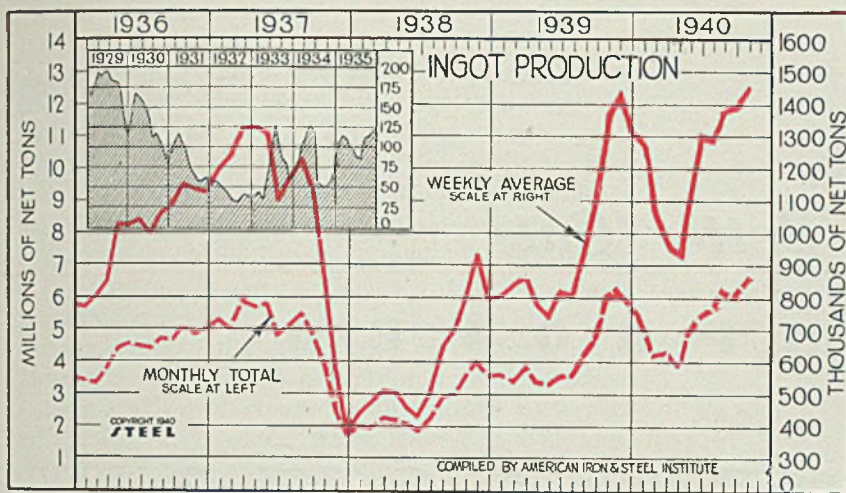
| Week ended | 1940 | 1939 | 1938 | 1937 |
|------------|-------|------|------|-------|
| Aug. 3 | 17.4 | 28.3 | 14.8 | 78.7 |
| Aug. 10 | 12.6 | 24.9 | 13.8 | 103.3 |
| Aug. 17 | 20.5 | 13.0 | 23.9 | 93.3 |
| Aug. 24 | 23.7 | 17.5 | 18.7 | 83.3 |
| Aug. 31 | 27.6 | 25.2 | 22.2 | 64.2 |
| Sept. 7 | 39.7 | 26.9 | 17.5 | 59.0 |
| Sept. 14 | 66.6 | 41.2 | 16.1 | 30.1 |
| Sept. 21 | 78.8 | 53.9 | 20.4 | 28.0 |
| Sept. 28 | 95.9 | 62.8 | 25.4 | 45.8 |
| Oct. 5 | 105.2 | 76.1 | 37.7 | 72.0 |
| Oct. 12 | 108.0 | 75.9 | 50.5 | 89.7 |
| Oct. 19 | 114.7 | 70.1 | 68.4 | 91.9 |
| Oct. 26 | 117.1 | 78.2 | 73.3 | 90.2 |
| Nov. 2 | 118.1 | 82.7 | 80.0 | 89.8 |
| Nov. 9 | 120.9 | 86.2 | 86.3 | 85.3 |



Electric Power Output

(Million KWH)

| Week ended | 1940 | 1939 | 1938 | 1937 |
|------------|-------|-------|-------|-------|
| Aug. 3 | 2,605 | 2,325 | 2,116 | 2,262 |
| Aug. 10 | 2,589 | 2,333 | 2,134 | 2,301 |
| Aug. 17 | 2,606 | 2,368 | 2,139 | 2,304 |
| Aug. 24 | 2,571 | 2,354 | 2,134 | 2,295 |
| Aug. 31 | 2,601 | 2,357 | 2,149 | 2,321 |
| Sept. 7 | 2,463 | 2,290 | 2,048 | 2,154 |
| Sept. 14 | 2,639 | 2,444 | 2,215 | 2,281 |
| Sept. 21 | 2,629 | 2,449 | 2,154 | 2,286 |
| Sept. 28 | 2,670 | 2,470 | 2,139 | 2,275 |
| Oct. 5 | 2,641 | 2,465 | 2,154 | 2,280 |
| Oct. 12 | 2,665 | 2,495 | 2,183 | 2,276 |
| Oct. 19 | 2,687 | 2,494 | 2,214 | 2,282 |
| Oct. 26 | 2,711 | 2,539 | 2,226 | 2,255 |
| Nov. 2 | 2,734 | 2,537 | 2,207 | 2,202 |
| Nov. 9 | 2,720 | 2,514 | 2,209 | 2,176 |



Steel Ingot Production

(Unit 100 Net Tons)

| | Monthly Total 1940 | 1939 | Weekly Average 1940 | 1939 |
|-------|--------------------|---------|---------------------|---------|
| Jan. | 5,655.3 | 3,578.9 | 1,276.6 | 807.9 |
| Feb. | 4,409.0 | 3,368.9 | 1,065.0 | 842.2 |
| Mar. | 4,264.8 | 3,839.1 | 962.7 | 866.6 |
| Apr. | 3,974.7 | 3,352.8 | 926.5 | 781.5 |
| May | 4,841.4 | 3,295.2 | 1,092.9 | 743.8 |
| June | 5,532.9 | 3,523.9 | 1,289.7 | 821.4 |
| July | 5,595.1 | 3,564.8 | 1,265.9 | 806.5 |
| Aug. | 6,033.0 | 4,242.0 | 1,361.9 | 957.6 |
| Sept. | 5,895.2 | 4,769.5 | 1,377.4 | 1,114.4 |
| Oct. | 6,461.9 | 6,080.2 | 1,458.7 | 1,372.5 |
| Nov. | ..... | 6,147.8 | ..... | 1,433.0 |
| Dec. | ..... | 5,822.0 | ..... | 1,317.2 |

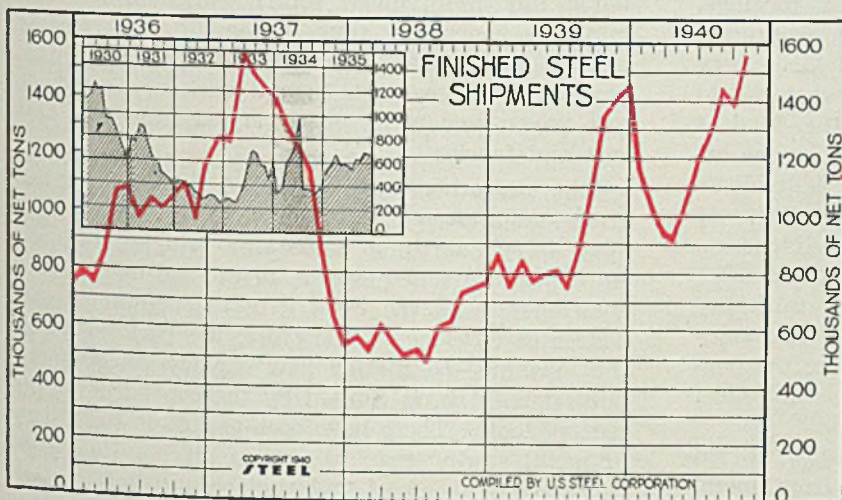
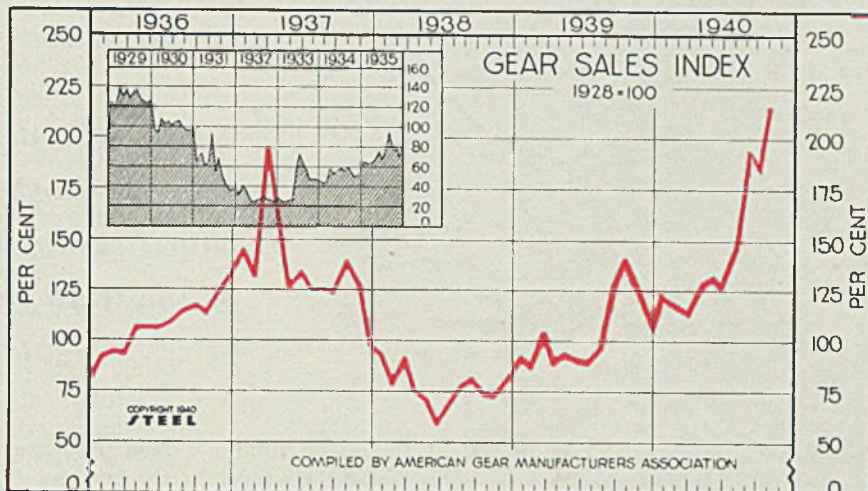
Total 51,585.0 989.4†

†Weekly average.

Gear Sales Index

(1928 = 100)

| | 1940 | 1939 | 1938 | 1937 | 1936 |
|-------|-------|-------|------|-------|-------|
| Jan. | 123 | 91.0 | 93.0 | 144.0 | 90.5 |
| Feb. | 116 | 86.0 | 77.0 | 130.5 | 93.0 |
| Mar. | 114 | 104.0 | 91.0 | 195.0 | 92.0 |
| April | 128 | 88.0 | 74.0 | 164.0 | 105.0 |
| May | 133 | 93.0 | 70.0 | 125.5 | 105.0 |
| June | 129 | 90.0 | 58.0 | 134.0 | 105.0 |
| July | 141 | 89.0 | 67.0 | 124.0 | 107.5 |
| Aug. | 191 | 96.0 | 76.5 | 125.0 | 113.0 |
| Sept. | 183 | 126.0 | 80.5 | 123.0 | 115.5 |
| Oct. | 216 | 141.0 | 72.5 | 139.5 | 112.5 |
| Nov. | ..... | 126.0 | 72.0 | 127.5 | 122.5 |
| Dec. | ..... | 111.0 | 81.0 | 97.0 | 132.5 |
| Ave. | ..... | 103.5 | 76.0 | 135.5 | 107.5 |



Finished Steel Shipments

U. S. Steel Corp.

(Unit 1000 Net Tons)

| | 1940 | 1939 | 1938 | 1937 | 1936 |
|-------|--------|--------|-------|--------|--------|
| Jan. | 1145.6 | 870.9 | 570.3 | 1268.4 | 795.2 |
| Feb. | 1009.3 | 747.4 | 522.4 | 1252.8 | 747.4 |
| Mar. | 931.9 | 845.1 | 627.0 | 1563.1 | 863.9 |
| Apr. | 907.9 | 771.8 | 550.5 | 1485.2 | 1080.7 |
| May | 1084.1 | 795.7 | 509.8 | 1443.5 | 1087.4 |
| June | 1209.7 | 807.6 | 525.0 | 1405.1 | 978.0 |
| July | 1296.9 | 745.4 | 484.6 | 1315.3 | 1050.1 |
| Aug. | 1455.6 | 885.6 | 615.5 | 1225.9 | 1019.9 |
| Sept. | 1392.8 | 1086.7 | 635.6 | 1161.1 | 1060.7 |
| Oct. | 1572.4 | 1345.9 | 730.3 | 876.0 | 1109.0 |
| Nov. | ..... | 1406.2 | 749.3 | 648.7 | 947.3 |
| Dec. | ..... | 1444.0 | 765.9 | 539.5 | 1178.6 |

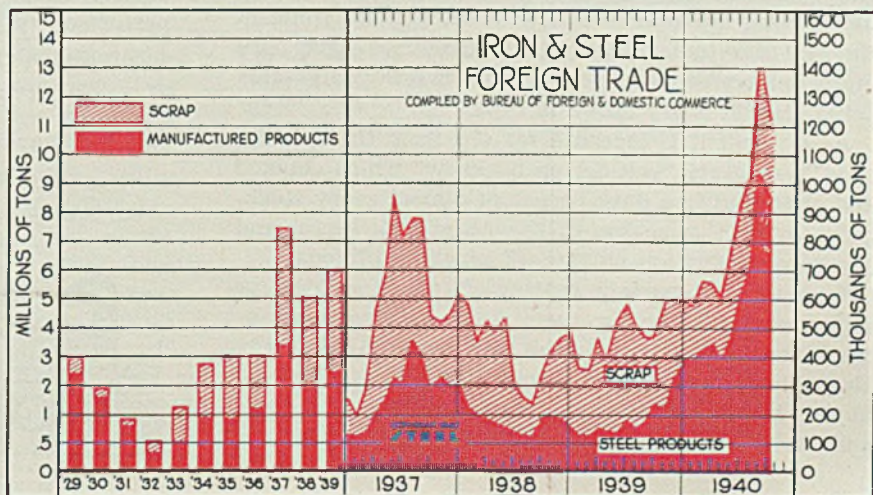
Total..... 11707.3 7315.5 14097.7 11905.0

†After year-end adjustments.

Iron and Steel Exports

(Thousands of Gross Tons)

| | Steel Products | | Scrap | | Total |
|-------|----------------|---------|-------|---------|--------|
| | 1940 | 1939 | 1940 | 1939 | |
| Jan. | 396.1 | 134.8 | 187.5 | 227.9 | 583.5 |
| Feb. | 436.6 | 134.8 | 234.7 | 224.9 | 671.3 |
| Mar. | 457.1 | 162.1 | 206.9 | 312.3 | 664.0 |
| April | 391.8 | 153.9 | 221.2 | 240.1 | 612.9 |
| May | 471.5 | 147.8 | 312.5 | 384.9 | 784.0 |
| June | 617.7 | 190.0 | 318.4 | 398.9 | 936.0 |
| July | 707.8 | 163.6 | 327.1 | 350.1 | 1034.9 |
| Aug. | 1046.1 | 185.2 | 346.1 | 291.9 | 1402.1 |
| Sept. | 965.4 | 244.9 | 251.1 | 330.7 | 1221.1 |
| Oct. | ..... | 255.1 | ..... | 336.8 | ..... |
| Nov. | ..... | 332.9 | ..... | 272.7 | ..... |
| Dec. | ..... | 394.0 | ..... | 206.4 | ..... |
| Total | ..... | 2,499.0 | ..... | 3,577.4 | ..... |



By K. W. ATKINS
Vice President
E. C. Atkins & Co.
Indianapolis

Better Bites . . . Better Cuts

W I T H I M P R O V E D

UTTING-OFF SAWS

New tooth design for metal-cutting saws employs special curved gullet which coils chips, eliminating entirely the choking up of the teeth that heretofore severely limited blade performance

■ AMONG THE most useful, but at the same time least appreciated of machine tools, are metal-sawing machines used for cutting off bars, billets, forgings, etc. Regardless of type—which may be reciprocating, band, or circular—these sawing machines very commonly are placed in locations which soon would “break down the health” of almost any other kind of machine tool. What little operating and service attention they receive is apt to be from individuals who, to say the least, are not keenly appreciative of fine points of machine tool design and maintenance.

Nevertheless, these machines go on week after week and month after month performing faithfully and well their unspectacular but highly necessary service in all kinds of plants—ranging from the one-man basement job shop to the latest glass and steel aircraft engine plant employing thousands.

Having tried, in the foregoing paragraphs, to rip aside an undeserved veil of obscurity from metal sawing machines, we now want to go a step further by pointing out that in line with the general trend in the machine tool industry these machines have been improved tremendously in the past few years—this being true of every size and type.

As a result it is indeed a far cry from the spindly, slow, inaccurate “belt-driven hacksaw” which clanked and chattered in a dark corner of almost every stock-room in days gone by, to the rugged, powerful and accurate production cutting-off machine of today.

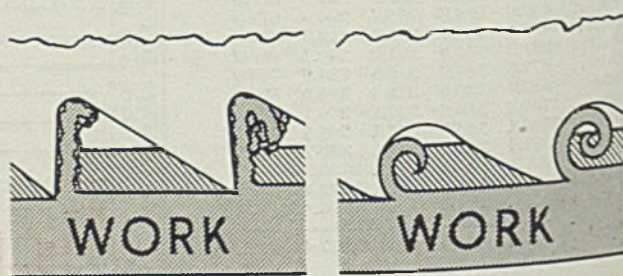
Designers of modern cutting-off machines deserve high commendation for their recent achievements as machine tool engineers in the best sense of that term. Up-to-the-minute features embodied in their current models include: Electrification; hydraulic cutting feed and work clamping; automatically varying cutting

feed pressure to suit conditions at different stages of the cut (as, for example, when going through a round bar); improved “quick return” mechanisms which minimize noncutting time; automatic stock feeding, gaging to length and clamping which speed up mass production of gear blanks and various other duplicate parts; and rigid, neatly styled frames — both cast and fabricated.

Like any other machine tool, a metal sawing machine—regardless of size or type—is, in the final analysis, primarily a device for bringing tool and work into controlled contact to the end that the tool shall operate on the work with the highest possible degree of efficiency. Therefore, the performance of the machine—no matter how capably designed and built it may be, is limited by the capabilities of its cutting tools. There have been periods in the history of metal sawing machines when machine tool engineering got ahead of tool engineering, thus causing the saw blade to be the limiting factor in production performance.

Situations of that kind never exist very long in

Fig. 1—Diagram shows how curling action prevents metal from jamming in teeth



STEEL

the American metalworking field. Recognizing their responsibilities, saw blade manufacturers began to work hand in hand with metal sawing machine manufacturers. As a result, a number of newly designed machines actually have been developed to make it possible to take full advantage of recent notable improvements in straight, band and circular saw blades.

The situation is comparable to that of a number of years ago, when production milling machines temporarily outgrew the capabilities of milling cutters. Thereupon, tool engineers appeared on the scenes with new types of coarse tooth milling cutters of high speed steel, which made necessary still more rugged and more powerful milling machines. One development without the other would have been of no practical utility—any more than would a high power rifle without high power propellant, or vice versa.

An interesting case in as far as the metal sawing machines are concerned is the curled chip system of metal cutting introduced recently by E. C. Atkins & Co. in connection with blades of a wide variety of shapes and sizes—including power hack saw blades, circular milling saws, circular segmental inserted tooth cold saws, and metalcutting bands.

While high speed steel has for 15 or 20 years been recognized as a desirable material for metal-cutting saw blades, the performance of these high speed steel blades has often been limited by the failure of the blades to clear themselves of chips properly. Therefore, tool engineers of the Atkins company tackled the blade problem from the standpoint not only of improving the ability of each individual tooth in a blade to cut efficiently but also to clear itself of chips completely following each pass through the work.

The result of their investigations in the basic theory of metal cutting, and of their practical experiments with all types of blades on materials ranging from copper to the latest tough alloy steels, is a wholly new form of tooth. This new tooth is of pronounced hook shape as compared to the old familiar angular shape. It is shown diagrammatically in Fig. 1, which depicts a section of a circular saw in the process of cutting. Each tooth culminates in a hard, keen cutting edge which bites into metal in much the same manner that a properly designed "parting tool" does in a lathe.

As each tooth of the saw comes into contact with the work, it immediately starts to peel up a chip. Then, as the tooth progresses, this chip is lifted by the wedging action of the tooth. Following the contour of the specially curved gullet of the new style tooth, the chip is curled naturally into a tight coil under tension like a wound-up clock spring. The instant the tooth emerges from the kerf, this tightly wound chip is free to uncoil—which it does suddenly thus kicking itself out of the gullet and clearing the tooth completely for its succeeding cut. This does away entirely with the choking up of the teeth which results in the difficulties known as "gilding" and "sled-runner effect."

Fig. 2, which is a closeup of an actual cut being taken by a heavy duty circular saw on a large diame-

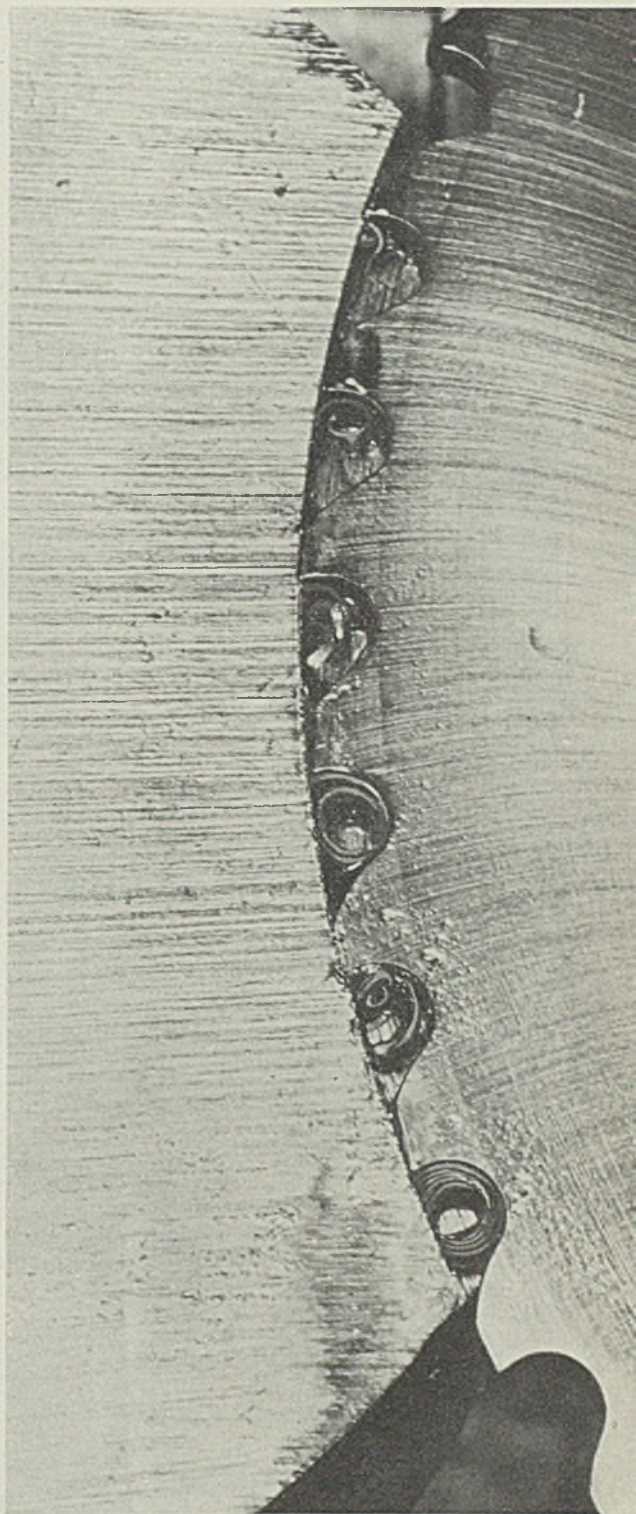


Fig. 2.—Top to bottom clearly shows progressive development of curled chips from first cut in top tooth gullet to full grown chip in bottom. Note, too, that no chips are lodged in gullets of unoccupied or nonengaged teeth

ter steel bar, shows six of the new chip curling teeth in various stages of cutting. The upper tooth is just starting to pick up a chip from the solid metal; the next four teeth demonstrate the progressive formation of the coil in the gullet; while the tightly coiled chip in front of the sixth (lower) tooth is shown as it is at the instant before the tooth emerges and the chip springs out of the gullet.

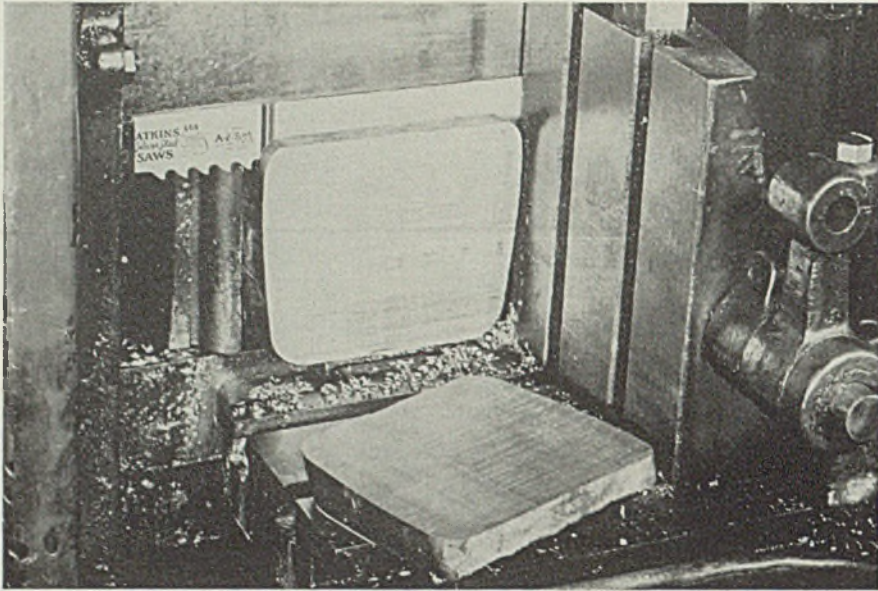
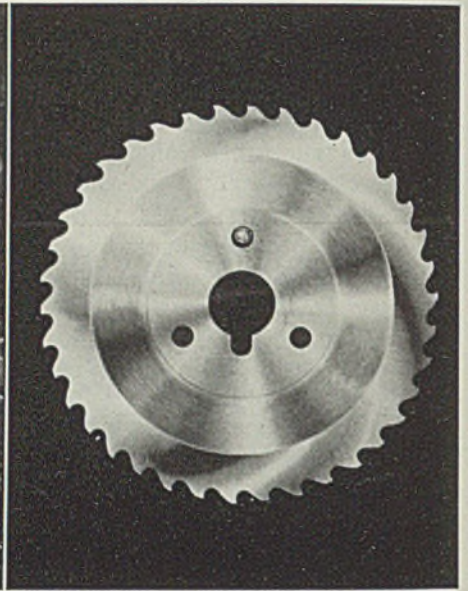


Fig. 3. (Left)—Notice the curled chips on vise bed in cutting these 7 x 7-inch billets. Fig. 4. (Right)—Solid-tooth milling saw with radial clearance ground by patented cup wheel method



This clearing action is further demonstrated in Fig. 3, which shows a 7 x 7-inch billet being cut by one of the new type straight blades in a Peerless reciprocating-type machine. The curled chips, as they appear after having ejected themselves from the gullets between the teeth, can be seen lying on the bed of the machine in front of the work. This unretouched photograph, Fig. 3, brings out certain other important points in regard to these new chip curling teeth. While they may appear to be surprisingly coarse in pitch if judged by the standard of a conventional blade of this size, it will be noticed that the surfaces left on the work are remarkably smooth, true and free of chatter marks and burrs. This is due to the clean cutting action of the correctly shaped teeth and to the fact that there are no chip-clogged gullets to burn and score the work, draw the temper

of the teeth, and force the blade off its true course. Because these blades do not "wander off the line," even when being fed into the work at two to five times the conventional rate, breakage is greatly reduced. The unique "buttressed design" of these relatively coarse pitch teeth give them unusual strength to stand up to the heavy cuts which they take. It should be mentioned that with these blades, heavy cuts are taken under much less feeding pressure and driving power than might be assumed from the "huskiness" of the chips.

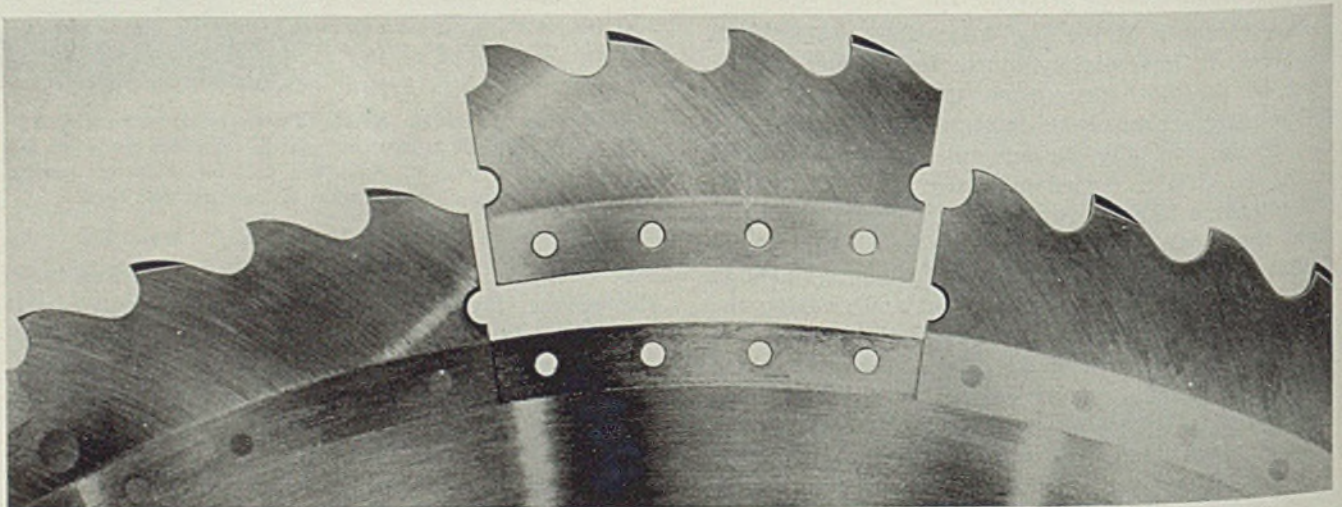
The free cutting action of these chip-curling metal-cutting saws is not altogether due, however, to the unusual profile of their teeth. The method of grinding these teeth also has a lot to do with their per-

formance. As may be apparent from Figs. 2 and 4, the system as far as the saw blades is concerned, involves a unique method of grinding the teeth in groups of two. Because of this grind, no one tooth has to take a cut to the full width of the kerf. The first tooth of a pair—called the "roughing tooth"—is bevel ground to take a deep V-shaped cut. The second—or "finishing tooth"—which is ground square and to full width, then has only to sweep out two narrow chips at the sides to complete the kerf. This system of grinding has much to do with the chatter-free action of these saws.

In the case of the solid tooth milling saws of chip curling type, the teeth are "radial clearance ground." All teeth take a full width cut, but through the use of a patented cup wheel grinding method, the teeth are "dished in" on both sides from the point of the tooth toward the center of the saw. This eliminates side friction and galling even when working in copper. These

Fig. 5—Section of segmental saw showing how replaceable segments are readily inserted

(Please turn to Page 95)



**How to get
MORE PRODUCTION
from present equipment**

There are two ways—faster speeds—or fewer interruptions.

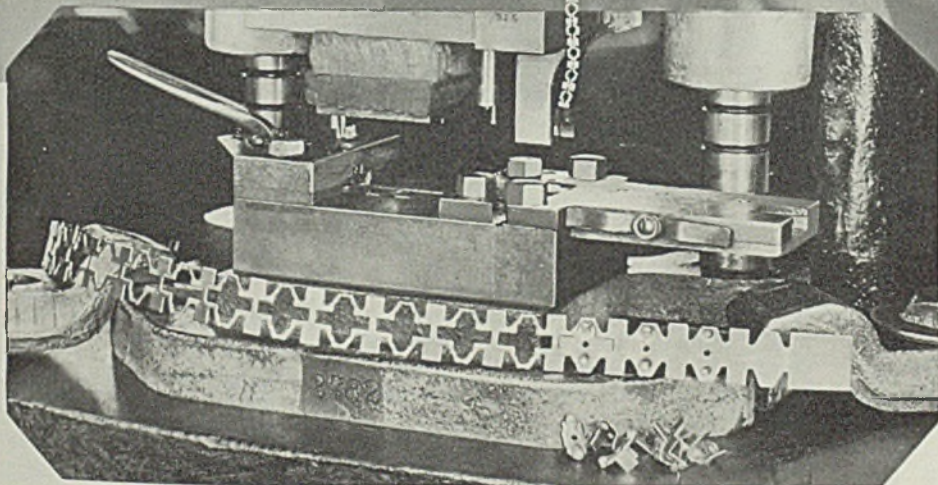
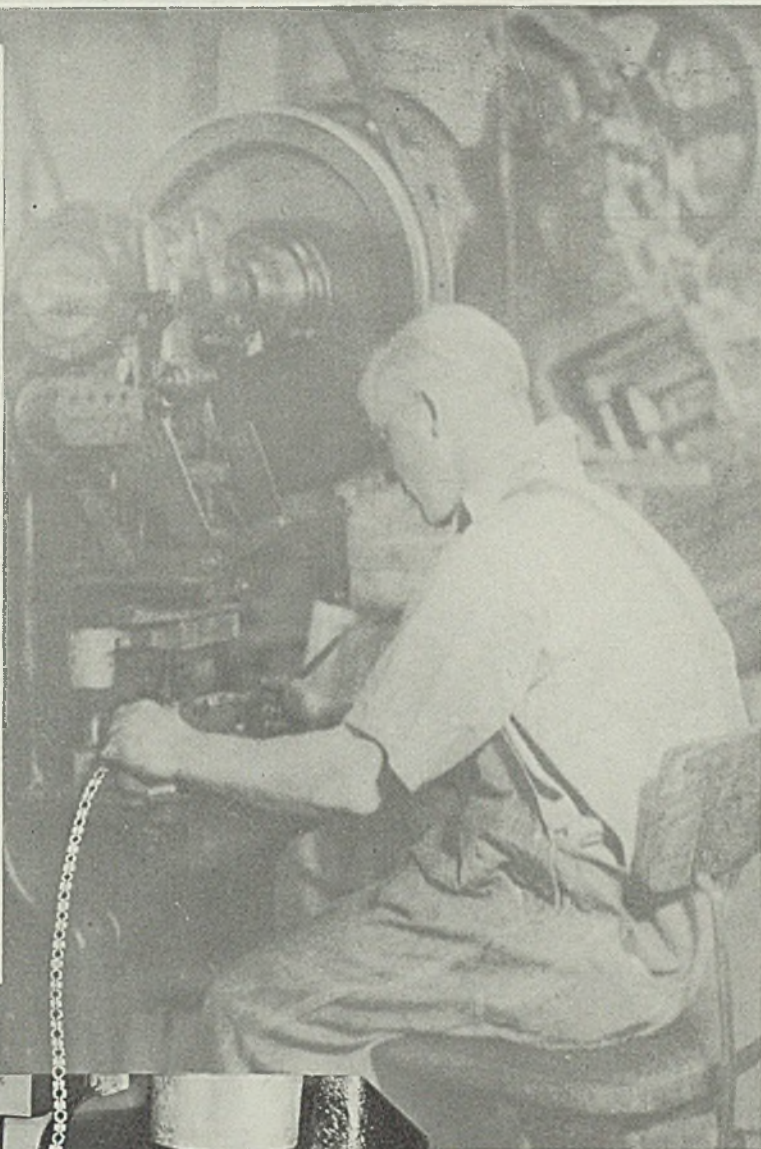
Ten to one, you've checked on the speed question—but what about interruptions? Particularly interruptions caused by poor tool performance?

Every time a machine or press must be shut down to "touch up" the tools, re-grind or replace them, it cuts down your production, upsets schedules and jacks up unit costs.

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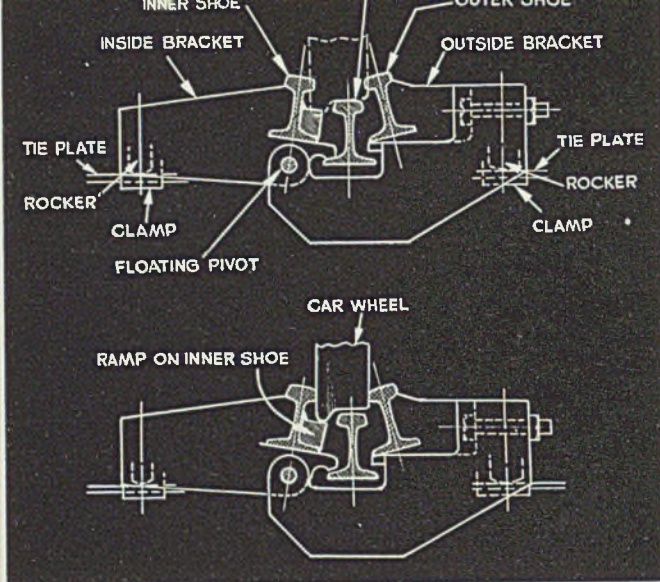


Fig. 1—Schematic operating diagram of inert car retarder. Top, retarder at rest; below, wheel in retarder

Costs Sliced in Half

All-welded inert car retarder of simple construction cuts cost 50 per cent, thus making the unit available for many installations where the higher cost would be prohibitive

■ A CAR retarder is a machine located in the track over which freight cars are moved (generally by gravity), its purpose being to control the speed of the cars, or retard their motion.

Experience has shown that friction applied to the sides of the wheels near the rim gives the most efficient means of retardation. To accomplish this, most practical designs provide members known as shoes and means for bringing these shoes in contact with the sides of the moving wheels with sufficient pressure to produce frictional forces which will act upon the wheels in such manner as to cause the desired retardation. It is desirable, in order to prevent any tendency to bend or twist the wheels, that the pressure produced by the shoes against each side of the wheel should be equal.

There is considerable variation in the thickness of wheels, also the shoes are subject to wear, therefore, provision must be made for controlling and regulating the force applied to the shoes.

A device which utilizes the weight and motion of the car to actuate the retarding mechanism, thus dispensing with the necessity of any outside motive power and at the

same time accurately proportioning the retarding effect to the weight of the car to be controlled, is the design of the inert retarder in Fig. 1. In service, the shoes are adjusted while the retarder is at rest so that the distance between the inner and outer shoe is less than the minimum thickness of a car wheel. When a wheel enters the retarder, the shoes are spread apart by means of tapering ends on the shoe rails. This causes the floating pivot to rise, lifting the inside bracket from its resting position on the flange of the track rail. As the wheel continues to enter the retarder, its flange gradually rides up on the ramp on the inner shoe, thus lifting the wheel off the track rail, transferring its weight from the track to the clamping brackets which pivot on the rockers and clamp the wheel between the two shoe beams.

The compact simplicity of the inert retarder, Fig. 2, was made possible by using stock shapes and arc welding.

To check the theoretical perform-

Data and illustrations from an award study submitted to the James F. Lincoln Arc Welding Foundation by George E. Roberts, designer, General Railway Signal Co., Rochester, N. Y.

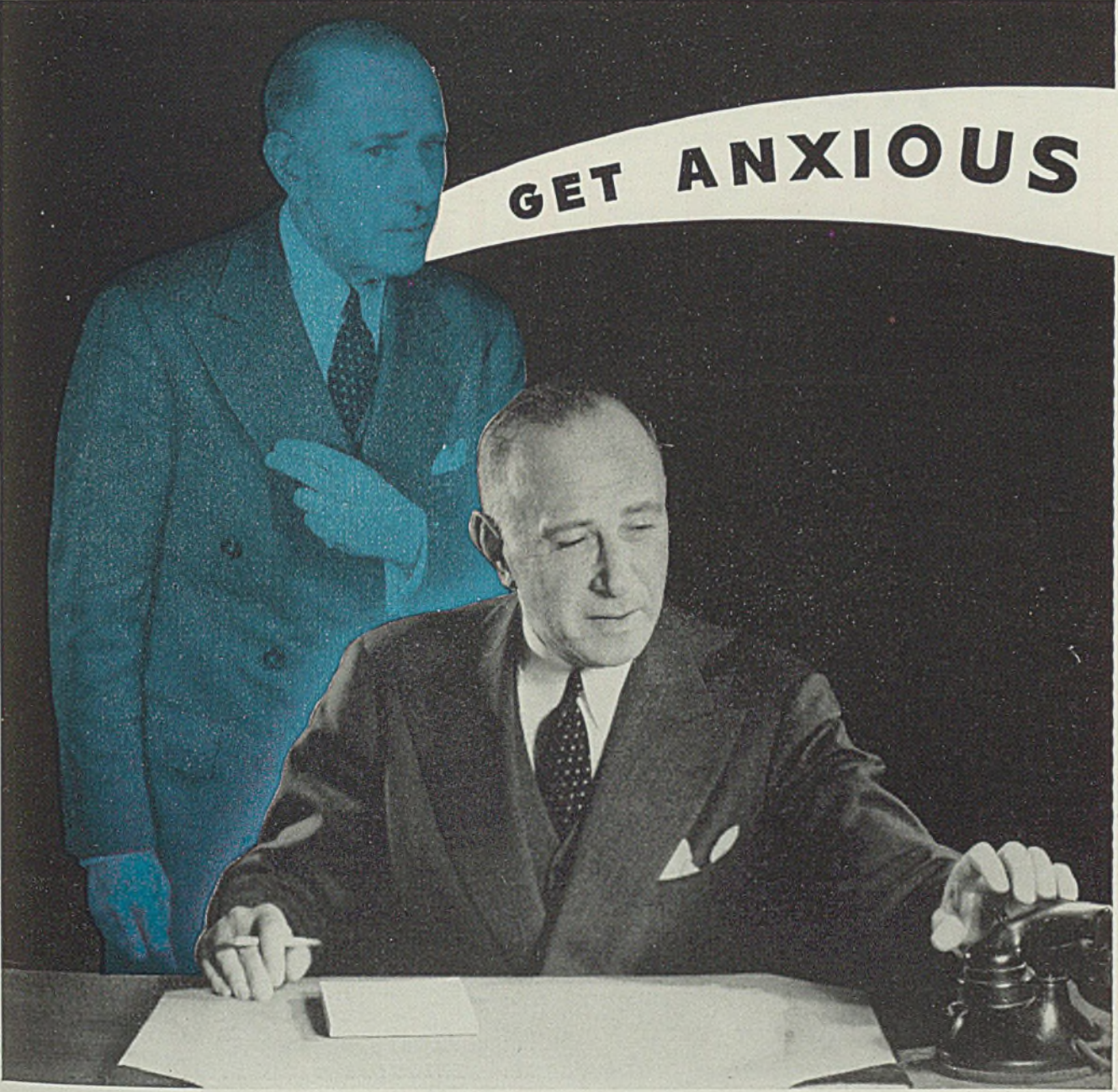
ance of the new device, a small quarter size model was built before any work was actually started on the real job. It consisted of only the first pair of brackets at the entering end of the retarder.

The various members, their location and relation to each other are shown in Fig. 2 and are as follows:

- A—Inside bracket
- B—Outside bracket (adjustable)
- C—Inside shoe beam (with ramp)
- D—Outside shoe beam
- E—Track rail
- F—Inside clamp (with rocker, adjustable)

As these several members are all subassemblies, they will be described and analyzed here separately.

Inside Bracket A: The principal over-all dimensions of this part are shown in Fig. 3. The two outer plates are flame cut from 2-inch thick hot-rolled steel, SAE 1020, net weight approximately 76 pounds each. Connecting plate is the same material 1-inch thick, weighing about 57 pounds. The three pieces were blocked up and tack welded to position them, then braced with screw jacks between the two outer plates and tilted so a flat fillet weld could be applied at the joints. This



GET ANXIOUS

ALTER EGO: Literally "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

ALTER EGO: Can't you make up your end of our mind to settle on Lincoln machines?

Not yet, because I can't be sure that two controls on arc welders are necessary.

ALTER EGO: How can you possibly be sure when you don't understand?

But, I hear that other machines do well with just one control.

ALTER EGO: Listen, when a man no longer is

anxious to do better than WELL—he's done for.

All right. For the sake of argument, call me anxious.

ALTER EGO: OK—now let's put it up to Lincoln.

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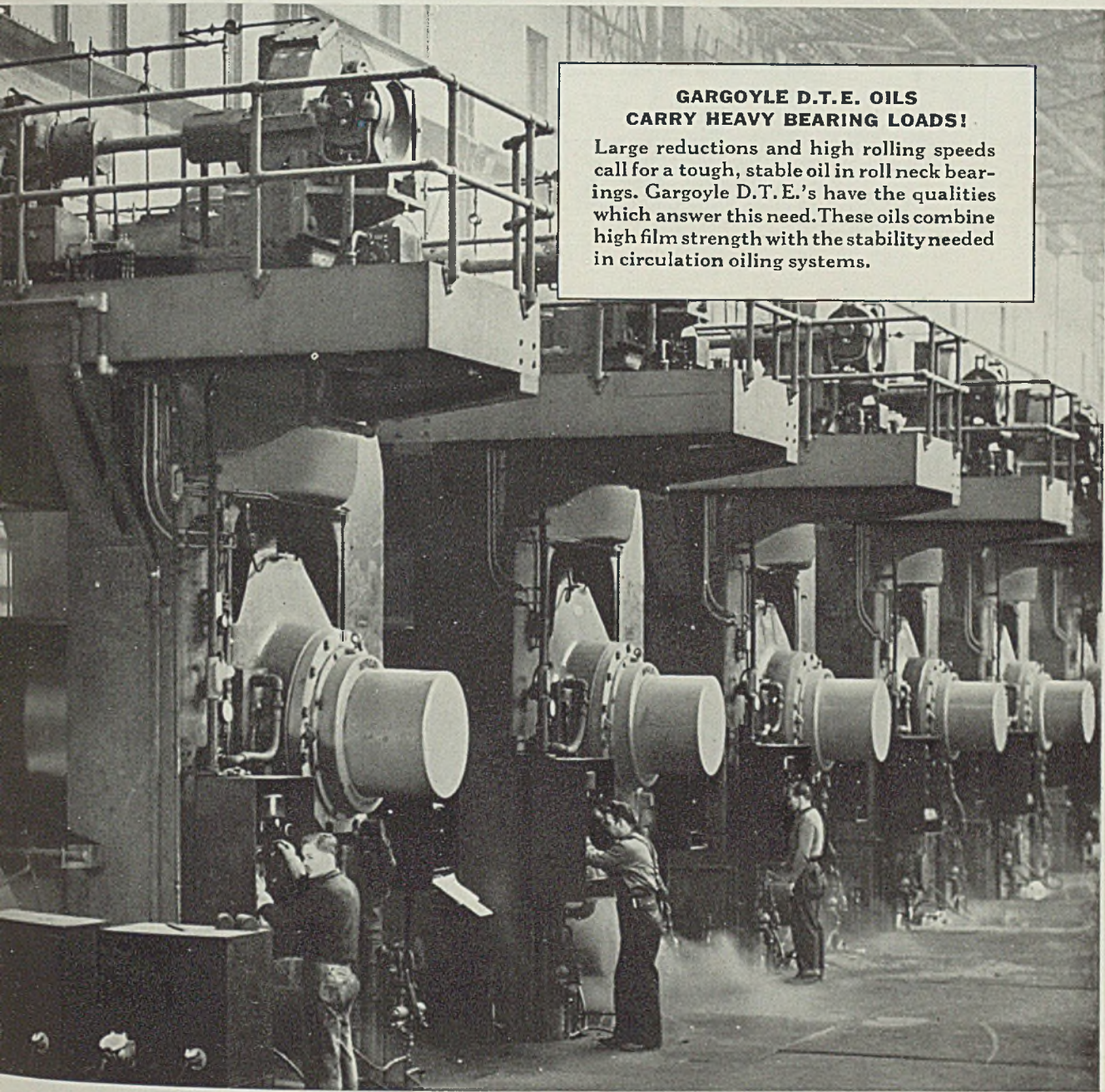
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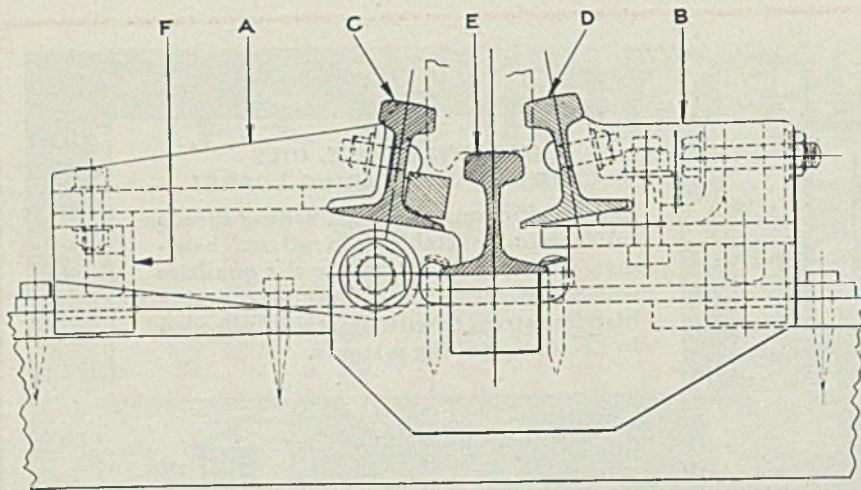
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weld was made by the "step-back" method. To avoid distortion, the steps were taken alternately on both sides of the joints. Electrodes for the first passes were $\frac{1}{4}$ -inch Lincoln Fleetweld 7; the final pass with $\frac{5}{16}$ -inch electrode.

The finished $\frac{3}{8}$ -inch fillet was of satisfactory appearance, perfectly in accord with the rest of the work. As the welds were carefully applied and the work allowed to cool thoroughly before removing the screw jacks, no serious distortion was encountered and no stress relieving was considered necessary.

The long slot in the connecting plate was machined before assembly. The two holes in this piece, as well as the reamed holes in the side plates, were drilled after welding. There are four of these inner brackets used on the retarder.

Overhead Cost Not Included

In considering the following cost analyses, as they are not estimates but actual expenses, it must be remembered that this was experimental work, that no special fixtures or equipment were provided, and that consequently the labor charges are high. The 8 cents per pound charge for steel is based on the net weight of flame-cut parts and includes cutting. No burden or overhead is included in these figures. Table I shows total cost of arc welded bracket A to be \$21.55.

Outside Shoe Beam B: Dimensions are shown in Fig. 4. Four of these parts were used. The same procedure as for bracket A was followed in welding this part. The outside rocker and clamp are, however, integral parts of bracket B. Table I shows total cost of arc welded bracket B to be \$32.84.

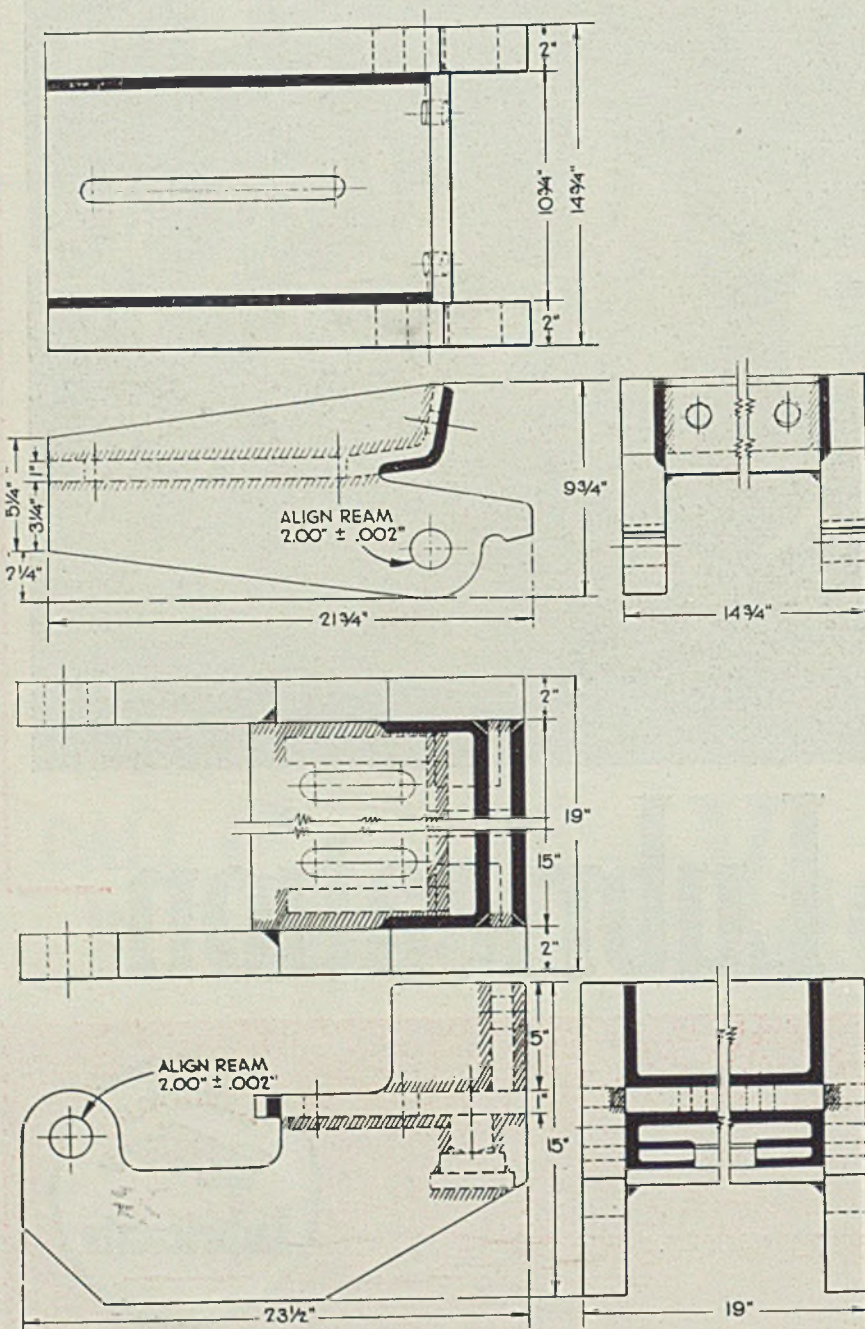
Inside Shoe Beam C (With Ramp) and Outside Shoe Beam: Fig. 5 shows shoe beam C and its construction. The rail used is a standard 105-pound Carnegie section No. 10524 and the reinforcing plates are also standard Carnegie sections No. 10524-A. The ramp is 2-inch cold-rolled steel, SAE 1020. The complete beam weighed about 1200 pounds.

In service, this beam is bolted to the four inside brackets spaced 4 feet $10\frac{1}{2}$ inches apart and the reinforcing plates are arranged to

Fig. 2. (Top)—Location and relation of various members

Fig. 3—Inside bracket A—principal dimensions. Welds are $\frac{3}{8}$ -inch fillets, both sides as shown: involve 5.5 pounds of $\frac{1}{4}$ -inch rod, 8.25 pounds of $\frac{5}{16}$ -inch

Fig. 4—Outside bracket B. Here the $\frac{3}{8}$ -inch fillet welds involved 5.75 pounds of $\frac{1}{4}$ -inch rod, 8.75 pounds of $\frac{5}{16}$ -inch



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- ON THE SHEETS

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 Cust. No. *311*
 Order No. *1421*

Specifications:
 Length *40 in.*
 Width *36 in.*
 No. Shts. *200*
 Sht. Wt. *15 lb.*

| PROCESS | OPERATOR | Weight | Sheets | REJECTED | | DATE |
|-----------------------|-----------|-------------|------------|---------------|----------|------------|
| | | | | Weight | Sheets | |
| <i>Cold Roll</i> | <i>23</i> | <i>3000</i> | <i>200</i> | — | — | <i>9/1</i> |
| <i>Shearing</i> | <i>17</i> | <i>3100</i> | <i>200</i> | — | — | <i>9/5</i> |
| <i>Annealing</i> | <i>6</i> | <i>2955</i> | <i>197</i> | <i>45 lb.</i> | <i>3</i> | <i>9/1</i> |
| <i>Temper Pass</i> | <i>37</i> | <i>2955</i> | <i>197</i> | — | — | <i>9/1</i> |
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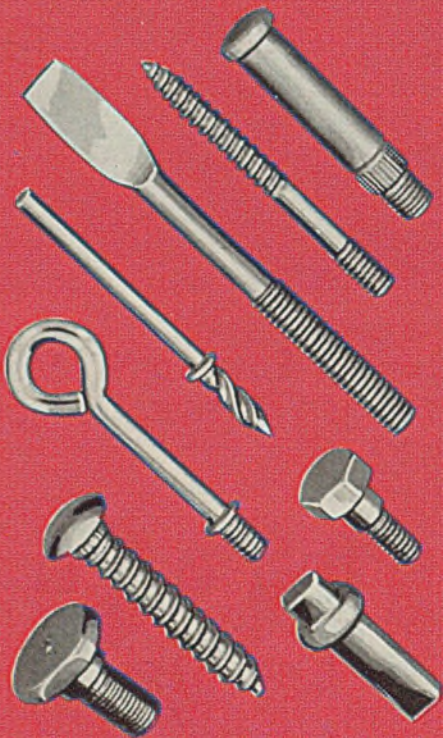
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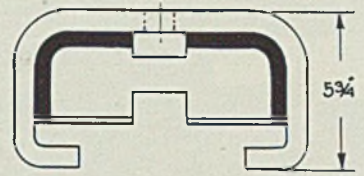
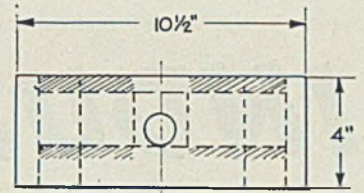
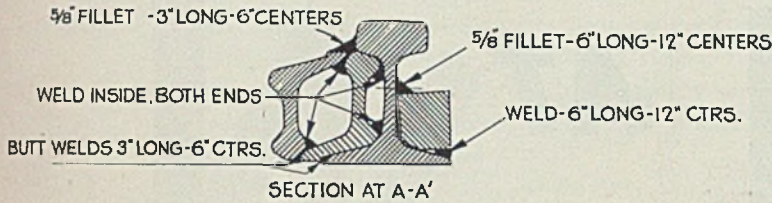
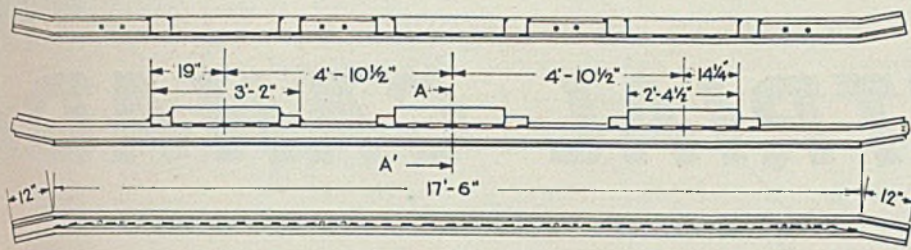


Fig. 5. (Left)—Illustrates the inside shoe beam C

Fig. 6—Inside clamp F. Welds are 1/2-inch fillets

come central between the brackets. As the greatest strain on this member occurs when the wheel in the retarder is midway between the brackets, it may be considered as a simple beam fixed at both ends with a single concentrated load at the center.

The welding of these shoe beams presented some interesting features. The first was welding the ramp to the rail. The ramp was given a slight gradual curvature so when one end was placed against the web of the rail, the opposite end stood about 12 inches away from the adjacent web. Fillet welds then were made and the two pieces pulled together perfectly.

All the welds on this piece were thoroughly peened between passes to relieve welding stresses. As the outside shoe beam D is exactly the same as beam C except for the ramp on the inside beam, the two beams were welded at the same time. They were blocked about 6 inches apart in the center and the ends pulled together and firmly clamped. This left the outside of both pieces slightly convexed and against this outside convexed surface the reinforcing plates were welded using 1/4-inch Lincoln Manganweld electrodes.

Due to the type of service expected from these shoe beams, it is perfectly feasible to use for the rails and splice plates, parts which have served their purpose as track material. Such old rails were used in building the retarder and proved

perfectly satisfactory, an added economy.

By clamping the two beams together as noted above and carefully peening all welds, little warping was in evidence. To relieve any possible internal stresses, the entire beams were placed in a furnace, then slowly and uniformly brought up to 1500 degrees Fahr. and held at that temperature for about 6 hours. They were carefully blocked up to prevent distortion. After cooling in the furnace for about 16 hours, they were taken out and allowed to cool slowly in air.

Assuming a cost of \$0.03 per pound for the steel and combining all labor charges, costs as shown in Table I were \$84.94 for inside beam C and \$69.27 for outside beam D.

Track Rail E: The work on this part consisted only of welding eight pieces each 4 1/2 inches long of 3 x 3/4-inch commercial steel angle to the underside of the flange of a 39-foot length of a standard 105-pound rail. These pieces were so located that they acted as confining stops for the brackets. About 11 pounds of Manganweld electrodes were used for this work.

Inside Clamp F, with Rocker: This piece, shown in Fig. 6, provides the adjustable fulcrum for the inside bracket A, as may be seen by reference to Fig. 2. By sliding

the clamp and rocker toward the shoe beam, the lever arm of bracket A is shortened and the clamping pressure of the inside shoe beam reduced. One-half-inch fillets, made with 1/4-inch Fleetweld 7 electrodes, were used. Total cost of arc welded clamp F was \$2.37.

A steel casting was used to clamp the outside shoe beam to the brackets and provide adjustment. The remaining parts of the device consisted of tie plates and shims with the necessary pins, bolts, nuts, washers, lag screws, spikes, etc.

Table I details cost of the completed retarder as made. The saving of 50 per cent in cost by arc welding over previous constructions makes this inert retarder available for a great many installations where the higher cost of other designs would make their use prohibitive.

Rod Joins Aluminum Alloys Without Flux

By the use of Colaweld T rod, aluminum and its alloys may be joined without flux, according to Colonial Alloys Co., East Somerset, Trenton avenue and Martha street, Philadelphia. It also eliminates the necessity of roughening the metal surfaces. The absence of flux is said to remove the dangers of toxicity and burns to the worker, and progressive corrosion to the metal.

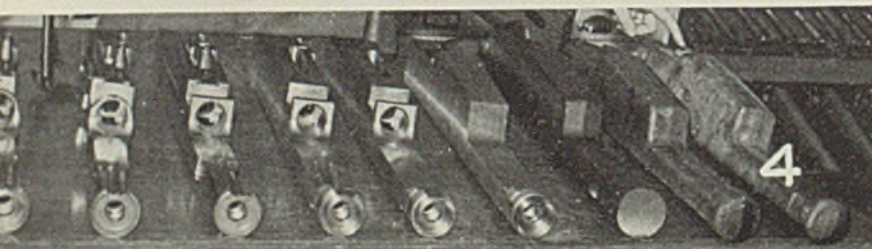
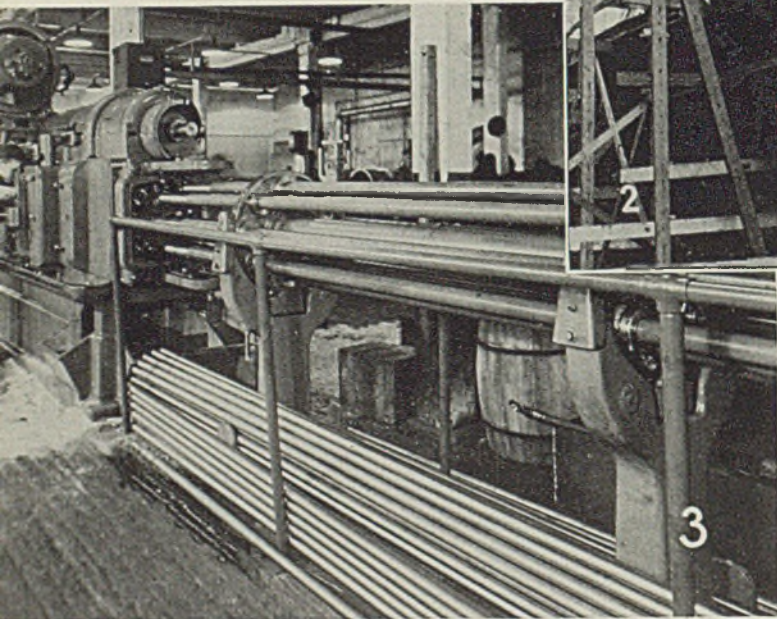
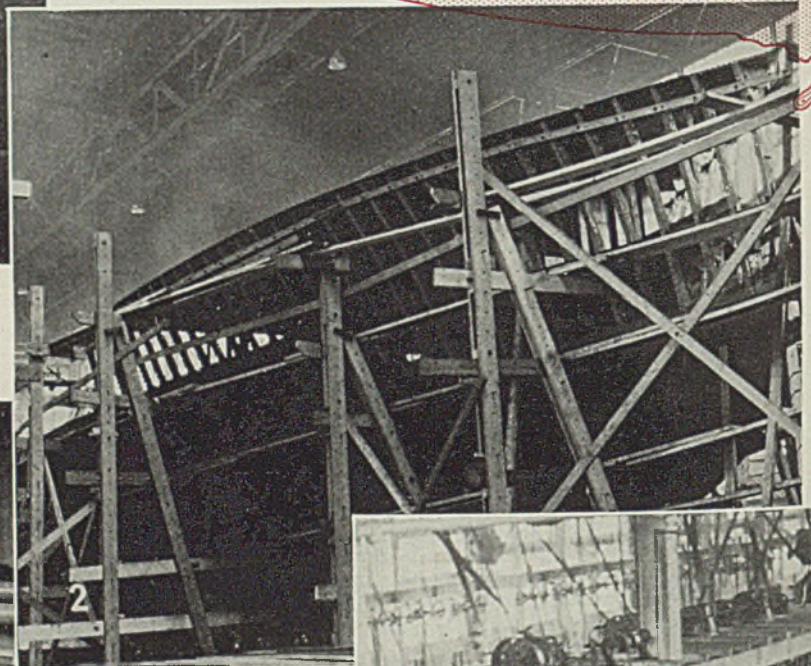
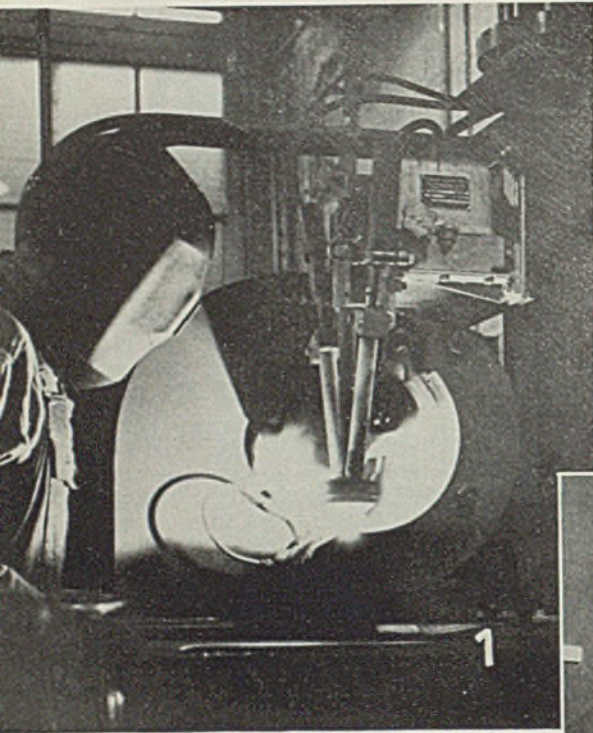
The method of application is similar to soldering. The rod has excellent depth penetration and alloying with aluminum base metal. It has a high strength bond, unusual corrosion resistance and good aluminum color match. It is easily machined, electroplated and polished, and can stand severe bending, working and forming. Applicable to practically all aluminum base alloys including castings, forgings, and wrought forms, it also is an excellent joining material for 18-8 stainless steel.

TABLE I—Costs of Building Experimental Inert Retarder

| No. of Parts | Name of Part | Unit Cost | Total Cost |
|--------------|--|---------------|------------|
| 4 | A Inside Bracket | \$21.55 | \$86.20 |
| 4 | B Outside Bracket | 32.84 | 131.36 |
| 1 | C Inside Shoe Beam | 84.94 | 84.94 |
| 1 | D Outside Shoe Beam | 69.27 | 69.27 |
| 1 | E Track Rail | Not included. | |
| 4 | F Inside Clamp | 2.37 | 9.48 |
| 1 | Set of Miscellaneous Parts, Shims, Plates, Pins, Bolts, Etc. | | 35.00 |
| | Total | | \$416.25 |

INDUSTRIAL CANADA

AT W N A

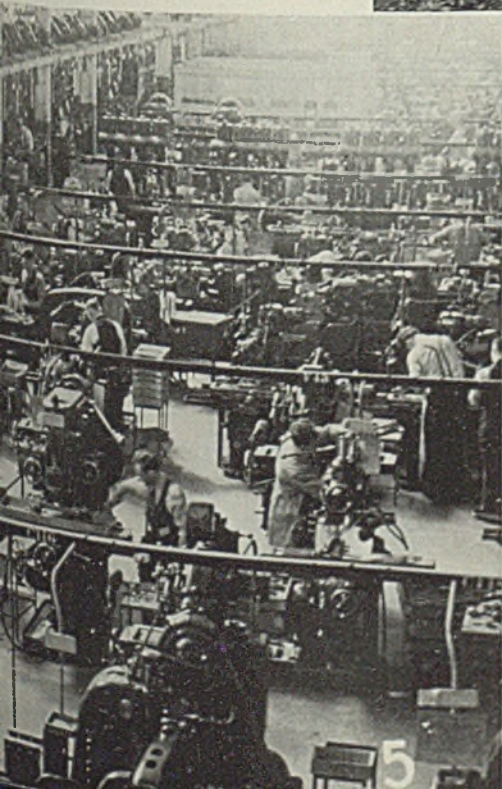
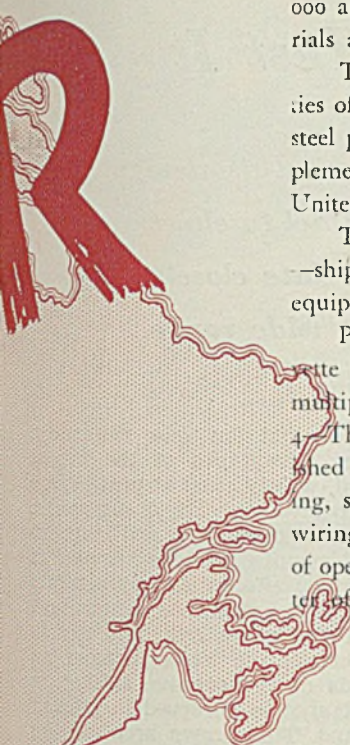


■ CANADA'S role as supplier of war materials to the United Kingdom has necessitated large-scale expansion in the Dominion's metalworking and metal producing industries. New plant construction completed or under way aggregates nearly \$200,000,000 and is estimated to have a capacity for producing \$800,000,000 worth of war materials annually.

To aid in this expansion, United States manufacturers have supplied large quantities of machine tools and other equipment. More than a million gross tons of iron and steel products were shipped to the Dominion in the first eight months this year to supplement production of Canada's own mills. The Dominion ranks second only to the United Kingdom as an iron and steel customer of the United States.

The expansion program includes capacity for practically all types of war materials—ships, guns, shells, aircraft, mechanical ground transport units, instruments, electrical equipment and explosives.

Photos: 1—Welding clips for Bren guns. 2—The sleek hull of a Canadian corvette takes form. Note knock-down scaffolding. 3—Lengths of steel, feeding into a multiple spindle automatic, start to become countless 40-millimeter anti-aircraft shells. 4—The Canadian Bren gun, from the shapeless lump of steel, right, to business-like finished product, left. With 75 per cent or more of the original metal removed in machining, speed really counts. 5—Large machine shop in Canadian Bren gun plant. Note wiring ducts that permit quick rearrangement of machines for most efficient sequence of operations. 6—Canadian soldiers testing a finished Bren gun. 7—Gaging outside diameter of shells. . . . Canadian official photos, passed by censor.



S T R E T C H I T

. To Test It

Important because it permits more accurate grading is this new method of measuring the attachment of porcelain enamel to sheet metal. Test results immune to gage variations, correlate closely with impact and microscopic test values throughout wide range

By J. E. SAMS
American Rolling Mill Co.
Middletown, O.

■ IN ALL porcelain enameling work it is essential to have some measure of the attachment of the porcelain enamel to the metal underneath. However, the physical and chemical characteristics of this attachment make it difficult to measure the force necessary to separate the enamel from the metal. If fragments of enamel continue to cling to the metal at a spot subjected to distortion, a degree of adherence is considered to exist. This permits judging the attachment by such methods as bending (1) and impact testing (4, 5, 6). Other methods include sticking (2, 3) and microscopic examination (7, 8, 9, 10) of the metal-enamel interface. See bibliog-

From paper presented at Fifth Porcelain Enamel Institute forum, University of Illinois, Urbana, Ill., Oct. 16-18, 1940.

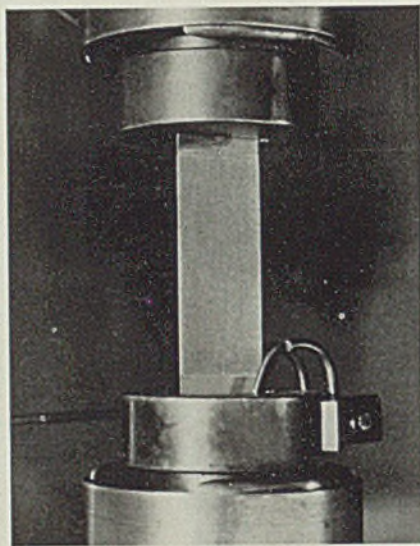


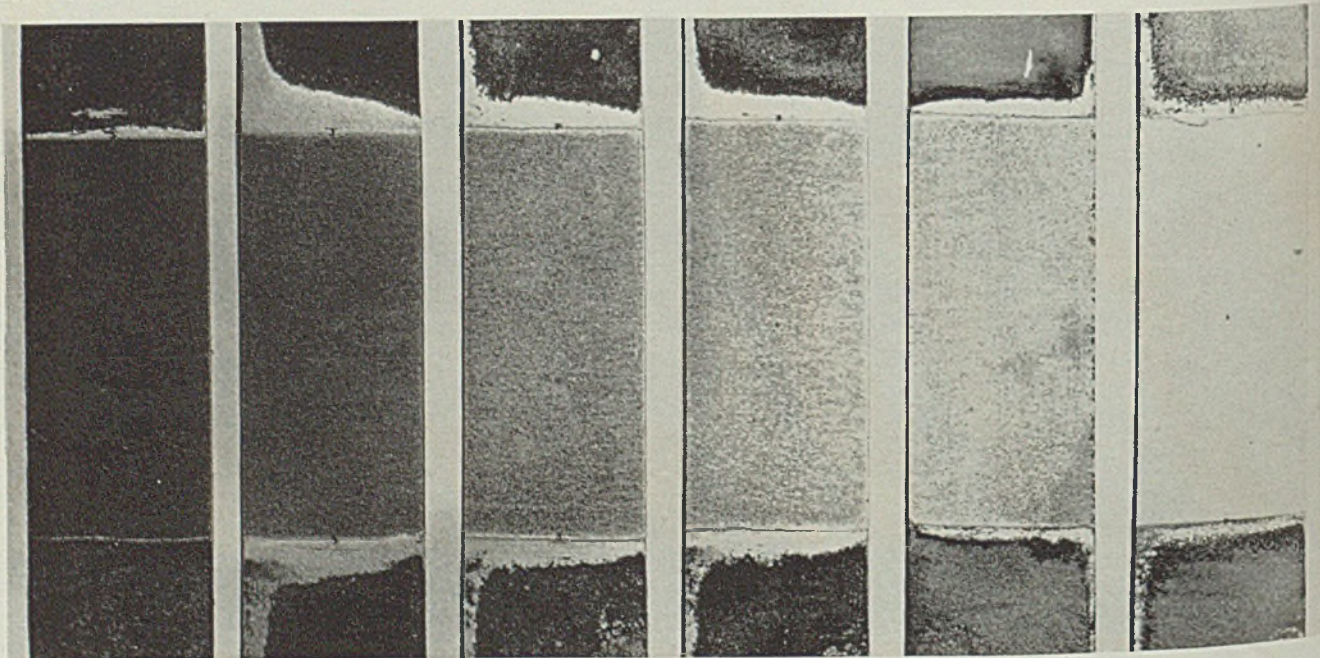
Fig. 1—Typical specimen being stretch tested in a tensile machine

raphy at end for these references.

Chief advantages of the impact method, widely used at present, are that it involves simple equipment, is quickly completed and comparison of results between samples of same gage affords a fairly accurate index of the adherence. In this test, within the gages suited to the dimensions of the test equipment, an analysis of the concave side of an impact spot is observed in grading the bond. This drawn area may be considered to be comprised of a series of concentric rings of infinitely narrow width, each differing from the adjoining ring by a minute percentage of stretch or draw. The time-saving factor possibly is the largest contributor to the popularity of the impact test.

However, a careful consideration of this test leads to the conclusion that the impact test areas are produced essentially by stretching. On

Fig. 2—Grades ranging from excellent, left, to very poor, right, are easily established as shown by this possible system. Dark specimens, left, have lost less enamel during the test stretch



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With specialization the order of the day, Grinnell Company specializes on the task of making pipe serve industry better. Whatever your piping requirements, the experience and facilities of this company will provide the means of doing it better. It's our business . . . and we've been at it for over 90 years. Grinnell Co., Inc., Executive Offices, Providence, R. I. Branch offices in principal cities.

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HERE'S A MERCHANDISING AID



Some of the U-S-S Quality Symbols now appearing on thousands of finished products and available to manufacturers fabricating from U-S-S Steels.



TRADE-MARK FOR U-S-S STEELS for general use. This basic label is designed for products manufactured from U-S-S Steels, applying to the general groups of steels rather than to specific grades.

TRADE-MARK FOR U-S-S STAINLESS STEEL WARE OR PARTS. Proves that only the finest Stainless Steel has been used. Where Stainless Steel is only a feature or trim to a product, this seal provides additional sales appeal.

TRADE-MARK U-S-S VITRENAMEL FOR PORCELAIN ENAMELED PRODUCTS OR PARTS. A seal which clearly indicates that the parts which can't be seen are chosen with as much care and thought of quality as those which can.

TRADE-MARK FOR U-S-S COPPER STEEL where the manufacturer employs copper steel because of its superior life under certain conditions. This seal gives his product the sales benefit of his choice.

TRADE-MARK FOR U-S-S PREMIER SPRING WIRE. Springs are usually a "hidden value." This tag brings the quality of their steel to the attention of the salesman and customer alike.

➔ **Manufacturers of steel products find U·S·S trade-mark promotion a new aid to retail selling**



THE retail salesman, whether he sells equipment for kitchen, laundry or bath or any of the countless specialties for home, farm or office, is forced to bring out all his reserves in selling to consumers today. They want facts—plenty of them. Proof of quality—unquestioned proof.

For this reason, an effort was made to aid manufacturers to translate their choice of U·S·S Steels into terms of increased sales. The result was our U·S·S Steel Quality Symbol—a mark which gives added prestige and character to any product and gives the retail salesman a powerful selling aid.

Actual point-of-sale support was given to this move. Through national advertising and promotion, the consumer has been educated in the purchase of articles containing steel—he has been shown the importance of looking for the U·S·S Quality Symbol when buying anything made from steel. He is being told that by this sign he will know the manufacturer has used the best steel for its purpose money can buy.

Thousands of inquiries attest the power of this advertising. Excellent cooperation and interest have been shown by retailers. The manufacturers using this FREE SELLING AID report such good results that they plan to tie in stronger than ever in 1940.

If you are interested in knowing how you, too, may have this FREE merchandising help, we will gladly give complete information on request, furnish unquestioned proof that *the U·S·S trade-mark helps sell goods more readily.*

AMERICAN STEEL & WIRE COMPANY,
Cleveland, Chicago and New York

CARNEGIE-ILLINOIS STEEL CORPORATION,
Pittsburgh and Chicago

COLUMBIA STEEL COMPANY,
San Francisco

TENNESSEE COAL, IRON & RAILROAD COMPANY,
Birmingham

United States Steel Export Company, New York



TRADE-MARK FOR U·S·S COR-TEN FOR MOBILE EQUIPMENT. The COR-TEN steel ties in admirably with impressive advertising for remarkable steel. Marks equipment having maximum ductility with reduced weight equal strength.

TRADE-MARK FOR U·S·S MAN-TEN where abrasion resistance is stressed. Equipment bearing this plate indicates the manufacturer has exercised care to employ the steel which will give best results under certain conditions.

**UNITED
STATES
STEEL**

this basis it is considered feasible to elongate flat enameled specimens to provide a fractured enamel surface affording a more easily graded series of specimens and giving tests directly reproducible and independent of sheet thickness. With the impact test, results of tests on different gages are not comparable due to the differences in force distribution as the thickness of the specimen increases. While large impact test areas produced with larger equipment might be more truly representative than the present impact spots, even so a controlled ratio of the depth of impression to the diameter of the impact would be difficult to maintain. For this reason the flat stretched specimens appear to be superior even to a semi-controlled impact test. At the present stage of development, the flat stretched type of sample may be more useful in the laboratory where precision is more important than speed. While the stretch test is limited to flat specimens, it has been found that microscopic appearance of the enamel-steel interface is directly associated with adherence so that method provides a good means of examining irregular enameled surfaces.

Stretch samples may be metal strips of any gage with the mid-section enameled. A sample 2 inches wide provides a grading area free of any edge effects from shearing or enameling. Length of the enameled section may vary without any appreciable effect upon the test. A 4-inch long test area has been chosen because a 2 x 4-inch grading area lends itself nicely to visual observation. Too large a test area makes testing difficult while one too small may prove to be nonrepresentative.

Portions of the sample extending from each end of the enameled sec-

tion are held in the grips of the stretching machine. Length may vary, depending on the amount of surface necessary for the grips. Both 2 and 3½-inch grip lengths have been used satisfactorily. The grip areas are wiped free of enamel before firing to assist in holding. Gage marks exactly 4 inches apart are placed symmetrically on one side of the sample. These permit measuring the amount of stretch



Fig. 3—Sample showing effect of stretch strain lines in the metal

by use of calipers and a finely divided scale. After coating with enamel in the regular manner, the portions at the ends beyond the gage marks are brushed off before the piece is fired.

Per Cent Elongation: Records show that ingot iron sheet samples drawn 5 per cent or more have definitely exceeded the elastic range and are being plastically deformed. A percentage not greater than 15 prevents reaching the ultimate strength with resultant necking down and possible breaking. These facts, coupled with the appearance of samples tested in various stages of stretch from 1 to 12 per cent elongation indicated the tentative choice of 8 per cent as the standard elongation for all stretch tests. This value appears to give excellent results.

Gage: Specimens of any gage

may be stretched, assuming the tensile testing equipment can handle the load. Whereas impact spots are difficult to compare in samples of different gage because the spots are different shapes, the uniformity of stretched surfaces enables one to make comparisons easily regardless of gage of the material.

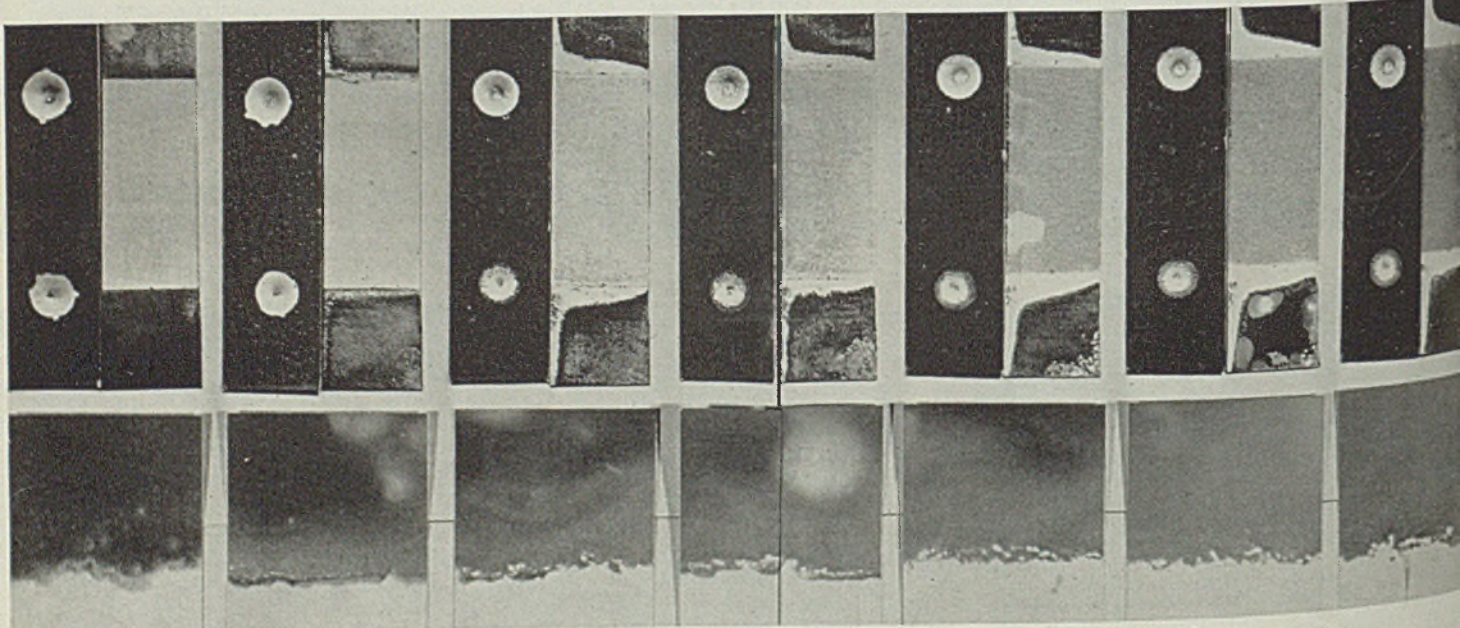
Rate of Elongation: Several stretch specimens were prepared similarly from a 20-gage sheet to determine if the rate of elongation affected the appearance of the stretched sample. Rates ranging from 0.087 to 8.70 inches per minute were tried, and the fractured surfaces appeared very much alike. Additional specimens from the same sheet were blanked in the shape of an Izod impact-tensile sample and enameled. When tested in an Izod impact machine to attain a speed of stretch equivalent to that obtained by weight dropping showed close correlation between the samples pulled on the tensile machine. Thus rate of elongation appears not critical.

Direction of rolling likewise seems to have little influence as in several instances samples were selected from a sheet, one with its length parallel to the rolling direction and the other transverse to the rolling direction with no significant differences between samples being noted when tested.

Strain lines: Some enamel samples when stretched show alternate light and dark areas caused by stretcher-strain lines in the middle. The difference in degree of bond is only apparent because of the nature of the strain line. It is considered safe to judge the adherence

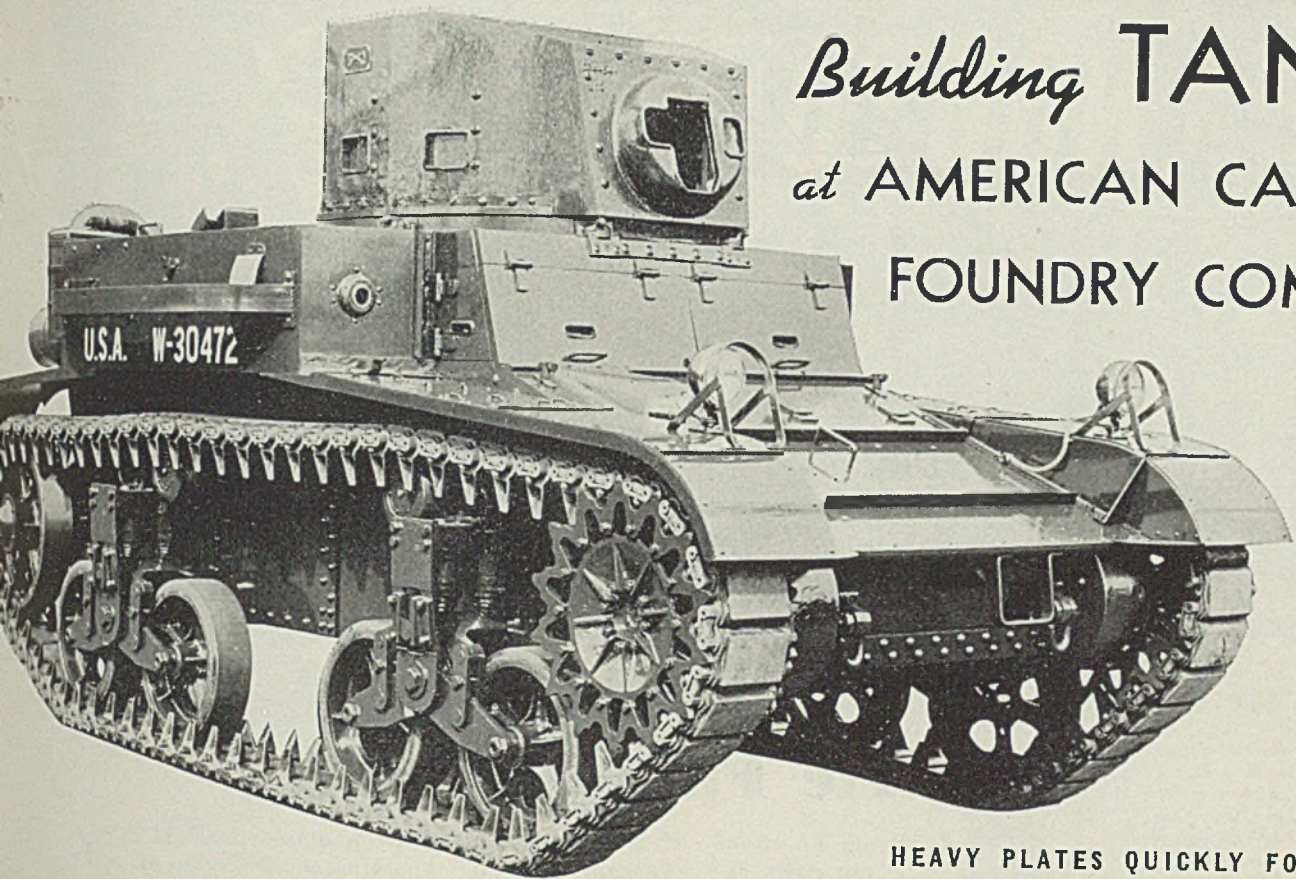
(Please turn to Page 96)

Fig. 4—This series of samples shows close correlation between results of impact stretch and microscopic methods of testing. From left to right, samples represent firing at 1600 degrees Fahr. for periods varying from 1 to 9½ minutes



STEEL

STEELWELD *Bending Presses*



Building **TANKS**
at AMERICAN CAR AND
FOUNDRY COMPANY

**HEAVY PLATES QUICKLY FORMED
HEAT-TREATED ARMOR PLATES STRAIGHTENED**

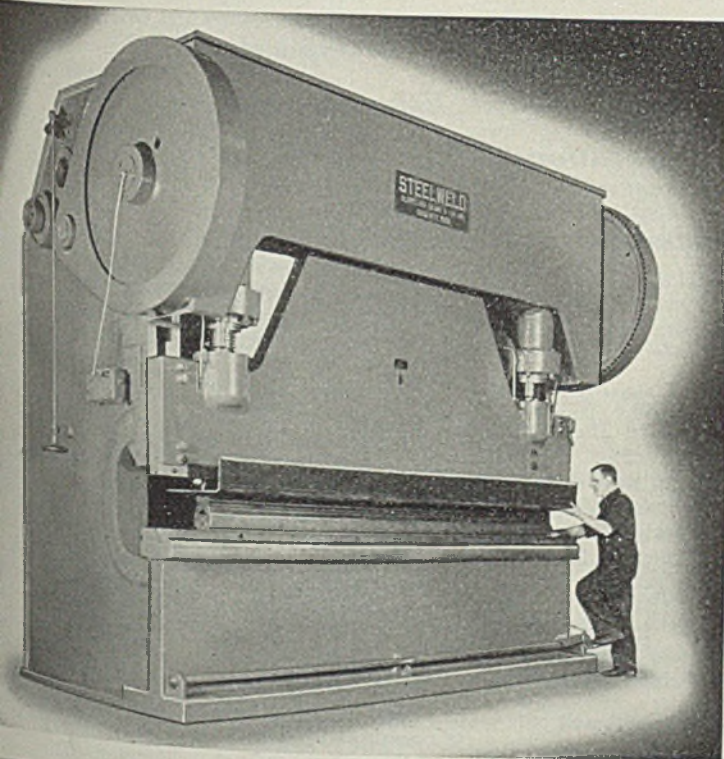
Three Steelweld Presses are doing heavy production work in the plants of American Car and Foundry Company. Three more large ones are being made for them. One of these will be the largest Steelweld Press ever built.

Steelweld Presses are serving many plants working on defense equipment. Plate is easily bent, formed and multi-punched to close tolerances. Steelwelds are especially adaptable to the quick straightening of heavy heat-treated armor plates.

It will pay you to investigate the many possibilities of this modern and proven tool.



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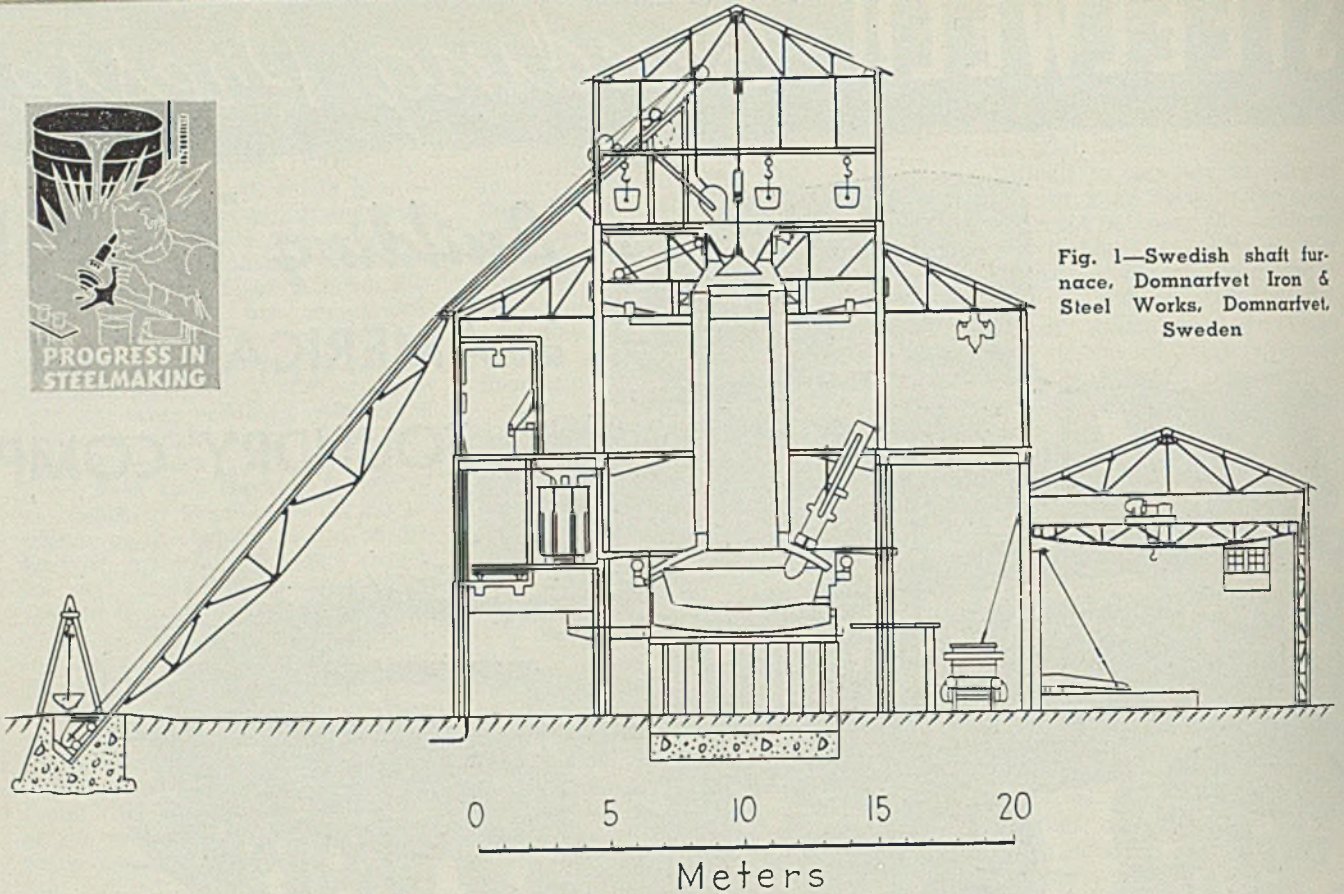


Fig. 1—Swedish shaft furnace, Domnarvret Iron & Steel Works, Domnarvret, Sweden

Electric Furnace Iron

Part I

Smelting iron ore in Sweden in high-shaft and pit-type electric furnaces involves use of charcoal and coke. Exhaust gases are recycled or used for auxiliary operations. Type of flux varies

■ **ARC FURNACES** of the direct heating series and equipped with two or more electrodes suspended from the roof are used in electric smelting of iron ore at the present time. Only two general types are in operation: (1) the Electrometalls or high-shaft furnace of Sweden, and (2) the low-shaft or pit-type furnace as offered by Tysland-Hole and Siemens-Halske.

The Electrometalls furnace shown in Fig. 1, is the highest development of this type of furnace today.¹ The trend in the lines, have kept pace with modern blast-furnace design. The high-shaft furnace lends itself to skip filling and is fitted with tuyeres immediately under the crucible roof, whereby the gases are recycled and the roof preserved.

Failure of the Electrometalls furnace in Norway, because of its inability to meet silicon requirements and to use coke as the fuel, led to trials of the pit-type furnace, which is shown in an intermediate stage

¹References at end of article.

By **CHARLES HART**

President
Delaware River Steel Co.
Chester, Pa.

in Fig. 4, and which found its greatest perfection in the furnace designed by Hole¹ (Fig. 3). This type of furnace is now being installed in the greatest number throughout the world. It is lateral filled, with electrodes at the angles of an equilateral triangle. The Siemens-Halske² type (Fig. 2) is essentially the same as to electrode arrangement, but is center filled, which permits mechanical charging.

Electrodes Too Small

The inadequacy of the available electrodes became apparent in the early efforts at electric smelting. The early experiments with the

From a paper presented at the Pittsburgh meeting of the American Institute of Mining and Metallurgical Engineers, April 1940.

Electrometalls furnace required electrodes with a cross-sectional area of 242 square inches, three in number, made up of smaller ones bound together, which were so short that butt-end loss was excessive and amounted to as much as 40 per cent in extreme cases. The prefabricated electrode³ as now produced has met all requirements, in that practically any diameter within reason is available. Excessive loss is avoided by joining the ends by screw threads, and these electrodes are essentially continuous. The Soederberg electrode⁴ consists of sheet-iron tubes welded in place and filled with electrode material as required, and in effect are continuous. The Electrometalls furnace is equipped with eight Soederberg electrodes 28-inch diameter. The Spigerverks furnace (Fig. 3) has three electrodes of the same type 43 inches diameter.

The five Electrometalls furnaces have an electric power intake of 6300 kilowatts each, and produce a pig iron suitable for the Thomas



"YOU'LL have to shut down at three today," the Superintendent of a northwestern wood-working plant said to his shop foreman. "... Kiln's tied up again with heating trouble!"

The plant was swamped with orders—like many another shop today. And repeated valve trouble in the steam line at the kiln meant falling farther behind on deliveries.

Preventive Maintenance was the only answer. For it's the only way of solving piping problems permanently. Yet, Preventive Maintenance is a simple technique—just a matter of *being sure* the installation is right, and the valves and fittings the best for service conditions.

The Superintendent saw the waste in ordinary repair—he called in H. E. O., the Crane Man. His wide experience would help to remedy the trouble quickly and surely.

Here's what the two men found: Steam was piped from the boiler with a four-inch line equipped with a four-inch pressure-reducing valve.

This case is based on the personal experience of H. E. O., a Crane Representative in the St. Paul Branch.

And there was the source of the trouble! The valve was much too large. It couldn't operate properly at the low pressure setting required. Severe wire-drawing cut the seat and disc. The valve leaked—pressure went up—the kiln temperature couldn't be controlled.

Preventive Maintenance counseled replacement with a two-inch pressure regulator. It would give ample steam for heating the kiln. It would give finer control without restricting operation of the automatic valve mechanism. A Crane No. 960 brass regulator was put in the line.

Results: No more interruption of kiln operation; no more shop time lost for lack of material. Another plant superintendent knows the value of Preventive Maintenance. Also knows the Crane Man can help him get most for piping maintenance dollars. Because Crane is not only the source of valves and fittings for every service, but of accurate information on their proper application as well.

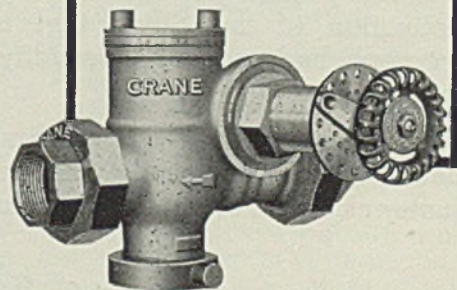
REDUCED PRESSURES KEPT AT STEADY FLOW WITH CRANE 960's

Cutting down pressure is only part of the job of pressure reducing. What you also want is a steady flow in the service line. You get both in these sturdy-built Crane No. 960 Brass Pressure Regulators for steam or air.

The 960 is ideal for Preventive Maintenance on modern process lines—on vulcanizers, cookers, driers, paper machines, air tools, air blasts, in heating systems.

Unlike ordinary reducing valves, the Crane 960 maintains reduced pressure at the point desired regardless of how much steam or air is being used. It will not permit pressure build-up when service line is idle.

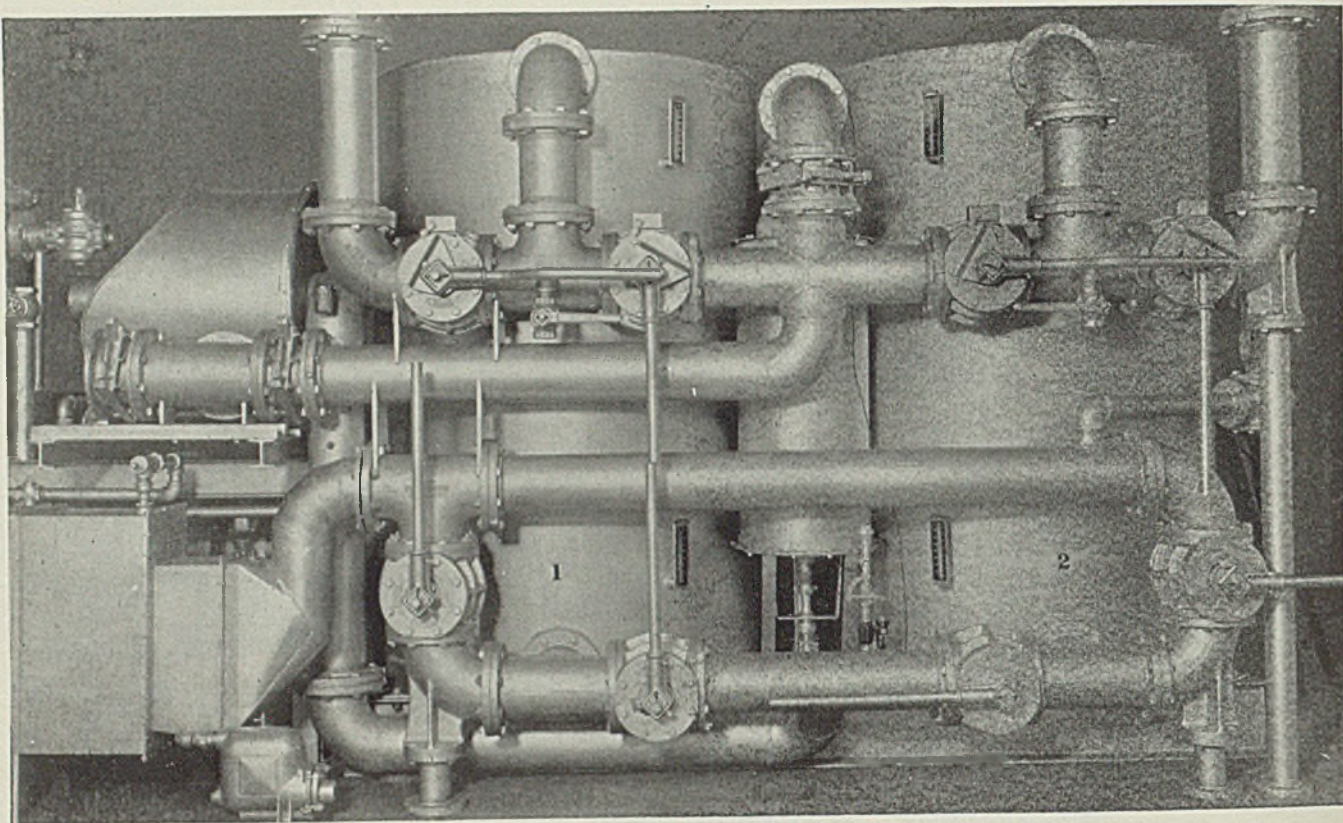
Crane 960's are available for reduced pressure ranges of 5 to 30 pounds and 31 to 200 pounds. Operation is simple; ready accessibility permits easy inspection and servicing. In 6 sizes up to 2". Page 415 of your Crane No. 52 Catalog gives complete specifications.



CRANE

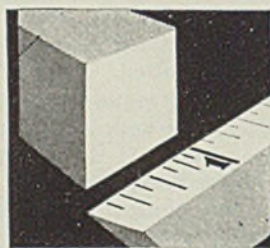
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VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS



Go as far as you like . . . with **KEMP** of **BALTIMORE**

Kemp Dryers will give you any required degree of desiccation down to the commercial ultimate—a dew point of minus 76°C. Available with single or twin towers for intermittent or continuous operation, standard Kemp units are built from 10 to 100,000 c. f. per minute capacity to operate at pressure from atmospheric to 2,500 pounds per square inch. Activation of the Silica Gel is accomplished by gas, electricity, or steam as desired.

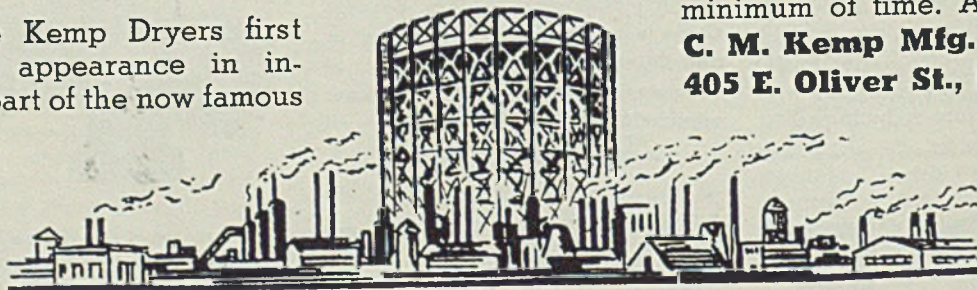


*SILICA GEL which has millions of ultra-microscopic pores, removes moisture by a combination of surface adsorption and capillary attraction. It is reliably estimated that the interior pore surface of one cubic inch of Silica Gel is in excess of 50,000 square feet.

While these Kemp Dryers first made their appearance in industry as a part of the now famous

Kemp Atmos-Gas Producer (fired by the patented and exclusive Kemp Industrial Carburetor), this comprehensive 1940 line of dryers is designed for operation with all types of atmosphere machines for the drying of gases, liquids, or solids.

Write for the latest Dryer Bulletin, and then if you don't see what you want, *ask for it*. Kemp is prepared to design and build to your special requirements in a minimum of time. Address **The C. M. Kemp Mfg. Company, 405 E. Oliver St., Balto., Md.**



KEMP of **BALTIMORE**

Gilchrist steel process, using a high-phosphorus sintered magnetite. This improved furnace uses two-thirds charcoal and one-third high-ash coke and coke breeze. Electrometals electrode consumption is about 20 pounds per ton of pig iron produced, with a power consumption of 2500 kilowatt hours.

The high-shaft furnace, although eminently successful in Sweden, failed to meet the requirements in Norway because of the lessened electrical resistance of coke when heated as compared with charcoal, and on this account failed to produce high-silicon foundry iron.

Tysland⁷ brought forward the Tysland furnace in 1922, after experimentation which resulted in a direct-heating series arc type, still with an open top. It was tried out at the Christiania Spigerverks (Oslo Nail Works) in 1925. Ivar Hole⁸ took over in 1928 and improved upon the Tysland design by building an airtight nonexplosive furnace, essentially the same as shown in Fig. 4 except that it was equipped with gas-exhausting machinery. Soederberg electrodes are used as indicated by the stamping room as shown. The latest arrangement⁹ (Fig. 3) is trefoil in character, with electrodes placed at the angles of an equilateral triangle. Lateral charging is maintained and its advantages may be seen in the absence of erosion at the charging hoppers, as compared with that shown adjacent to each electrode—an erosion fittingly attributed to turbulence.¹¹

The Radex brick are made in Austria, either of magnesite or of chrome and magnesite mixed. Bricks of equal quality to this high-temperature brick are produced by the American refractory companies. The Chamotte brick are a first-grade fire-clay brick.

Location of the charging doors has a beneficial effect on electrode consumption, which is placed at 17 to 22 pounds per ton. Owing to the use of coke, this compares most favorably with the Electrometalls practice on charcoal. The electrodes can be increased in number and as much as 175 volts may be used. It is possible therefore to greatly increase the daily production of 100 tons now possible from a 12,000-kilovolt ampere furnace. Practically all carbonaceous materials serve as fuel, but a preference for coke and coke breeze is indicated.

Efficiency of Furnaces

In Table I relative results obtained on the two furnaces just described are shown.¹²

The Spigerverks furnace had a rating of 9600 kilowatts, but the highest reached was 7500 kilowatts. It is evident that situation would have been helped materially had

this furnace worked on coke, for which it is particularly designed. Therefore, all comparisons are unfair to the Norwegian furnace. The real test for these furnaces is in their commercial results. The Electrometalls furnace shows a material advantage over the Spigerverks in consumption of charcoal and current, and by these standards a ratio of 11 to 10 in favor of the Swedish outfit is indicated. But in reality, by figuring the costs of the materials used, the commercial ra-

late A. E. Maccoun,⁸ is also shown.

The $\text{CO}_2:\text{CO}$ ratio in Table 2 is the true index of the relative efficiency of the two electric furnaces, while the Maccoun column, with reference to columns 1 and 2, indicates the relative value of the electric furnaces when compared with the blast furnace. In the former case only sufficient carbon is added to the charge to completely reduce the oxides pertinent to the operation, while in the latter the heat for fusion and other purposes is furnished by the combustion of the coke. The gases in each case respond to results obtained from the Mathesius formula,⁹ in that the Electrometalls analysis indicates some reduction above the tuyeres. The Spigerverks furnace, with neither tuyeres nor stock, indicates maximum reduction in the hearth. The Maccoun results show economy due to indirect reduction in the stack.

Blast Furnace Reactions

The normal blast furnace burns seven-eighths of the charged carbon completely to CO_2 , which is immediately converted to CO by the ever present incandescent coke, and at a point practically 50 feet below the stockline the CO_2 from the flux enters the gas stream. The various reactions as between the materials in the furnace result in a gas of the analysis shown in the third column of the table. A contributing factor to the efficiency of these three furnaces is the possibility of using the gases in auxiliary operations. Data covering this feature are shown in the table. It is impossible to convert the Spigerverks gas into electricity in competition with hydroelectric current, unless the cost of such power exceeds 2.33 mills per kilowatt-hour, because the current made from this gas in a modern reciprocating gas-engine plant would cost the same amount, and would be made up of 0.088-mill for operating costs with the balance chargeable to interest and depreciation. Its value as a fuel for other operations, figured at 0.9-mill per kilowatt-hour, equals approximately \$1 per ton on the pig iron produced.

The Electrometalls furnace gas shown has a lower energy value, but the reduction within the furnace was more effective owing to the recycling of the gas. Were it not for this feature, the carbon dioxide content would be 10 per cent or less and the gases would be proportionately more valuable for use as fuel.

The great volume of gas coming from the blast furnaces, as shown in Table 2, results from the nitrogen content in the air. The blast furnace is cited as being the most efficient of all the processes used in iron and steel metallurgy. The

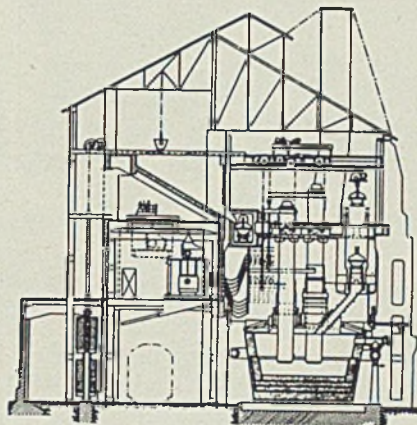


Fig. 2—Electric low-shaft furnace built by Siemens and Halske

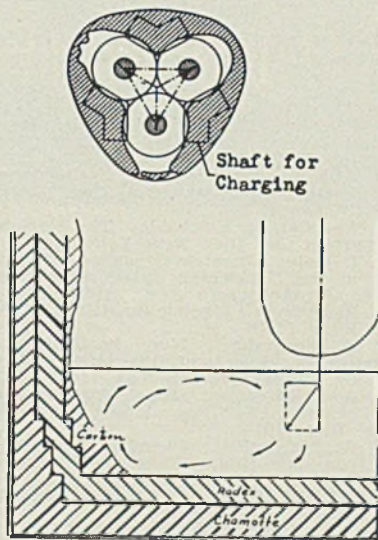


Fig. 3—Smelting zones, Spigerverks furnace at Imatra works, Finland. (From H. Willners, supplement to reference 2.)

tio changes to 5 to 4 in favor of the Tysland-Hole design.

A better gage of the efficiencies of the smelting furnaces is reflected in the analyses of the escaping gases. Table 2 gives a comparison of the gases from the Electrometalls and Spigerverks furnaces. These furnaces worked under the most favorable conditions. The analysis of the gas from a normal blast furnace equipped with a Gayley dry blast, as reported by the

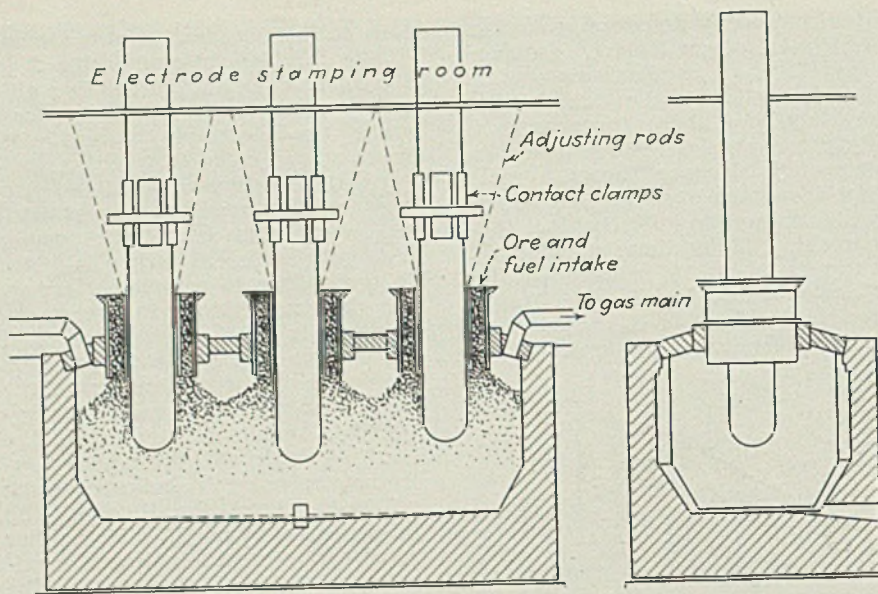


Fig. 4—Norwegian pit-type electric furnace

maximum heat value obtainable from the case quoted⁸ is 22,000,000 B.t.u. While the calorific value of the escaping gas is nearly 11,000,000 B.t.u., of which roughly 20 per cent is available for purposes other than in the furnace operation. This, however, is increased to 70 per cent when applied to furnaces equipped with reciprocating gas engines. It would seem, therefore, that the demands upon energy is based upon the work to be done. This work varies with the types of ores used, the value of the fuels, and the quality of the pig iron desired—and there is no short cut available. Rich gases indicate poor reductive reactions in the furnace.

The carbon dioxide content in the electric furnace is of such moment that burned lime is preferable as a flux, rather than the natural

stone. However, in the Swedish practice a preponderance of fines is undesirable. In Norway it has been found worth while to use calcium ferrite, made by the Rolfsen process, as a flux. This practice has the added feature of reducing the slag volume.

(Concluded in next week's issue)

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TABLE I—Comparison of Furnaces

| | Electro-Spigermetalls verks | Spigermetalls verks |
|--------------------------------------|-----------------------------|---------------------|
| Charcoal per gross ton, lb. | 810 | 887 |
| Electric energy per g.t., kw.-hr. | 2,040 | 2,166 |
| Yield of ore, % | 56.8 | 57 |
| Agglomerates in mix, % | 89.1 | 85.5 |
| Iron analyses, %: Si | 0.50 | 0.62 |
| Mn | 1.00 | 0.61 |
| Average electric load, kw. | 3,775 | 5,067 |
| Average daily production, gross tons | 44 | 56 |

TABLE II—Comparison of Gases

| Gases | Electro-Spigermetalls ² verks ² | Spigermetalls ² verks ² | Mac-coun ³ |
|--------------------------------------|---|---|-----------------------|
| Carbon dioxide, % | 23.00 | 15.00 | 16.23 |
| Carbon monoxide, % | 62.00 | 78.00 | 22.75 |
| Hydrogen, % | 1.50 | 1.00 | 0.02 |
| Methane, % | 1.50 | 1.00 | 1.39 |
| Nitrogen, % | 1.50 | 1.00 | 58.86 |
| Ratio CO ₂ to CO | 1:2.69 | 1:5.20 | 1:1.49 |
| Gas per ton, cu. ft. | 18,259 | 22,600 | 132,524 |
| Heat value per cu. ft., B.t.u. | 279 | 292 | 80 |
| Temperature of escaping gas, deg. F. | 392 | 480 | 324 |

Addendum No. 2 Adopted

The manufacturers Standardization society of the Valve and Fittings Industry, 420 Lexington avenue, New York, announces the adoption of MSS "Standard Practice" No. SP-25-1936. This is intended to clarify Rule 2b and also includes in Rule

4b the products made of alloy steels recently added to American Standard B16e.

New Insulation Has Many Applications

Industrials Inc., 1530 Chestnut street, Philadelphia, announces a new insulation material for use on all types of ovens, furnaces, boilers, breechings, checker chambers and steam piping. It also may be used for other applications in reducing heat losses by conduction, convection and radiation.

The material, called Atoz, is available in dry form and is mixed to the proper consistency by the addition of water alone. It is readily spread on horizontal or vertical surfaces and, because of its adhesive qualities, is particularly adaptable to covering rounded shapes and irregular surfaces.

Its thermal coefficient is 0.33 B.t.u. per hour per square foot per degree Fahr. for a 1-inch thickness. Its acoustical coefficient is 0.65 at a frequency of 512 cycles. One hundred pounds of the material will cover approximately 80 square feet to a thickness of 1 inch. It adheres to wood, steel, glass or any other surface—is easy to patch, and can be cut, nailed or screwed. It also withstands severe vibration and may be colored or painted.

New Process Increases Speed of Electroplating

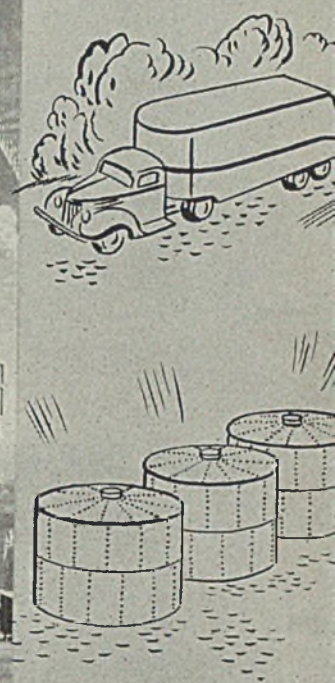
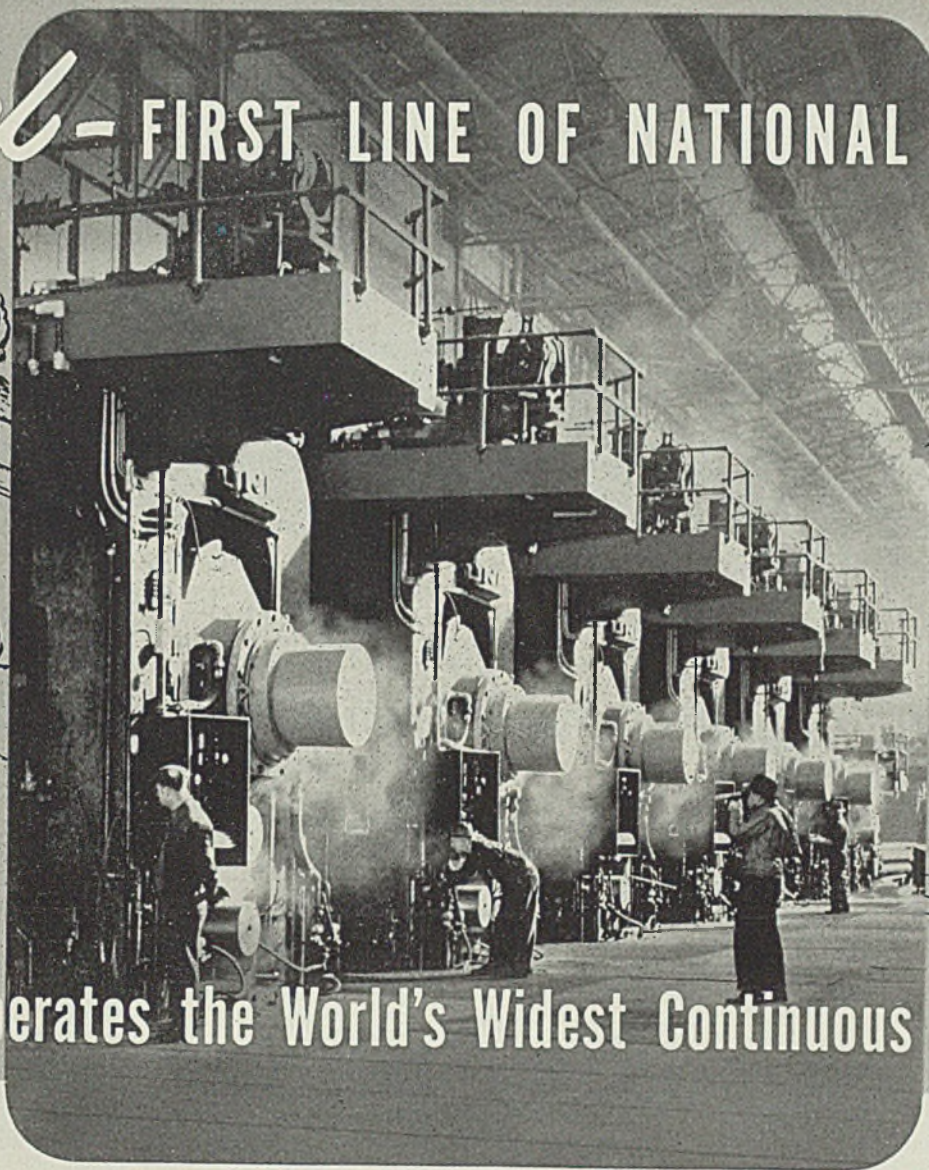
Rapid, uniformly bright deposits, free from pits and other imperfections, are features of a new high-speed copper electroplating process recently announced by Electroplating division of E. I. du Pont de Nemours & Co., Wilmington, Del. It makes possible heavy deposits of brass, 0.001-inch or more in thickness.

Prepared salts provide a simple, quick preparation of the new bath, which will plate immediately, eliminating the "breaking in" period.

The process operates without polarization at high anode current densities, giving proper composition and color of plate and the purity necessary to maintain efficient operation of the bath.

The relatively low temperature of operation, 40 to 50 degrees Cent. (105 to 125 degrees Fahr.) assures ease of control and economical operation. A uniform bright yellow color may be obtained over a wide range of current densities. This means that uniform color over recessed objects is now possible. The characteristics of the deposit may be constantly maintained throughout the process by means of definite chemical control.

Steel - FIRST LINE OF NATIONAL DEFENSE



Republic Operates the World's Widest Continuous Strip Mills

The 98-inch hot and cold strip mills in the Cleveland plant of Republic are the widest, fastest and most modern continuous strip mills in the world. Steel rolls from these mills at a speed of 24 miles an hour—up to 91 inches in width—in a wide range of analyses and finishes—to be coiled or cut into sheets.

These mills, completed three years ago to serve the peacetime needs of America, gave to automotive manufacturers, tank makers and other fabricators finely-finished sheets wider than ever before were available—helped speed the making and cut the production costs of many products.

Today, these mills are rolling huge quantities of steel—sometimes as much as

4000 tons in a single day. And now, in these mills along the lazy Cuyahoga River and far from scenes of conflict, more than two thousand men who know steel work in safety to insure the comfort and progress of America—and its greater security.

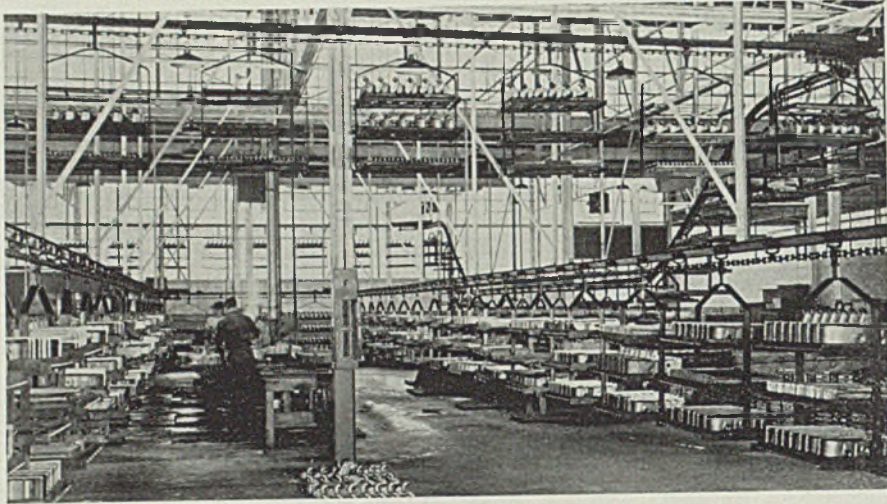
Yet this is only one of the many improvements in plant facilities made by Republic that will help our country in any national emergency when the need is paramount for more and better *steel—first line of national defense.*

The line of steels and steel products manufactured by Republic is so diversified that we have prepared a complete listing in Booklet No. 199. A copy will be sent you upon request.

REPUBLIC STEEL CORPORATION • CLEVELAND, OHIO

Berger Manufacturing Division • Niles Steel Products Division • Steel and Tubes Division • Union Drawn Steel Division • Ingersoll Steel Company





Conveyorization of radiator manufacture saves floor space and eliminates trucking and manual handling. Here is part of a 1220-foot tank delivery conveyor, with triple-deck carriers. Photos courtesy Mechanical Handling Systems Inc., 4600 Nancy, Detroit

New Radiator Plant Spotlights Efficient Handling

PART I

■ MODERN METHODS of fabricating, assembling, testing and painting automobile radiators and heater cores have been correlated and integrated with a network of overhead conveyor systems in the new 240 x 600-foot plant of Fedders Mfg. Co., Owosso, Mich., to the end that production of 6000 units per day is possible with an absolute minimum of manual movement of parts or assemblies in transit.

Fourteen separate conveyor systems are used to move material through various stages of fabrication, each designed with fixtures, hooks or carriers particularly adapted to the work at that point and each geared to the proper speed with relation to other conveyors so that a synchronized flow is achieved through the entire plant. Total length of the conveyor systems is

Unusually complete mechanical handling systems aid production of 6000 automobile radiators daily. Fourteen separate conveyors, totaling over a mile in length, synchronize and correlate fabricating operations. Core ribbons formed at 200 feet per minute. A 680-foot conveyor system supplies coils of ribbon to rollers. A triple-level conveyor facilitates core assembly. Both sides of assembled core are soldered automatically on special conveyor

close to 5600 feet, or well over one mile.

A typical automobile radiator is made up of a core formed from strips of copper and brass, soldered

at their edges; a 2-piece top tank of brass; a bottom tank of brass; inlet and outlet castings of malleable iron; sidewalls and sidewall reinforcement strips of terneplate; three tieclips of steel on the top tank; dome, dome cup and filler of brass, soldered to the top tank; overflow tube of brass, and lamp-wire clips. These various units are made in separate suboperations, routed on conveyors to assembly stations, the assembled radiator tested under air pressure, washed, spray painted, baked and packed for shipment.

Cores are formed from copper and brass ribbon, width depending upon depth of the radiator, average being around 3 inches. Copper and

Lines of presses, left, flank a belt conveyor which moves tank stampings, sidewall strips and reinforcing to assembly stations. Notice how the monorail track, right, is stepped down to bring the proper carrier tray flush with these benches where outer core strips are bent and lock seamed



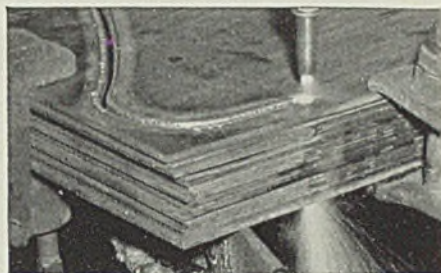
GOOD OPERATORS for Oxy-Acetylene Flame-Cutting Machines can be developed rapidly



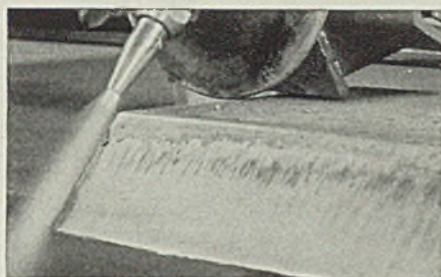
As industry faces production schedules which involve a need for shaping huge quantities of steel, oxy-acetylene flame-cutting can be used effectively to ease the burden which will be imposed on your machine tools.

By means of flame-cutting, steel of almost any commercially used size or thickness can be cut to any desired shape, and to relatively close tolerances. Usually little or no machining is required. Equally as important, operators of flame-cutting machines can be trained to do a good job in a short time—often in only a matter of weeks.

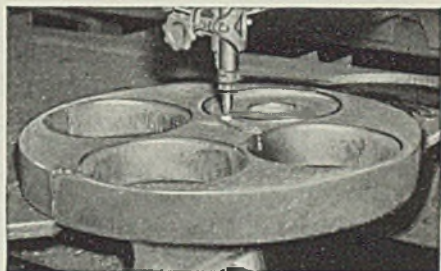
A few of the many types of work which operators of average training and ability are doing every day—using both stationary and portable flame-cutting machines—are shown in the pictures at the right.



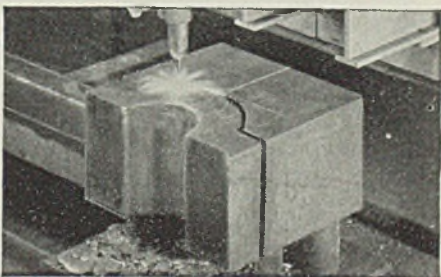
Stack-Cutting—tightly clamped stacks of plate can be flame-cut to shape rapidly and economically.



Bevel-Cutting—ability to bevel steel is valuable in plate-edge preparation for fabrication by welding.

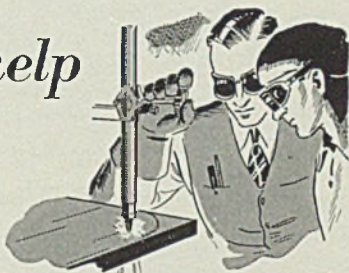


Circle-Cutting—true circles can be cut for the manufacture of parts such as gears, flanges and rings.



Heavy-Cutting—In addition to cutting light or medium steel, oxy-acetylene machines produce accurately shaped parts from heavy billets or forgings.

and *Linde* can help you train them



The Linde organization includes a staff of experienced engineers and service operators who can help you train operators and put flame-cutting to work at once in your plant. In addition, Linde can supply everything you need to use this process—gases, apparatus, and supplies.

If you would like to know more about how you can use oxy-acetylene flame-cutting, flame-hardening, welding, gouging, descaling and other related processes to maintain stepped-up construction and production schedules, ask Linde.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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



Offices in
Principal Cities

In Canada: Dominion Oxygen Company, Limited

LINDE OXYGEN • NITROGEN • HYDROGEN • OXWELD APPARATUS
UNION CARBIDE • PREST-O-LITE ACETYLENE • UNIONMELT WELDING

The words "Linde," "Prest-O-Lite," "Union," "Oxweld," and "Unionmelt" are trade marks of Units of Union Carbide and Carbon Corporation.



Facts YOU SHOULD KNOW ABOUT SPEED CASE STEEL

READ THE RECORD...

Performance Records from our customers show that SPEED CASE STEEL OUT-PERFORMS S.A.E. 1112, X1112, X1020, X1314, X1315, 1115 STEELS. Chart below shows comparison of Speed Case with 6 other steels.

| | MACHINABILITY SFPM. | DUCTILITY | STRENGTH and SHOCK | CARBURIZING |
|-------------------------|------------------------|------------------------|-----------------------|------------------------|
| SPEED CASE SAE 1112 | 220-300 140-170 | Very Good Poor | High Low | Excellent Poor |
| SPEED CASE SAE X1112 | 220-300 200-250 | Very Good Poor | High Low | Excellent Poor |
| SPEED CASE SAE X1020 | 220-300 120-130 | Very Good Very Good | High High | Excellent Excellent |
| SPEED CASE SAE X1314 | 220-300 140-155 | Very Good Fair | High Medium | Excellent Good |
| SPEED CASE SAE X1315 | 220-300 125-135 | Very Good Fair | High Medium | Excellent Good |
| SPEED CASE SAE 1115 | 220-300 125-145 | Very Good Very Good | High Medium | Excellent Good |

WRITE FOR FULL DETAILS ON SPEED CASE STEEL

Sole Licensee for Eastern States

THE FITZSIMONS COMPANY
YOUNGSTOWN, OHIO

WHAT IS SPEED CASE STEEL

Speed Case Steel is BY PROOF one of the best money making steels produced today. It excels in all requirements AT ONE TIME. Strength, Ductility, Carburizing qualities have NOT been sacrificed to obtain MONEY MAKING MACHINABILITY. Factory production records from users PROVE this. Every statement made in our advertising is backed by FACTS! SPEED CASE can make MORE MONEY for YOU!



Canadian Representative
PECKOVER'S Ltd.
Toronto, Ontario, Canada

Licensor
MONARCH STEEL COMPANY
HAMMOND CHICAGO INDIANAPOLIS

MANUFACTURERS OF COLD FINISHED CARBON AND ALLOY STEEL BARS!

Girls fold and rack inner strips for cores, then place them on conveyor trays at hand

brass ribbon is fed into rolling machines which form the special types of corrugations required at a speed of 200 feet per minute, automatically cutting the strip to length as it is formed. A 680-foot conveyor system, with carriers on 40-inch centers, supplies coils of copper and brass ribbon to the rolling machines.

Each core comprises a series of formed copper and brass ribbons or segments, each segment including an inner copper ribbon which is placed inside an outer brass ribbon, the latter folded to rectangular shape and the ends lockseamed. As the ribbons are cut to length they are placed on a core assembly conveyor which is 180 feet long and carries 100 fixtures with three shelves each. This conveyor passes by the rear of bending machines, and the chain is suspended at three levels so that each level of shelves will be brought flush with a certain group of bending machines, the latter all at the same level.

Travel from Conveyor to Conveyor

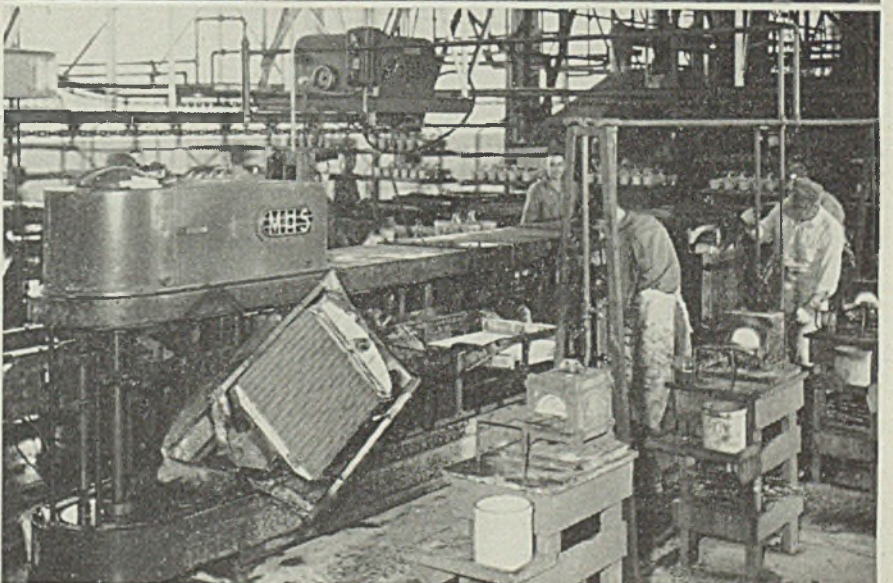
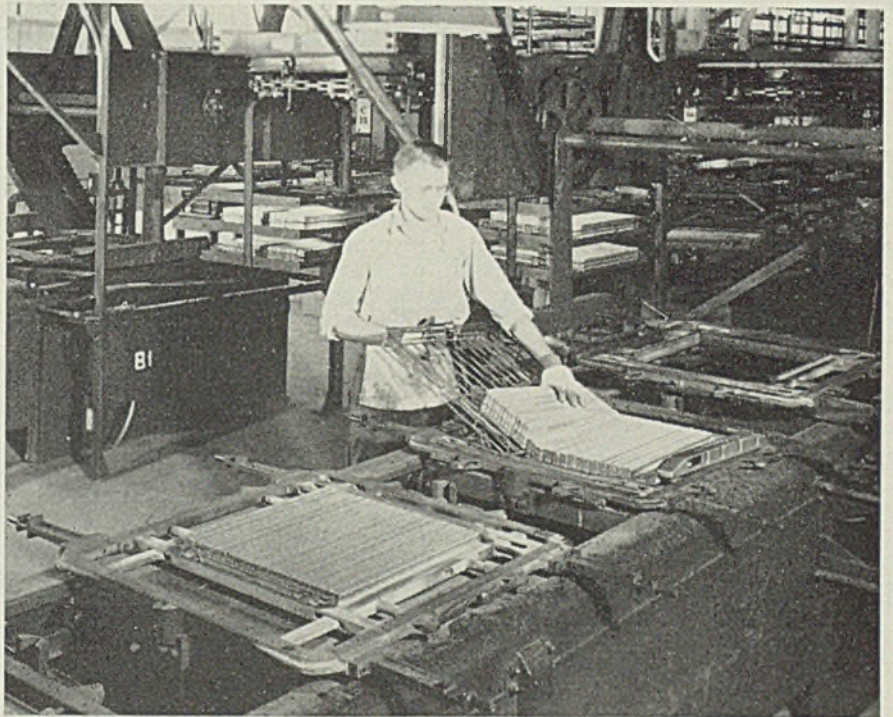
Thus, at one group of 12 machines, men take the outer brass strip from the cutting machine, locate it in the bender, actuate the machine which folds one end over against a die and lock seams the ends. Inner ribbons are folded by girls on a similar group of machines and the two assembled at a third group of benches. The assembled core units then are placed on the conveyor which moves them to the soldering conveyor.

The above-mentioned combination copper and brass units are assembled one next to the other to form the conventional "honeycomb" radiator core, perhaps 30 or 40 individual units being required for a core assembly. These units are locked into an aluminum frame resting on flat cast iron frame surface of the soldering conveyor. As the frames approach the solder, they are automatically removed from the plates and are placed over the solder pot, first being dipped into a flux bath, and then into the solder. The cores are immersed in flux and

(Please turn to Page 100)

Assembled inner and outer copper and brass strips comprising complete core are locked in frame carried along automatically to soldering tank where upper and lower surfaces are dipped into solder. Note overhead conveyor depositing empty frame at right

Core, assembled to top and bottom tanks, is hung on universal fixture traveling on conveyor loop, where hand soldering operations are performed quickly and conveniently



Training Apprentices for Special Work Affords Productive Years

Training apprentices to operate various groups of machines rather than to become all-around mechanics affords them two or three productive years. After a decade a large percentage of the men become specialists in their line of work. The accompanying article was the author's discussion of a paper, "Maintenance Shops in the Steel Plant" by T. R. Moxley, general master mechanic, Wheeling Steel Corp., Steubenville, O., presented at the annual convention of the Association of Iron and Steel Engineers, Chicago, Sept. 24

■ A FACTOR which should be considered before we decide to "sign up" a man for four years is: Are we entitled to take four years of a man's time without compensating him properly for the time spent, or prepare him for a special occupation since the modern trend seems to be in specializing? I know that a difference of opinion exists on these points and the value of mechanics developed by the latter method, but if we take 100 boys and start them through the "school of experience," the first four years are spent in acquiring fundamental

By R. D. WEARNE
Superintendent of Shops
Carnegie-Illinois Steel Corp.
Gary, Ind.

knowledge. It will then take another four to eight years to develop their skill and broaden their knowledge to that of a recognized good, all-around mechanic, while the latter system gives to the shop in two years a man capable of producing on one of the various machines work comparable to that produced by the more versatile apprentice with four to six years of training.

This modern trend is something that has come from mass production and the increasing demand for larger shops in centralized maintenance, where a journeyman machinist is not essential for every machine, and about 75 per cent of the boys who finish their apprenticeship will, at the end of two to three years, be found working on one of several groups of machines, either on cylindrical or plane surface work, with a small percentage possibly working on gear cutters. This means that we could possibly have

taken the same boys and in two years trained them to operate the same machines, giving them two to three productive years that under the apprentice system would have been used in training them to handle machines which we will not later ask them to operate.

At the end of 10 years, probably 90 per cent of the boys have become specialists in one line or the other, and from the remaining 10 per cent we probably will develop our supervisors, and it is my opinion that these are the boys we should choose earlier in their training period and to whom special effort should be applied in their training.

Many Machine Shops Obsolete

As to the cost of maintaining a large machine shop, if you have a modern shop of your own you can probably answer the question best yourself because a number of the larger machine shops in the industry at this time are more or less obsolete, making costs appear to be out of line. Most of you appreciate the fact that you need better machines, but unless you can show an appreciable saving over a short period of time the appropriation for new machines is not readily forthcoming. An approach to this perplexing problem for shop supervisors is to develop the unit costs on modern machines as against obsolete units now used and to present to management a statement of savings possible with modern machines and modern cutting tools.

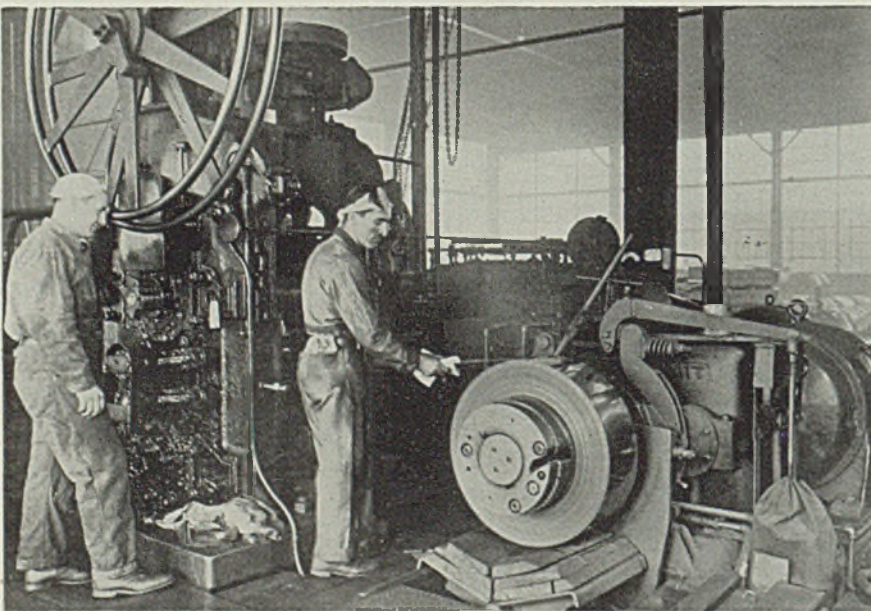
This is the line we are pursuing at the present time to convince management that investment in modern tools is the road to lower costs and better shops.

There is one thing not discussed in Mr. Moxley's address that I believe should be part of every maintenance shop. It is not the machines, but the system by which work is scheduled to the various machines.

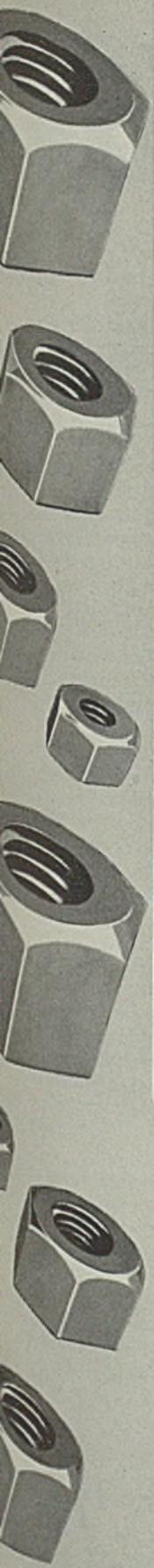
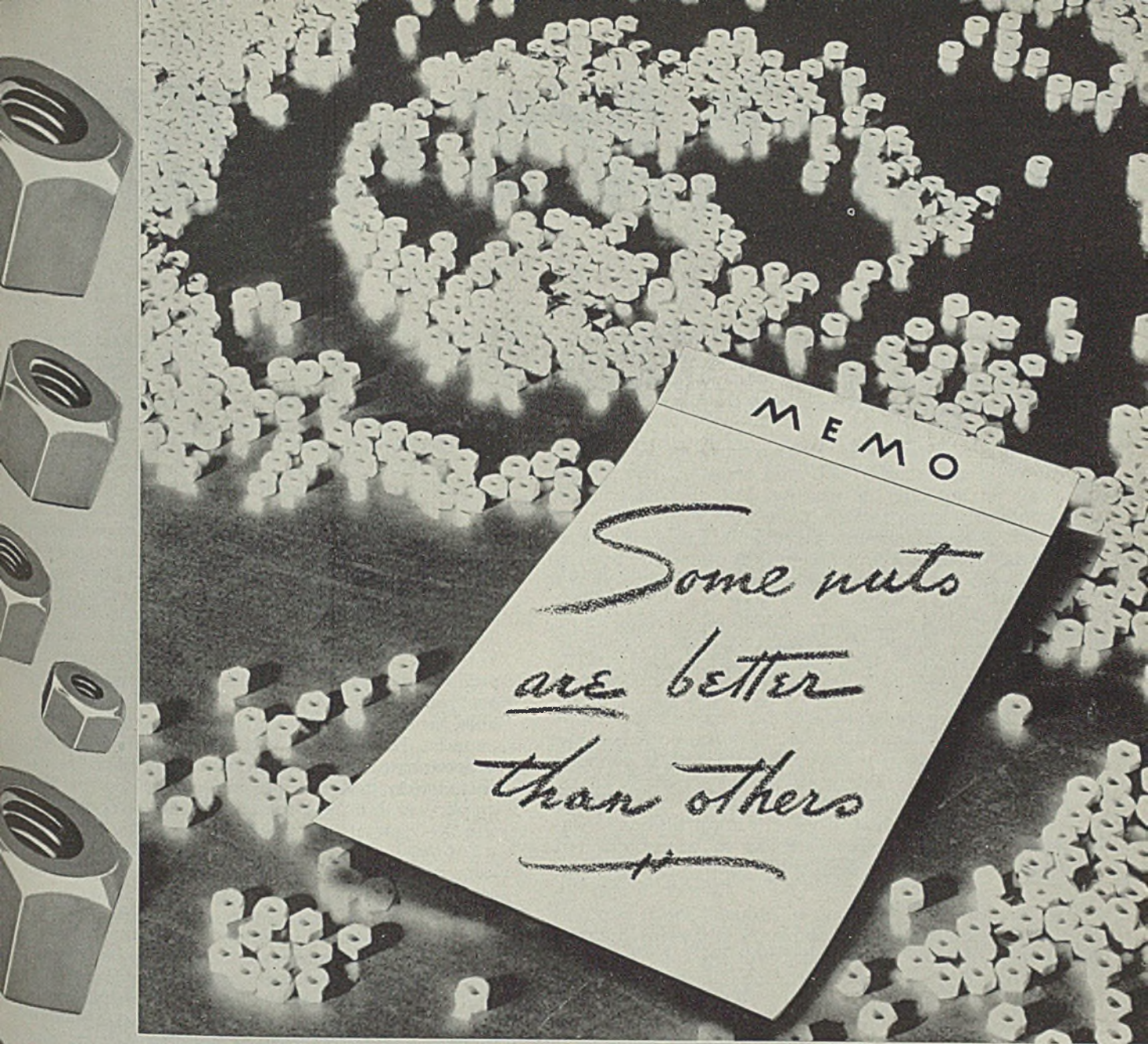
In a large shop it is important to schedule all work so that the job units reach the assembly floor in time to meet a predetermined schedule. Large numbers of orders released without careful consideration as to availability of machine time in the several groups will develop overloading, which, in turn, cause delays to schedules and a surplus of partly finished orders awaiting assembly.

In the smaller shops the foreman will probably do his own scheduling, but in the large shops this would occupy too much of the foreman's time and should be the function of a scheduling department, whose duties are to properly route and schedule the work in relation to the availability of machine groups.

Takes Strip Steel "on the Fly"



■ Capable of handling 0.015 to 0.220 gage, 18-inch strip steel coming from the mill at speeds up to 452 feet per minute, this Broden tension reel is now in operation at Bopp Steel Co.'s plant in Detroit. The strip enters the slot in the block, is gripped and the block simultaneously accelerated. A tight coil is formed in three to four turns. Strip tension can be maintained constant at any value between 600 and 3000 pounds regardless of strip speed. Photo courtesy Reliance Electric & Engineering Co., 1088 Ivanhoe road, Cleveland



FOR proof that some nuts are better than others, no more outstanding example could be chosen than EMPIRE Cold Punched Nuts.

Because of the demands of American industry for a truly superior product, RB&W built at Coraopolis, Pa., the largest and most modern nut manufacturing plant in the world, and the only plant in the United States devoted exclusively to the manufacture of nuts. Here all administrative and production facilities are concentrated on a single product—special machinery, neither duplicated nor equalled elsewhere, has been developed only for making that product—every energy is focused on the manufacture of better nuts!

In the manufacture of EMPIRE Cold Punched Nuts, punching is done at right angles to the flow lines of the steel, eliminating danger of stripping or splitting. Then the nuts are re-punched, an exclusive RB&W operation that accurately centers and finishes the hole. A burrishing operation, originated by RB&W, gives "semi-finished" nuts a flawless plate-like finish. Tapping by a principle developed at RB&W produces precise accuracy and cleanness of thread. A remarkable intra-plant transportation system governs all these processes through to the final operation of dating each keg the moment it is packed, insuring rapid, accurate delivery to the buyer of a nut that *is* better.



RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY

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

Here's What They

"... the 1940 Yearbook of Industry issue is a fine job, both in its editorial contents and its advertising pages. It should be an invaluable reference to the industry for some time to come."

"... I have just been looking through your January 1st issue of STEEL and want to compliment you on not only its makeup but also its editorial contents. I can realize, more than ever before, the truth of the statements of your field representatives to the effect that your Annual Issue is kept through the year as a buyer's reference."

"... I looked it over very thoroughly as have all the other executives of our company. You are to be congratulated on this very excellent number."

"... I am quite confident that any manufacturer would like to keep this as a reference book because of the interesting technical information it contains. The book was widely circulated in our own organization and favorably commented upon. From an advertising point of view it is an attractive buy and an issue in which we like to be represented. Congratulations on a splendid job."

"... your 1940 Yearbook of Industry issue certainly covers the field. It has plenty of useful information in it and undoubtedly will be kept by many for information purposes during the year."

"... in my estimation it is really the highspot of a year's consistently fine editorial service."

"... I have thoroughly examined the January 1st issue of STEEL and apparently several other citizens throughout the country have done so because we have received a few inquiries from our ad, which, incidentally, was swell. I would suggest that you furnish a good-sized nail with your next Yearbook so that your recipients can firmly secure it to their desks, as I have had to run this one down about sixteen different times in order to have it in my desk for reference from time to time."

"... will be retained and used throughout the year by a large majority of your subscribers."

"... it is truly a yearbook of the industry and well repays a careful study because it outlines to anyone the current state of the art, the prospects for the coming year and, through the medium of the advertising, brings together in one issue the news of what manufacturers are offering industry in the way of improved equipment. I like particularly the careful way in which this issue is departmentalized, which makes it easy to use during the remainder of the year as a reference medium."

"... we wish to offer our congratulations on your very fine achievement in publishing the recent annual issue. To us the outstanding feature was the care that had been given to make readily available the remarkable amount of information it contained. The very fine editorial arrangement was supplemented by a good index, and of no less importance is the arrangement worked out by your bindery so that the book can readily be opened and will lie open at any point."

"... we feel that your Yearbook issue gets better each year."

"... we are pleased to extend to you our congratulations for the advancement shown in the last Annual Review Issue compared to previous issues. While you have not had to apologize for any of the previous issues, at the same time, it is pleasing to note from year to year, the issues improve in appearance and interest."

"... I want to congratulate you not only on the appearance and the typography but also on the character of the articles you had in the last issue. It was a splendid piece of work from every standpoint."

"... it seems to grow better each year and is an accomplishment in which we feel you can take just pride."

... **STEEL's** January 6, 1941 Yearbook of Industry Issue will offer even greater values to the reader . . . advertising values in this issue are the best yet.

Said in 1940.....

"...what I noticed more than anything else was the fact that I didn't locate a single second rate ad in the whole issue. A few outstanding ads can usually be seen in any good trade publication, but 402 pages, each and every page well above average, plus the outstanding pages is an accomplishment."

"...I looked through your Yearbook issue very carefully and want to compliment you on it. It is hard for anyone who is not a publisher to appreciate the details and extreme care exercised in its preparation. But, in the finished book we can easily see that there has been very commendable work done."

"...I was impressed with the fact that this issue is, in truth, a real reference book of industry, and that the editorial content was such that it would be referred to many times by individuals and companies. I was impressed with the orderly presentation of the amount of material, and the comprehensiveness of the undertaking."

"...it is very evident that a comprehensive view of all phases of the industry it serves is represented on its pages and in a manner that makes it usable and at the same time attractive."

"...we enjoyed your Yearbook very much and we believe that it is a very profitable one not only for the readers but for the advertisers. We have received some favorable comment on our advertisement and trust that it will do us a lot of good."

"...on the day of the arrival of the annual issue of STEEL, the 'Yearbook of Industry' issue, I went through it quite carefully and want to say that I think an excellent job was done in presenting a comprehensive review of the year's developments in industry. I want to compliment you particularly on the extensive index which was included and which made it so easy to find subjects of special interest to the reader."

"... your 1940 Yearbook of Industry was a real surprise and we believe it outdoes anything you have previously published. We believe the manner in which you departmentized this edition has proven of real assistance to your readers. This edition is evidence of the big lift you have given your publication during the past ten years. Congratulations!"

"...we wish to advise that the January issue of STEEL, your 1940 edition Yearbook of Industry, was received several weeks ago and we wish to assure you that it is a very interesting number and has a number of fine items. This issue will be passed along to a number of different departments which I know each and every one will enjoy, as some of the departments have already been looking forward to receiving this copy."

"...my general impression of your Yearbook issue was in its favor and it might interest you to know that STEEL is as well received in this office by the people who read it as any magazine that comes to us. Several of our men have at different times made enthusiastic comments, particularly on the editorial content of STEEL."

"...extreme interest has been taken in reading the various editorial comments and descriptive articles in your Yearbook issue and wish to compliment you on the excellent character and composition of the issue."

"...regarding the Yearbook, I thought this was the finest issue of any trade publication I had ever seen. It was excellent both editorially and typographically and we were well pleased with the position and appearance of our full page advertisement."

"... the 1940 Yearbook of Industry issue is a splendid piece of work and certainly will demand a wealth of attention from the readers of STEEL. I am very sincere in this expression."

STEEL

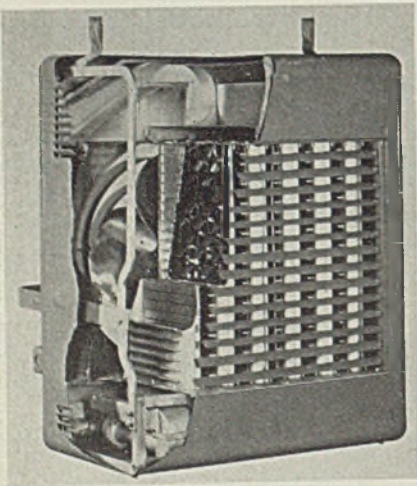
A Penton Publication

CLEVELAND



Gas-Fired Unit Heaters

■ Surface Combustion Corp., Toledo, O., has placed on the market a new line of Janitrol gas-fired unit heaters. Self-contained, the line includes the propellor fan type in capacities from 50,000 to 225,000 B.t.u.'s—the blower type with centrifugal fan in capacities from 75,000 to 450,000 B.t.u.'s—the floor

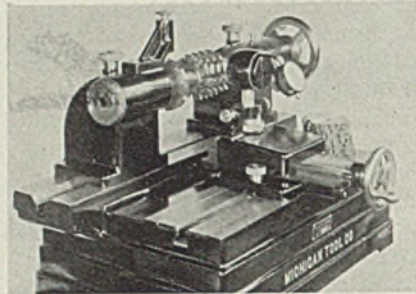


type in capacities of 60,000 to 1,250,000 B.t.u.'s and the duct type in capacities of 65,000 to 225,000 B.t.u.'s. The units operate automatically and may be controlled by separate thermostats or operated in multiple. Features included in the new design are the Multi-Thermex heat exchanger and the Amplifire burners. Installation is merely a matter of suspending the unit from the ceiling and making the gas and electric connections. No water or steam is used.

Hob-Checking Fixture

■ Michigan Tool Co., 7171 East McNicholas road, Detroit, announces a new hob-checking fixture for routine checking of hobs after sharpening. It will check for radial sharpening, spacing of flutes and runout of hubs. It also can be used for checking single form relieved cutters or form gashing cutters for

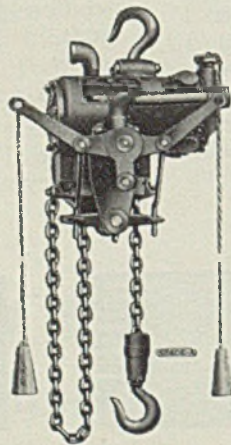
sharpening and spacing. The fixture has a maximum capacity of 12-inch diameter and 15 inches between center. Its dial indicator can be moved in both horizontal and vertical planes, while the head carrying the indicator can be moved parallel to the centers for checking at either end of a long hob. The up and down movement of the indicator is accomplished by a micrometer barrel having a graduated dial. Inaccuracies in readings are avoided



by mounting the index plate on the arbor, permitting making the centers solid. The paul which engages the index plate is mounted on the headstock of the fixture in such a position as to prevent chance of loosening in its seat. Overall dimensions of the fixture are 38 x 25 x 20 inches. Furnished with each fixture are an index plate, a 1 1/4 x 6-inch arbor and one indicator.

Air-Bloc Hoist

■ Ingersoll-Rand Co., Phillipsburg, N. J., has introduced a flexible, welded, link-chain Air-Bloc hoist for use in machine shops, assembly lines, maintenance shops, shipping and receiving departments in handling of light loads up to 700 pounds. Available in three sizes identified as LC-3, LC-5 and LC-7,

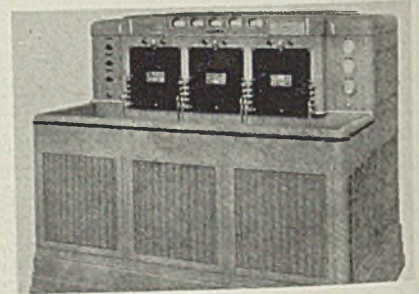


it weighs less than 75 pounds and can easily be moved from one job to another. An automatic up and down stop control prevents damage

to the hoist from overrun of chain in either direction. Another safety feature prevents the load from dropping even if the air supply fails. The hoist is powered by a 4-cylinder, radial-type air motor. The throttle control permits easy and accurate spotting.

Hardening Machine

■ Ohio Crankshaft Co., 6600 Clement avenue, Cleveland, announces a new type MG 10 Tocco Junior machine for localized surface hardening of small parts. It also can be used for brazing, soldering, annealing, heating for forming and other similar purposes. Combining preset full automatic timing controls—specially designed water cooled transformers and easily changed fixtures, this machine is compactly built. It is available in five models ranging from 10 to 80 kilowatt output. Each machine has



one to three hardening stations. Inductors are bolted to standardized attachment flanges centered in the transformer panels. Quench and cooling hose lines lead from connections flanking the station panels. Stations may be equipped with automatic feeding and handling devices and can be set up for either intermittent or continuous hardening. The entire machine including the motor generator is mounted on a rigid cast iron base. The motor generator has been designed for use within the new Junior and embodies all features of the larger generators. It supplies 9600 cycles of high frequency current at 220 to 440 volts.

Machinists' Tools

■ George Scherr Co. Inc., 128 Lafayette street, New York, announces a line of GS machinists' tools which consist of machinists combination sets with drop forged hardened square heads, hardened center head, hardened blade and reversible protractor head; a machinists' combination set with hardened blade and center head, protractor and square head of cast iron 4, 6 and 8-inch dividers; 4, 6 and 8-inch inside and outside spring calipers; hardened and tempered center gages; thick-

STEEL

EVERDUR

THE TEN-POINT METAL OF A THOUSAND USES

A TIN-FREE, HIGH-STRENGTH, COPPER-SILICON ALLOY

With an Outstanding Record of Dependable Performance

Here is a metal that represents true economy. Moderate in price, readily adaptable to a vast number of industrial needs, Everdur is a decidedly economical metal to use. Because of this, it has won an enviable position in practically every field of engineering and manufacture.

- Everdur was developed for engineering uses requiring a metal with a tensile strength comparable to that of steel, and the corrosion resistance of copper.
- It is a strong, tough, workable and durable metal and can be cast, machined, drawn, rolled, spun, stamped and forged.
- Its high endurance limit makes it exceptionally valuable for many applications involving excessive vibration.
- Strong, tough, dense welds can be made readily by the usual welding methods—oxy-acetylene torch, carbon or metallic arc, or resistance welding.
- For screw machine and turret lathe production, free-cutting rods in conventional shapes are available from stock.
- Tin-free, high-strength castings can be made from Everdur Ingots with regular brass and bronze foundry equipment.
- Its non-magnetic property overcomes the handicaps imposed by stray magnetic fields in the manufacture of some types of electrical equipment.
- Everdur holds a fifteen-year record of dependable performance on tasks where other metals failed in a relatively short period.
- This non-rust, trade-marked, Anaconda Alloy is produced in four standard compositions, and in all standard commercial forms.
- Considering its many desirable properties, Everdur has rightfully been called a "Premium Metal at a Moderate Price".

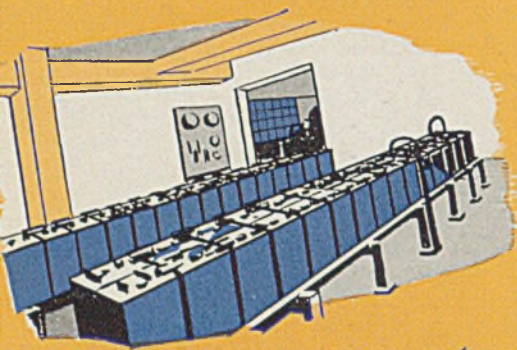


Review the partial list of its applications on the following pages, then let our Technical Department help you to determine where Everdur can do a better, more dependable job—for less money in the long run.

Anaconda Copper & Copper Alloys

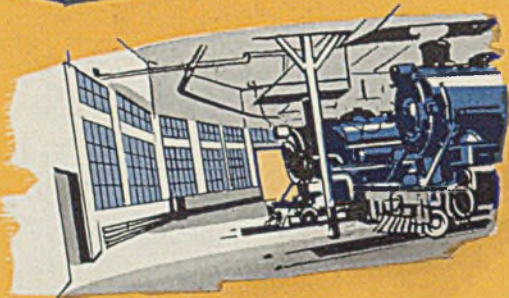
Everdur Metal

has what it Takes to resist
corrosive liquids, gases and vapors

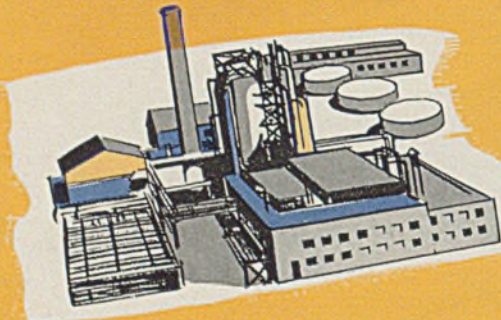


Do these successful uses of Everdur suggest a possible solution to some intricate or troublesome metal problem in your plant?

BATTERY AND PLATING ROOMS
—PICKLING EQUIPMENT
Ducts, electrical conduit, baskets, bolts, drains, dryers, sludge lines, tumbling barrels, wire brushes.



RAILWAY EQUIPMENT
—LOCOMOTIVE ROUNDHOUSES
Air conditioning and signal equipment, water tanks, ice bunkers, hardware, electrical conduit, welding rods.



OIL FIELDS AND REFINERIES
Chain, bolts, cable, agitator tanks, condenser and heat exchanger tubes and plates, conduit, sludge lines.



BRIDGES—ENGINEERING STRUCTURES
Bridge plates, bolts, tie rods, rivets, electrical conduit, castings, angles, channels, framing members, shafting.

Everdur is a trade-mark of The American Brass Company Reg. in the U.S. Pat. Off.

* **EVERDUR METAL** is produced solely by
THE AMERICAN BRASS COMPANY

MARINE FIELD—DOCKS—SHIPYARDS

Fuel tanks, marine hardware, wood and lag screws, bolts, and other forged, cast or machined fittings.

SEWAGE TREATMENT PLANTS—WATER WORKS

Screens, gates, baffles, fittings, weirs, filters, frames, tanks, bars, anchors, valve stems, bolts, man-hole steps.

BREWERIES—DISTILLERIES—DAIRIES

Kettles, vats, filters, screens, hop strainers, wort pans, process tanks, electrical conduit.

PULP AND PAPER MILLS

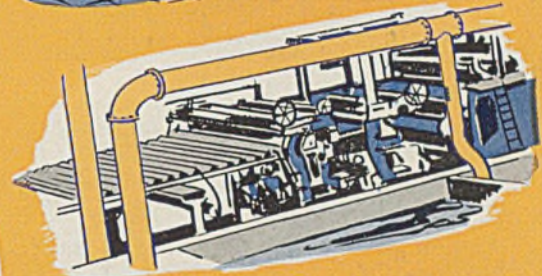
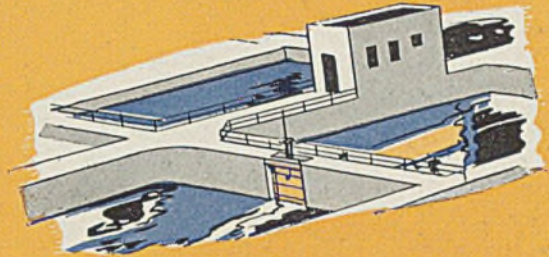
Carrying lines, fabricated and welded fittings, pulp knotters, screens, doctor blades, save-all pans, electrical conduit.

ELECTRICAL EQUIPMENT—POLE LINE HARDWARE

Circuit breakers, screws, bolts, nuts, washers, rivets, studs, clamps, springs, sockets, U bolts, eye bolts, turn-buckles, and many other accessories.

CHEMICAL AND PROCESS INDUSTRIES

Pipe lines, kettles, stills, welded fittings, valves, unfired pressure vessels, pumps, storage tanks, electrical conduit, evaporators.



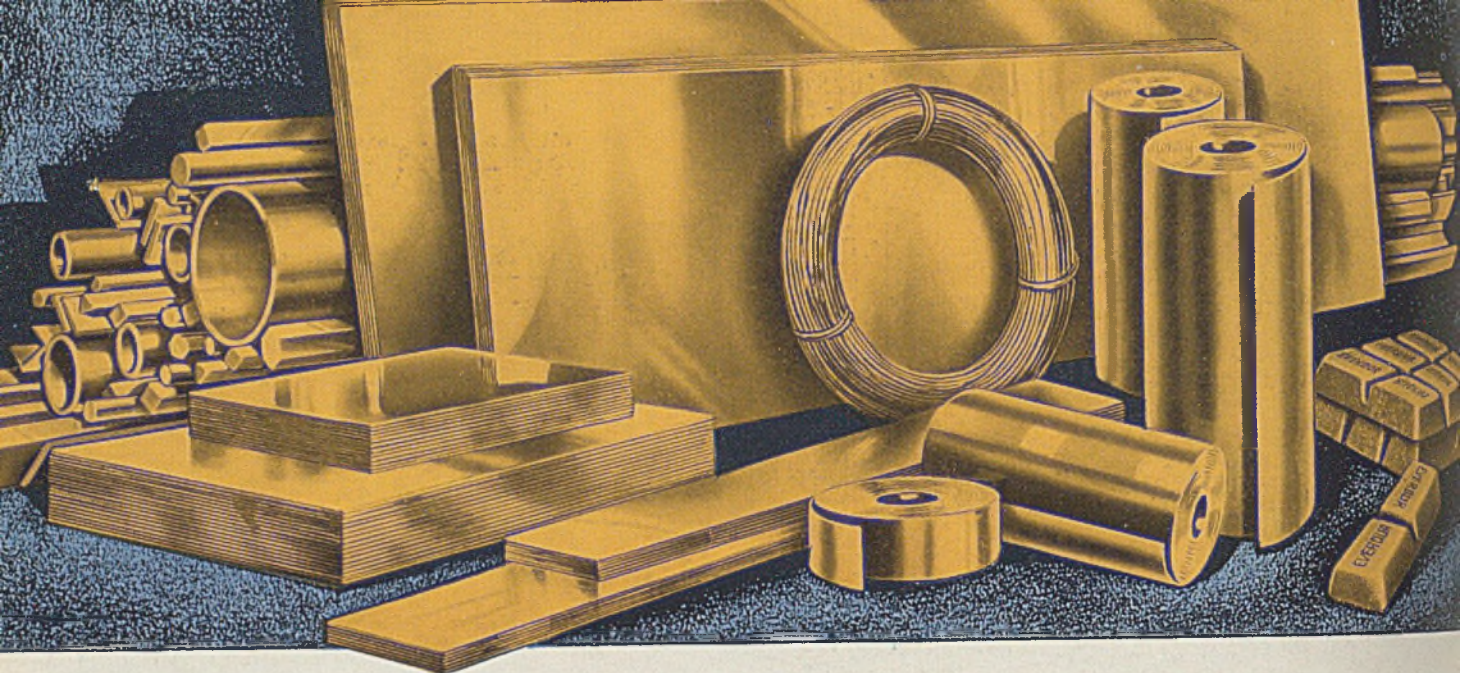
Send for these Anaconda Publications



For additional information on Everdur Metal write for any or all of these booklets. They are available without cost. Address:

The American Brass Company,
General Offices, Waterbury, Conn.

- E-5 Applications, Physical Properties and Constants
- E-1 Casting Ingots—Foundry Practice and Procedures
- B-22 Anaconda Electrical Conduit
- E-9 Fabricated and Welded Fittings
- E-6 Bolts, Screws and Accessories
- B-31 Anaconda Metals in the Aircraft Industry



All these commercial forms—and more make possible economical assembly of ALL-EVERDUR engineering structures

Everdur Metal is produced by The American Brass Company in the form of Sheets, Strips, Plates, Wire, Rods, Bars, Shafts, Tubes, Shells, Pipe, Hot Pressed Parts, Drawn Shapes, Angles and Channels, Casting Ingots and Special Products. It is also fabricated into many finished forms which can be obtained from leading manufacturers.

Everdur Metal is regularly furnished in these four principal compositions.

| | Copper % | Silicon % | Manganese % | Lead % |
|---------------|-------------|--------------|----------------|-----------|
| Everdur 1010 | 95.80 | 3.10 | 1.10 | .. |
| Everdur 1015 | 98.25 | 1.50 | .25 | .. |
| Everdur 1012 | 95.60 | 3.00 | 1.00 | .40 |
| Everdur 1000* | 94.90 | 4.00 | 1.10 | .. |

*Casting Ingots Only.

...and a Special Service

Service Engineers of The American Brass Company are prepared to cooperate in the solution of special metal problems. Their practical experience in many branches of the metal industry frequently enables them to determine the one best metal for a specific

application, and the correct procedure for its fabrication. Your inquiries will receive the close attention of trained, experienced production and technical staffs. This service is maintained for your convenience and its use entails no obligation.



THE AMERICAN BRASS COMPANY

General Offices: Waterbury, Connecticut • Subsidiary of Anaconda Copper Mining Company

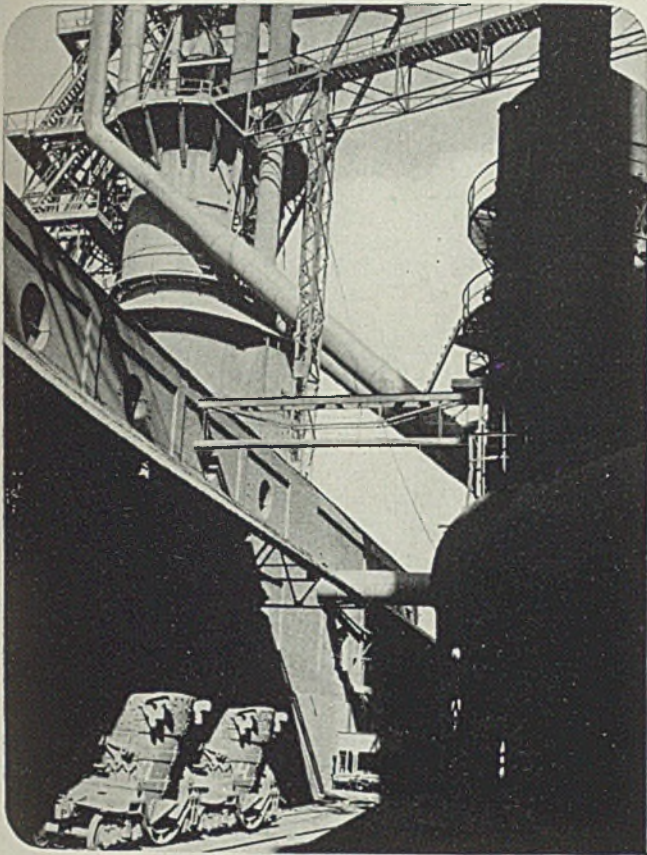
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 OFFICES AND AGENCIES—Atlanta, Ga. • Boston, Mass. • Buffalo, N. Y. • Chicago, Ill. • Cincinnati, Ohio • Cleveland, Ohio • Denver, Colo.
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IN CANADA: Anaconda American Brass Limited. Manufacturing Plant and General Office, New Toronto, Ontario
 Montreal Office: 939 Dominion Square Building

DM 4029

Anaconda Copper & Copper Alloys



HEAVY MEDIUM OR LIGHT

One factor in every branch of the Metal-Working Industry—heavy, medium, or light manufacturing or fabricating—is the availability of a dependable and suitable labor supply. Illinois is the second largest metal-working State in the Nation, with more than 300,000 workmen skilled in every phase of the Industry. Two thousand, three hundred plants turn out over \$3,000,000,000 worth of products annually—14% of the national output. All types of metal products, from the smallest to the largest, from the most simple to the most intricate, are made here.

The steady growth of the Metal-Working Industry in Illinois has created a desirable labor situation. Skilled workmen gravitate to localities where their qualifications and experience will assure steady employment. Illinois has achieved its dominant position in the Metal-Working Industry because of the following combination of advantages offered manufacturers and fabricators of metal products. PROXIMITY TO THE NATION'S ORE-PRODUCING CENTER—EXCELLENT RAIL, HIGHWAY, AND WATER TRANSPORTATION TO THE MARKETS OF THE NATION AND THE WORLD—THE HUGE MIDDLE WEST MARKET WITHIN OVERNIGHT SHIPPING RADIUS—LOW COST FUEL—ABUNDANT POWER.

Investigate the Industrial Advantages of Illinois

Write the Illinois Development Council at Springfield for a special report containing complete details of the factors in the profitable operation of a metal-working plant which are available in Illinois.

**ILLINOIS DEVELOPMENT COUNCIL
STATE HOUSE • SPRINGFIELD, ILLINOIS**

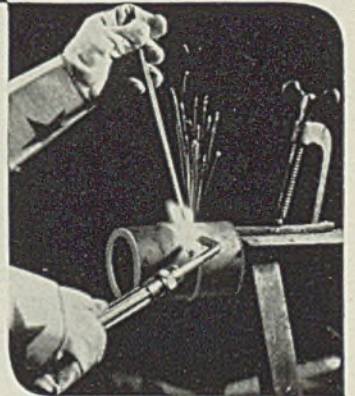


AN ABUNDANCE OF SKILLED WORKMEN

The diversification which characterizes the Metal-Working Industry in Illinois has provided thousands of workers with training and experience in every phase of the production and fabrication of metals. This is an important factor in efficient operations, particularly in this Industry which is facing the problem of meeting "stepped-up" production schedules necessitated by the constantly increasing demands for industrial and defense materials.

TRAINED FOR INDUSTRY

In the educational system of Illinois, vocational training is an important function. Each year, constantly increasing numbers of young men are entering industry with a background of basic training which equips them to fit into the skilled labor needs of the Metal-Working Industries. The continuance of an ample reserve of skilled labor, which is a vital consideration in plans involving future expansion, is assured for industries located in Illinois.



ILLINOIS

THE STATE OF BALANCED ADVANTAGES

ness gages; depth gages; surface gages; magnifiers. Hook, sliding caliper, flexible and narrow tempered rules also are included in this line.

Roller Chain

■ Diamond Chain & Mfg. Co., Indianapolis, has placed on the market a new No. 88 eight-millimeter chain for service where other roller chains are too heavy or bulky. In spite of its minute dimensions, 0.315-inch pitch, with rollers 0.197-inch diameter by 0.125-inch width, the chain is made to the same standards

as larger chains. The 192 individual parts in each foot of chain are assembled to a total length tolerance of only plus 0.0156-inch minus 0.000. It is equally practical for dependable power transmission at extremely high speeds, and for applications for which maximum compactness without sacrifice of enduring accuracy is essential.

Index Centers

■ Hardinge Brothers Inc., Elmira, N. Y., announce new index centers incorporating features to speed up production in the milling of pre-

cision parts. The accompanying illustration shows the construction of one of these units. The box-like construction minimizes overall height to act as a base for the spindle section. The spindle section swings through an arc of 220 degrees and is graduated in degrees for settings from 10 degrees below horizontal to 20 degrees beyond vertical. A vernier in minutes is incorporated for fine settings. The 2-piece draw spindle is ground to take collets which have a range by fractions from 1/16 to 1 inch round, 3/8-inch hexagon or 23/32-inch square. Precision hardened spiral bevel gears and a nitrided spiral bevel pinion provide a 4 to 1 ratio between the spindle and the index plate crank. Four index plates are furnished, together with a chart listing all divisions obtainable from 2 to 360. The index plate mounting is independent of the gearing with the spindle and crank, being engaged between the two by the clamp on the outer periphery of the index plate. Antifriction bearings provide support for all gears and shafts. The spindle section has large swivel bearings and locks to secure angular settings. The index head is arranged for right hand mounting. Its keys fitting the table are removable. The base of the head has a cross key way to permit placing

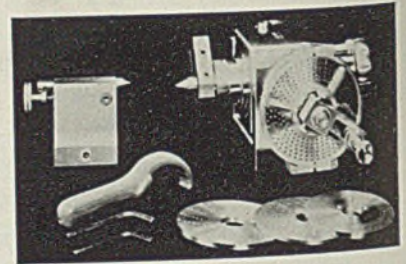
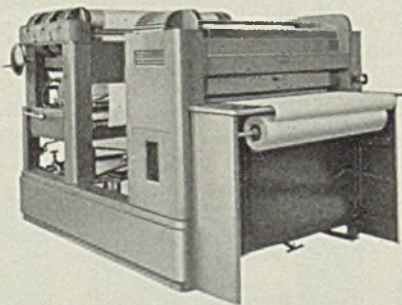
Teamwork..

IN NATIONAL DEFENSE
IS COORDINATED BY
BLUEPRINTS

When unusual demands are put upon many industries working toward a common goal, each one has to gear its production to the next. There can be no weak links or the finished product will be delayed.

Now, in this National emergency, with so many specialized products on order, there are thousands of new designs and redesigns which must be drawn out in the drafting room and transmitted to the shop. Blueprints are the simplest and most satisfactory method of reproducing these engineering drawings.

The C. F. Pease Company—for 30 years the leader in the Blueprinting Industry—has upped its production of Quality Blueprinting Machines by operating night shifts in its new, modern plant. Additional space is being planned and new improvements are constantly being built into every machine, in an effort to strengthen the reproduction link in the Defense Program. The Pease Company is proud to be a part of the great National plan to maintain Peace, and toward this end will continue to furnish the finest Blueprinting Equipment available.



the spindle parallel to the milling machine cutter spindle. Both index head and tailstock have a combined length of 14 3/4 inches. A similar index head also is offered for spiral milling. This incorporates all features of the plain index head and is furnished with a chart covering all leads from 0.600 to 42.656 inches.

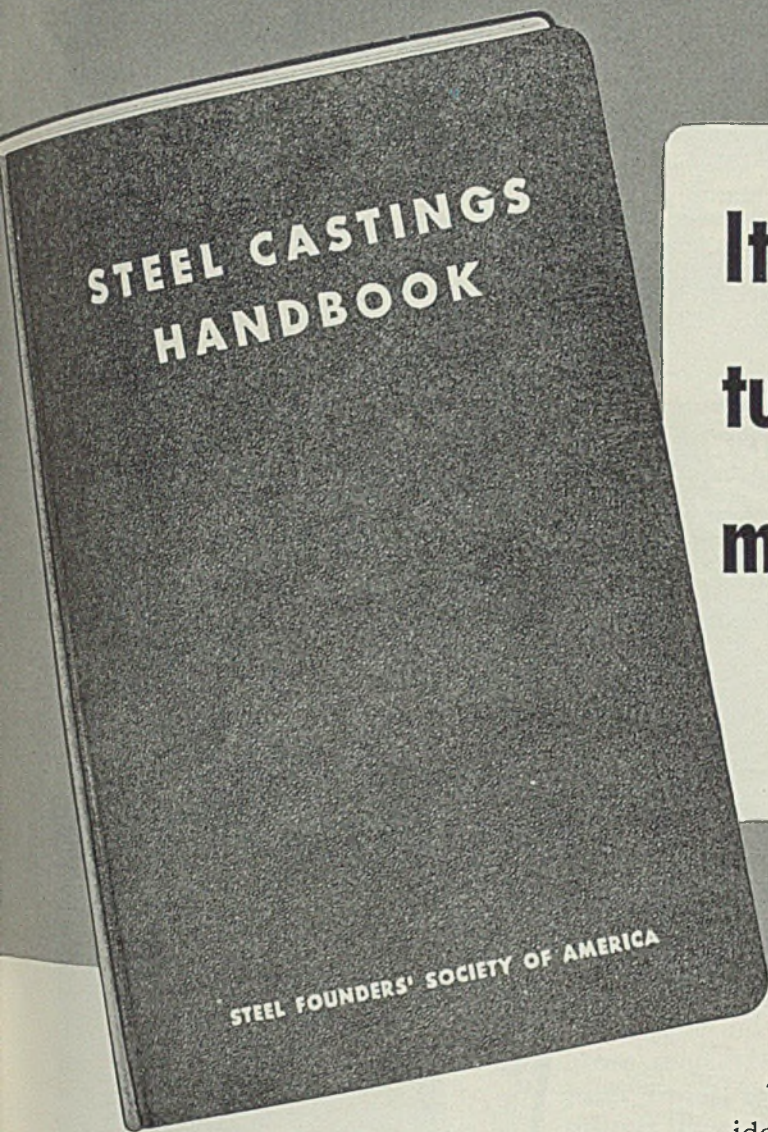
Voltage Regulator

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has placed on the market a new quick-acting rheostatic regulator for small alternating and direct-current generators. Known as the Silverstat Junior, it is available in direct current ratings up to 25 kilowatts and alternating current ratings up to 44 kilovolt-amperes. The voltage of the machine to be regulated is connected across the regulator coil, and any change in voltage results in a corresponding change in the magnetizing effect of the coil on

THE C. F. PEASE COMPANY

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SEND FOR THIS **NEW** BOOK



**It will help you
turn out a better,
more modern
product**

The new Steel Castings Handbook, just off the press, summarizes the experiences of hundreds of engineers, designers, metallurgists and steel foundrymen. It is the most complete handbook on Steel Castings ever compiled—conveniently arranged for quick reference—well illustrated, attractively printed and durably bound.

The book contains over 500 pages of facts, ideas, tables, charts and illustrations—all designed to help you manufacture a better and more modern product, often at a substantial cost saving. It should be on your desk or in your library right now.

Ask your foundryman to show you the New Steel Castings Handbook, and tell you how to secure your personal copy. The book is valued at \$2.00 per copy, postpaid, and the supply is limited. Steel Founders' Society of America, 920 Midland Bldg., Cleveland, Ohio.

MODERNIZE YOUR PRODUCT WITH

STEEL CASTINGS

the magnetic circuit. The attractive force on an armature will be increased or decreased causing the armature to seek a new position. This will either close or open, in sequence, an assembly of silver buttons to short out or insert steps of a carbon-plate resistor in series with the field circuit of the generator. Nonoxidizing silver buttons assure clean contacts.

Spray Gun

■ O. Hommel Co., 209 Fourth avenue, Pittsburgh, announces a new model Kingbee spray gun for spray-

ing wide surfaces. It features a finer atomization, speedier distribution of material, is very easily cleaned, will not clog, is sturdily constructed and will resist a great deal of wear.

Angle Plate

■ Wesson Co., 1050 Mt. Elliott avenue, Detroit, has introduced a new machine tool fixture for increasing the range of work done on drill presses, grinders and milling machines. Called the Wesson Universal angle plate, it is fitted with a slotted top plate. The plate may be

adjusted in three planes—each completely graduated. With this device, parts which are too large or of too irregular shape to be conveniently held in a vise can be clamped by means of T-slots in the top plate.

Tapping Machine

■ Cleveland Tapping Machine Co., 1725 Superior avenue, Cleveland, has placed on the market a B-2 vertical tapping machine which incorporates the clutch mounted on the drive shaft, leaving the tapping spindle free. This arrangement makes it possible to tap $\frac{1}{2}$ -13P, in boiler plate at 360 revolutions per minute. Clutch adjustment is so sensitive that the pressure on it, the speed, and tap can be changed in 90 seconds. The table of the machine measures 12 x 16 inches and is equipped with a large oil trough. It may be easily adjusted for height, by rack and gear and swings horizontal. It also has a vertical movement of 34 inches. Because the clutch is not mounted on the tapping spindle, the rigidity of the latter can be controlled. The spindle revolves on ball bearings with-

YOU GET THE SHORTEST RUNS in the LONG RUN
by Speed Cleaning
and FINISHING METALS with the AIRLESS WHEELABRATOR



For speed cleaning the WHEELABRATOR has no equal. At least 90% of the work being cleaned in this equipment is handled in from 5 to 15 minutes—and this includes products that ordinarily require 2 to 5 times as long to clean by other methods.

The principal factor in WHEELABRATOR'S incomparable performance is the airless WHEELABRATOR blasting unit. This unit throws more abrasive per minute with less horsepower (300 lbs. per minute using a 15 HP motor) and throws it harder than any other blasting system ever devised—yet the finish can be perfectly controlled.

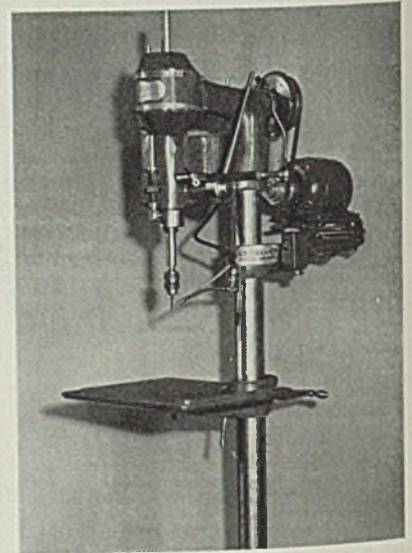
The use of steel abrasive instead of sand is another element that increases the speed and effectiveness of the WHEELABRATOR. Sand, unlike steel abrasive, breaks down rapidly and causes undue wear. Steel abrasive has an added advantage, too, in that it does double duty by rebounding from piece to piece.

The design of WHEELABRATOR equipment also accounts for its superiority in cleaning: For example, the Tumbblast conveyor which excels not only in the rapidity and completeness with which it ex-

poses the work to the blast, but also in the speed with which products can be loaded and unloaded.

The WHEELABRATOR Tabblast, used for cleaning flat or fragile pieces, gives better coverage and faster cleaning because: (1) the WHEELABRATOR unit throws abrasive in a long swath rather than in a narrow stream such as that thrown from an oscillating nozzle; (2) the span is much longer; (3) the bombardment is continual; (4) the products remain in the path of the abrasive stream the entire length of the blast zone; and (5) since the work is carried on revolving tables, the abrasive strikes every exposed surface.

With Specially Designed WHEELABRATOR Cabinets, the same quality of speed cleaning is obtained because rapid and complete exposure of the work to the blast is achieved by subjecting the work to a rolling, tipping, spinning or other motion while passing through the blast chamber.



in a 2-inch quill. Lubrication is applied directly to the tap by an oil line. Speeds may be changed as desired by changing the 4-speed pulley on the motor. The machine is powered by a $\frac{1}{2}$ -horsepower motor.

Multi-Versal Machine

■ Hack Machine Co., 440 North Oakley boulevard, Chicago, has introduced a new Multi-Versal machine designed to perform as a multipurpose machine tool, and to make possible the practical application of the machine to both reciprocating and rotary cutting. Built-in features consisting of the



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 FOUNDRY EQUIPMENT CO.
 509 S. BYRKIT ST. MISHAWAKA, IND.

OFFICES IN PRINCIPAL CITIES . . . CABLE ADDRESS: AFECO

WORLD'S LARGEST FENCE ORDER

...and it's all Pittsburgh!



ENGINEERING FACTS

Approximate combined length
of Fence 330 miles
Weight of Wire Fabric 995 tons
Weight of Zinc Coating
on Fabric 65 tons
Weight of Posts, Gates,
Fittings, etc. 705 tons
Weight of Zinc Coating on Posts,
Gates, Fittings, etc. 63 tons
Total weight of complete
Fence installation 1,700 tons

More than 320 miles of bright, husky *Pittsburgh* Welded Joint Fence, and 8 miles of *Pittsburgh* Chain Link Fence, protect the *entire* right-of-way and interchanges of the famous Pennsylvania Turnpike. Yes, it's the largest single order of fence ever sold! More important, it typifies the high regard of responsible authorities for the superior qualities of *Pittsburgh*—the only fence sold under a manufacturer's Certificate of Specified Quality! *Pittsburgh's* Fence line includes Farm and Poultry Fence in hinge-joint, welded-joint and lock-joint types; Industrial Fences; Close-mesh Welded Fence Fabrics; and superb designs of Lawn Fence. All are of special analysis copper bearing steel, heavily coated with pure, ductile, non-cracking zinc for longest life. Whether for protecting a highway, safeguarding an industrial plant, or fencing a farm—always specify *Pittsburgh*!

PITTSBURGH STEEL COMPANY

1643 GRANT BUILDING

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Pittsburgh Fences

HINGE JOINT • WELDED JOINT • LOCK JOINT



reciprocating ream ram, and the master head reduce the number of attachments needed, but increase applications. It features focused control, simplified operations, rapid changeover, new electric system with pushbutton controls, illuminated vernier scales, touch feed controls and high speed auxiliary head for angular work. The base carries a 2-horsepower motor which operates a worm gear drive and a bronze worm wheel fitted into a gear housing integral with the base. The worm gear, through a shaft, drives a compound eccentric and, by means of a scotch yoke, it permits adjustable vertical recipro-

cating motion to the ram, delivering ample power for heavy cutting. The Master head receives its power through a V-belt from a motor adjustably attached to it. Six back-gear speeds for driving cutters, ranging in size from a 1-inch end mill to an 8-inch face mill are provided. This master head can be elevated within the ram by means of either hand or power feed. It also serves as a carrier for all removable attachments and is fitted with a central boss about the spindle which serves to centrally locate attachments. The maximum height of the master head spindle above the table is 20 inches—the minimum

height is 6 inches. The taper hole in the spindle is fitted with sleeves to take B & S and Morse tapers and an adapter for spring collets. The exterior of this spindle is threaded, with a shoulder to take chucks. The nose of both the master head and the vertical head spindles are identical.

Air Valve

■ C. B. Hunt & Son, 1862 East Pershing street, Salem, O., announce a new double 4-way hand-operated air valve for controlling two individual double-acting air cylinders with only one valve. It has many industrial possibilities on air operated clamps, fixtures, knives or any application where it is necessary to have one point of control for two cylinders that lead and lag each other in their respective actions. The sketch illustrates a conventional hook-up of this new valve to two double-

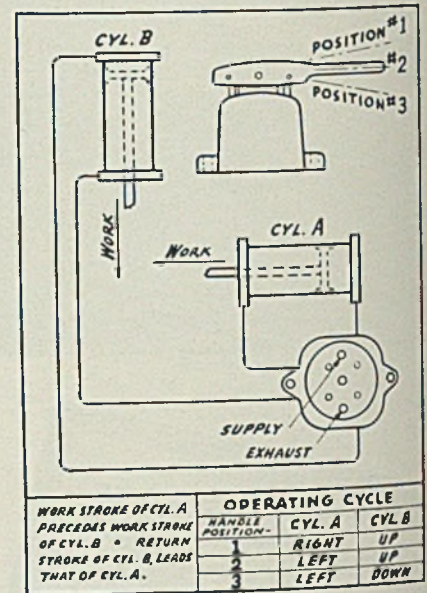
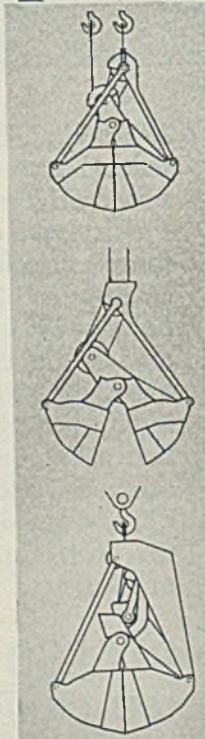


Handling FERROMANGANESE from cars to stock pile this Blaw-Knox Bucket unloads an average of 7 cars per eight hour shift. The former cost of \$.65 per ton was reduced to \$.25 per ton.

This bucket handles LIMESTONE in pieces ranging from 6" to 12" from dock to 50-60 ton gondola, filling car in an average time of 20 minutes.

It unloads SPIEGEL from 50-60 ton car in 1½ hours without teeth, and handles PIG IRON from stock pile at the rate of about ¾ Cu. Yds. per grab.

Blaw-Knox Buckets are designed to meet Steel Mill requirements—put your bucket problems up to Blaw-Knox.



acting cylinders where the work stroke of the first cylinder (A) advances before that of the second cylinder (B); and the return stroke of cylinder (B) is completed before the corresponding stroke of the first cylinder (A).

Cut-Off Machine

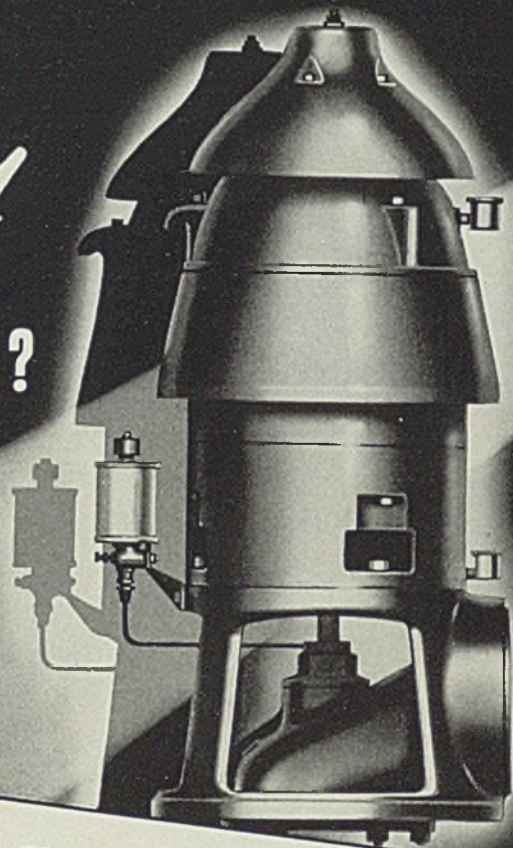
■ Quijada Tool Co., 5474 Alhambra avenue, Los Angeles, announces an abrasive cut-off machine capable of handling structural shapes, round stock and tubing up to 6 inches outside diameter. It makes straight or angle cuts at fast speeds. Shielded ball bearings are used on both the 3-horsepower and wheel spindle. The quick acting vise provides a rigid support on both sides of the cut. The machine is equipped with a variable speed pulley to keep the rim

BLAW-KNOX
Digging
and
Rehandling

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OF BLAW-KNOX CO.
Farmers Bank Bldg. • Pittsburgh, Pa.

BUCKETS

Conspiracy IN YOUR PLANT?



FAIRBANKS-MORSE TURBINE PUMPS

Complete range of capacities (35 g.p.m. to 4000 g.p.m.) for electric motor, Diesel or gasoline engine, or steam turbine drive. Open or closed impellers, oil or water lubrication. Today's 6" F-M Turbine is 23% more efficient than the same size was in 1927; today's 10" turbine is 21% more efficient than the 10" pump was in 1927!

YES, a conspiracy between a pump and the power meter!

A conspiracy that can—and DOES—go on unnoticed year after year in hundreds of plants where old pumps are imposing a 10% "penalty tax" on the operating budget? That *is* happening in your plant—if your pumps are old. Due to improved methods, improved materials, and improved design, today's Fairbanks-Morse Pumps are at least 10% more efficient than the same types were ten years ago. Thus, if your old pump is as good as new (it probably isn't), it is costing you at least 10% more to operate it than it would cost to operate a new one. *10% is a good return on any kind of investment!*

It won't cost you anything to find out how much new pumps would save you. Write Fairbanks, Morse & Co., Dept. 96, 600 S. Michigan Ave., Chicago, Ill. Branches and service stations throughout the United States and Canada.

7837-PA40.70

FAIRBANKS · MORSE PUMPS

DIESEL ENGINES ELECTRICAL MACHINERY RAILROAD EQUIPMENT WASHERS-IRONERS STOKERS
MOTORS FAIRBANKS SCALES WATER SYSTEMS FARM EQUIPMENT AIR CONDITIONERS

speed of the cutting wheel constant. This simple adjustment is made by moving a pointer until it coincides with the rim of the wheel.

Drilling Machine

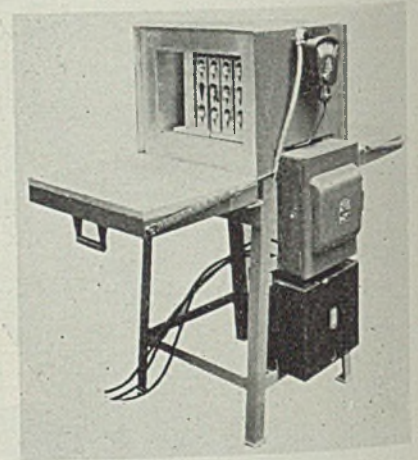
■ Hamilton Tool Co., Hamilton, O., has placed on the market a Vari-matic drilling machine which features an infinitely variable speed adjustment in two ranges of speeds. These are provided by a 2-step driving and spindle pulley. The complete speed range of the machine is 840 revolutions per minute to 9300 revolutions per minute with a con-

stant speed 1725 revolutions per minute motor providing the power. This machine also can be furnished with a higher minimum and a greater maximum speed by changing the driving pulley and belt. A graduated speed dial on the speed changing hand wheel shows the speeds at which the spindle is operating. The drilling unit is self-contained and swings radially on the column, locking to any position. All controls are manually operated. The 6½-inch vertical adjustment of the drilling unit is accomplished by an elevating screw. The base of the machine measures 15½ x 10 inches. Overhand of drilling unit from cen-

ter of chuck to column is 5 inches. The machine is powered by a ¼-horsepower 1725-revolutions per minute vertical motor.

Rivet Heater

■ American Car & Foundry Co., 30 Church street, New York, announces a Berwick electric aluminum rivet heater featuring twelve slots on each side so that 24 rivets can be heated at one time. It will handle rivets from ¼ to 1½ inches in diameter. Equipped with automatic temperature control, the heater will reach any degree of temperature between 0 and 1000 degrees. Within three minutes, 24 rivets of practically any size can be heated to 400 degrees. This heater can be used for annealing rivets, or for heating them to drive while hot. The rating of the unit is approximately 16 kilovolt amperes and it can be built for any alternating current voltage. There are two ranges of speed—high, to get the heater hot, and the other



slow, to keep it heating. The heat is generated by a number of 430-watt units. The entire oven is insulated with a 3-inch thickness of asbestos bricks or sheets. The weight of the machine is approximately 400 pounds.

Voltmeter

■ General Electric Co., Schenectady, N. Y., has introduced a new portable 15-kilovolt high-resistance voltmeter for approximate indications of voltage. It is for use on 6900 and 12,000-volt circuits. It has a scale marked 0-15 kilovolts and is constructed to withstand 30 kilovolts momentarily since this voltage may be experienced when phasing out 15-kilovolt circuits.

When used for phasing-out service, the instrument will show approximately 0 voltage if the correct phase relationship is obtained, or will go off-scale, indicating an im-

RODINE

*Makes Pickling
Efficient*

- Stops Waste of Acid and Metal.
- Prevents Over-Pickling.
- Eliminates Acid Fumes.
- Reduces Acid Brittleness.
- Cuts Costs.
- Increases Tonnage.

Bulletin on request

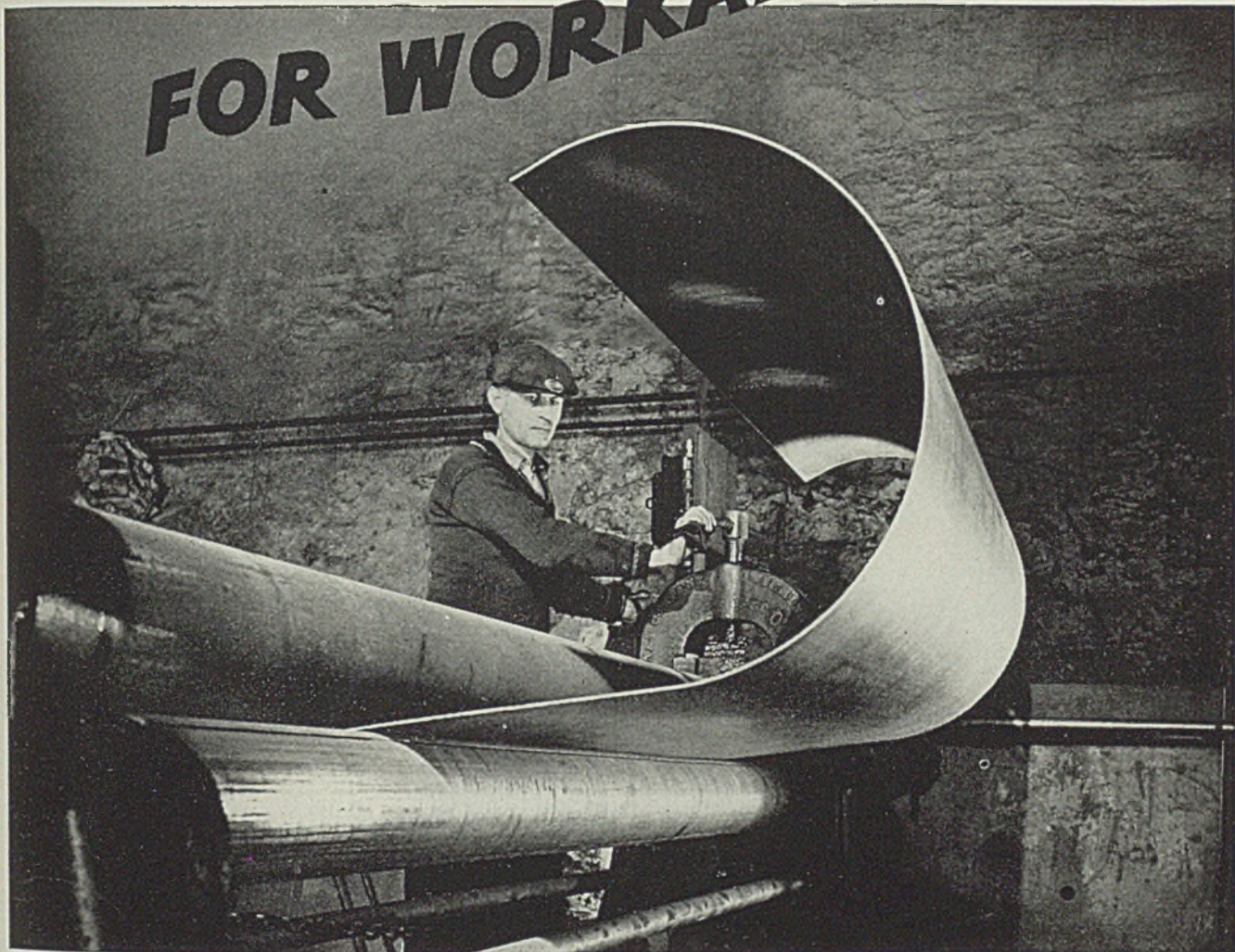


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DEPT. 310. AMBLER, PENNA.

Detroit, Mich., 6339 Palmer Ave., E.

Canadian Branch, Walkerville, Ont.

FOR WORKABILITY



BETHLEHEM HOT-ROLLED SHEETS

Primary requisite of materials to be cold-worked is the maintenance of an accurate balance of those properties that insure ease of fabrication without loss of ruggedness in the finished product.

This essential balance is a characteristic of Bethlehem Hot-Rolled Sheets. Easy-to-work in the shop, rugged and durable in service, Bethlehem Hot-Rolled Sheets are the solution to many a tough production problem.



BETHLEHEM STEEL COMPANY

proper connection. Basically, the voltmeter consists of a miniature instrument connected in series with a ¼-watt neon lamp and two high-voltage resistors, treated to maintain stability under varying atmospheric conditions. A transparent plastic tube encloses all parts. The indicating instrument used is a rectifier-type milliammeter.

Pump Head

■ Peerless Pump Co., 301 West avenue 26, Los Angeles, announces improvements in the design of geared heads for its deep well tur-

bine pumps. The take-off shaft of each pump now can carry increased loads. Double-row ball bearings support horizontal and vertical shafts, and are placed adjacent to the spiral bevel gears. An extra heavy-duty thrust bearing supports the lower end of the geared shaft sleeve, while an additional thrust bearing supports the outer end of the horizontal shaft.

All bearings are lubricated by an oil pressure system. To prevent leakage of oil from the outer bearing on the take-off shaft, an oil seal is embodied on the end of the bearing housing. The head assembly is streamlined and the gearing is com-

pletely housed. Standardized speed ratios of 1 to 1, 1 1/3 to 1, 1 1/2 to 1, and 2 to 1 are provided.

This head, known as the Gear-turbo provides for connection with a flat belt pulley, V-belt or for direct connection through a needlepoint or universal shaft to gas engines, steam engines or any other power unit.

Magnet Filter

■ S. G. Frantz Co. Inc., 161 Grand street, New York, announces a new PQ permanent magnet FerroFilter for lube oil purification. It magnetically extracts coarse and small iron particles (even as microscopically fine as 1/25,000-inch diameter) from suspension in lube oil circulating systems at no operating or maintenance cost. The filter consists of a stack of magnetized screens enclosed in a cylindrical casing through which the oil flows. These have triangular mesh openings of about 1/8-inch.

Although offering little resistance to the flow, their design presents hundreds of feet of strongly magnetized edges to the oil. These edges comb and recomb the oil. The magnetic particles are held firmly to the screen edges until the filter is cleaned. The unit is placed in the oil pipe line and becomes part of the circulating oil system.

Carbon Brush Concaver

■ Ideal Commutator Dresser Co., 5076 Park avenue, Sycamore, Ill., announces a carbon brush concaver which facilitates the forming of brushes to the commutator curvature. It is used as a templet to locate accurately the arc segment on the cutting guide slot, which arc corresponds to the contour of



AMERICAN *Radial* BEARINGS

Use them wherever the load is radial, and American Radial Bearings will return dividends on your investment . . . dividends in friction-reduction . . . dividends in length of satisfactory service.

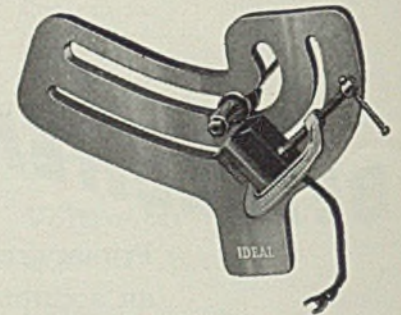
American Radial Bearings, of the grooved inner-race type, are simple in design, pre-

cise in construction. This style of bearing can be furnished in any standard S.A.E. dimension, with either the inner or outer race grooved for cage retention. Both races and rollers are made from a special, heat-treated alloy steel.

Specify American Radial Bearings next time.

AMERICAN ROLLER BEARING COMPANY, PITTSBURGH, PA.
Pacific Coast Office: 321 W. Pico St., Los Angeles

AMERICAN
Heavy-Duty ROLLER BEARINGS



the commutator or slip ring. After this segment is found the new brushes may be formed without further setup. Any electric drill or electrical shaft drive may be used to operate the cutting head. The complete unit includes aluminum guide casting, cutting file, removable angle plate with clamping device and C clamp. It takes practically any size brush for 4 to 48-inch diameter commutator.

Better Bites

(Concluded from Page 48)

milling saws usually are mounted between driving flanges of "3-dowel pin" type, as depicted in Fig. 4. This insures transmission to these cutters of the power to drive them to take the extraordinarily heavy cuts of which they are capable—such as, for instance, that of an 8-inch blade cutting through a 2 x 3-inch bar of SAE 1020 steel in 30 seconds.

An unusual thing about the new curled-chip system is that teeth of exactly the *same shape* as far as profile is concerned give equally satisfactory results regardless of whether employed on metal-cutting band saw blades of 8, 10 or 12 teeth per inch; on power hack saw blades 14 to 24 inches in length; on milling saws 6 to 16 inches in diameter; or on inserted tooth cold saws from 11 inches up to approximately 10 feet in diameter.

Stand Heavy Service

These inserted-tooth cold saws—the design of which is shown clearly in Fig. 5—are capable of the hardest kind of service in the latest types of heavy duty circular sawing machines. These segments, which are readily replaceable, have cutting edges on their teeth which are integrally fused in place—not merely welded or brazed in the old-fashioned conception of those terms. The bodies of these segments are of tough alloy steel which will not crack under conditions such as is encountered in steel mills, forging plants, shipyards, ordnance establishments, etc.

Tests conducted under practical working conditions indicate that under ordinary circumstances, the solid and segmental saws built on the curled-chip system can be operated safely at the following speeds in the materials specified in the table:

| |
|---|
| Aluminum—Up to 5000 lineal feet per minute |
| Brass, copper cast—1400 lineal feet per minute |
| Brass, drawn—1400 lineal feet per minute |
| Copper—350 lineal feet per minute |
| Bronze—350 lineal feet per minute |
| Carbon Steel—150 lineal feet per minute |
| Nickel, chrome-nickel steel — 56 lineal feet per minute |
| High speed steel—33 lineal feet per minute |
| Nonrusting steel—33 lineal feet per minute |

Of course, these figures are only approximate and in some cases the safe speed may be found through operating experience, to be somewhat higher. When it comes to recommending feeds and tooth spac-

ing, no general rules can be given. Those factors vary widely in accordance with the nature of the shapes to be cut—whether tubing, structurals, solids or billets. The experience of the saw manufacturer should be called upon in determining these factors, and initial cuts should be watched carefully to make sure that behavior is entirely satisfactory.

Rigid holding of the work is of course of tremendous importance toward enabling the saws to be pushed to their utmost capabilities with power and rigidity of sawing machines of equal importance.

Concrete Dye Now Made Alkali-Proof

■ Colorflex, a dye for concrete floors made by Flexrock Co., Dept. S, 2300 Manning street, Philadelphia, now is reported to be totally alkali proof. It is available in four colors—battleship gray, linoleum brown, tile red and emerald green. In addition to being alkali-proof, the dye has withstood tests of concentrated sulfuric acid, a 50 per cent solution of water and sulphuric acid, carbonic acid and spillage of alcohol that was ignited.

Save
Time
and
Money!


with

KINNEAR MOTOR OPERATED
STEEL ROLLING DOORS



Take any key feature of these famous doors—you'll quickly see how it boosts door efficiency! First, Kinnear Rolling Doors are more ideally suited for time-saving, step-saving Motor Operation. And take their vertical, coiling upward operation! That saves floor, wall and ceiling space, and keeps the doors out of the way of plant operations and all traffic when open. Or look at the rugged, all-steel construction! That not only assures longer wear—it also gives you protection against intrusion, riot, sabotage and theft—it defies weather, resists

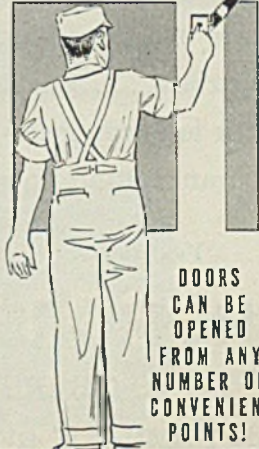
Dependable



This rugged Kinnear Motor Operator opens the doors, quickly, smoothly, easily. Built for long, care-free, economical, heavy-duty service! Easily added to any Kinnear Rolling Door—whether new or now in service.

accidental damage and repels fire. Again, there's Kinnear's positive, effective spring counterbalance—assuring smooth, easy operation! Check the other gains your plant will make with Kinnear Rolling Doors . . . write for complete catalog TODAY! The Kinnear Manufacturing Company, 1780-1800 Fields Ave., Columbus, Ohio.

Convenient



DOORS
CAN BE
OPENED
FROM ANY
NUMBER OF
CONVENIENT
POINTS!

KINNEAR
ROLLING DOORS

Stretch it . . . To Test it

(Concluded from Page 64)

on such samples on the portions between the initial strain lines, as these portions probably are elongated about 5 to 8 per cent, the elongation value selected for the test. Fig. 2 shows a sample of this.

Grading: Generally the appearance factors that have been considered when grading impact spots apply to the grading of stretch samples, with the possible example of stretcher strain on the latter. Dark test areas indicate more enamel

clinging to the metal than on light test areas. Close-packed fine particles have been taken to mean that a greater frequency of points of attachment exist than with coarse particles. In either case, all enamel except that which is close to the base metal shatters and becomes detached from the specimen, leaving small enamel particles attached to the metal surface. Grades ranging from excellent to very poor may be established. A possible system suggested for comparison is shown by the samples in Fig. 3.

To check correlation of results

obtained by stretch testing with microscopic and impact methods, a test series was run in which the enamel processings were varied. Fig. 4 represents a group showing effect of variation in the firing time from 1 to 9½ minutes at 1600 degrees Fahr. All samples were examined by impact, stretch and microscopic methods. All samples are from the same 20-gage sheet. The portions tested by impact and those microscopically examined were enameled as one piece with the portion to be stretched. They then were sheared apart and tested.

Two impact spots appear with each sample. The upper spot is made by an impact machine which allows an 8-pound weight to fall 22½ inches on a ½-inch steel ball in contact with the sample. These spots are a full ¼-inch deep. The lower impact spots were made in the same way except that a 5-pound weight was allowed to fall 12¼ inches on the ball. This was insufficient to draw the metal ¼-inch, so the grading area is considerably reduced and its appearance changed somewhat. The band or fringe of fractured enamel forming an outer border of these shallow impact spots appears much like those obtained with early fracturing with 1, 2 or 3 per cent stretch.

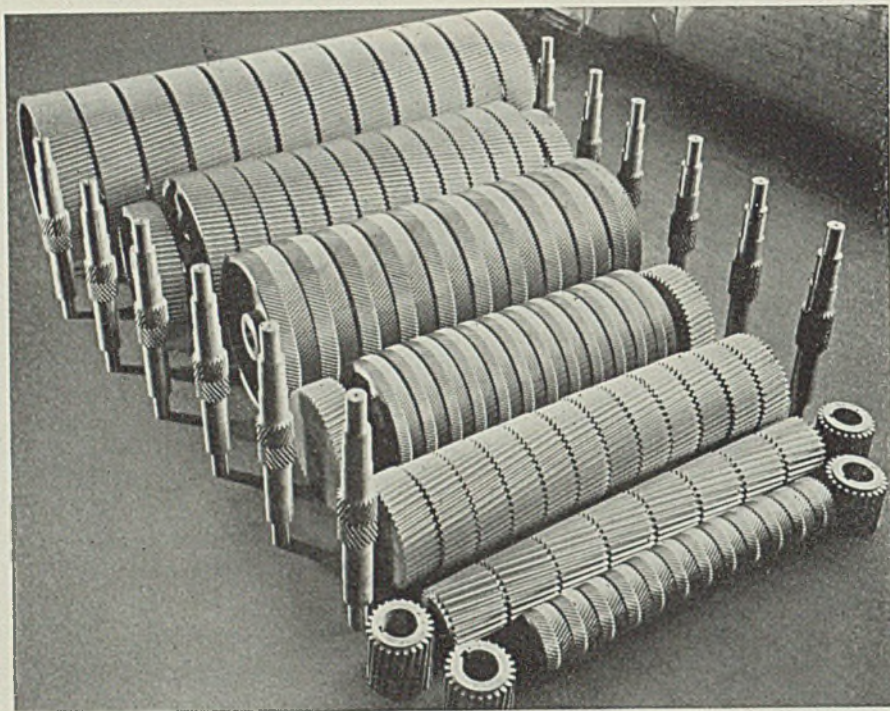
Bond Variations Noted Readily

Detailed examination of Fig. 4 will show that the differences in bond due to variations in enameling practice are more readily detected on the flat stretched specimens than on the impact spots. In a good many cases the impacts look alike while a difference can be observed readily in the drawn samples. Perhaps this is partly because the drawn samples have a larger and more representative test area which can be judged more easily by the eye.

The photomicrographs show the interface between the enamel and the metal. A layer of iron oxide exists at the interface in the cases of extremely poor bond, but disappears and is replaced by interlocking fingers of metal and enamel as the bond tends to improve.

It is evident the stretch testing method has a number of advantages which make it extremely valuable in judging the comparative adherence of porcelain enamel to sheet metal. The only important limitation of the method appears that it is confined to flat specimens and is not adaptable to checking irregular surfaces. However, this should prove no serious fault as in any enameling control method adopted in actual production work it would be simple to process flat test specimens along with regular work to check enameling practice.

Usual tensile-testing equipment



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may be supplanted by a device now being contemplated having one fixed grip and one movable, the latter connected by a gear system to a small motor. Specimens could then be clamped in position and, by using automatic stops, be drawn as desired without the need of gage marks. Grips could be designed to hold enameled surfaces firmly, thus permitting samples to be cut directly from enameled panels and tested. This device should reduce the testing time per sample to where it would be comparable with the impact test.

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long-fiber asbestos, antifrictional metal particles and special binders. It contains no oils that can be driven off by heat or pressure and it is recommended for centrifugal and rotary services such as centrifugal feed pumps, low-pressure steam rods, valve stems, centrifugal pumps, rotary pumps and expansion joints. It is available in six styles for special services.

Each of the types is available in sizes from $\frac{1}{4}$ to 1 inch graduated by sixteenths, in coils, standard length spirals or in die-formed rings or sets to stuffing-box dimensions.

"Controlled" shot, Grit To Aid in Finishing

Standard shot and grit now can be controlled by a new process so that each size is given the correct processing in order to produce the best degree of toughness and hardness in relation to its size, according to National Metal Abrasive Co., 3560 Norton road, Cleveland. Both shot and grit now can be bought to give the most advantageous results for each particular application. Their use is claimed to reduce operating costs.

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**QUALITY
COUNTS!**



THERE'S no substitute for Kester Cored Solders when you're building quality equipment. When you solder metal parts, you have to be sure they're going to *stay soldered* or the entire usefulness of the product itself is endangered.

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Kester makes them all.

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Kester engineers, with 43 years of solder experience back of them, can help you select the right solder for each metal-working operation. Ask for their expert advice on your soldering problems. They can save you time and money and help you improve your products.

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Plastic Packing Now Has Reinforced Back

Crane Packing Co., 1800 Cuyler avenue, Chicago, announces a new development in the manufacture of its Super-Seal plastic packing. It is now being made with a patented tape back reinforcement securely vulcanized to the outer surface of the packing. This reinforcement replaces the old frictional woven cotton jacket and now a non-frictional surface bears directly against the moving part. Due to the reinforcement, this new packing is extremely pliable and can be bent around small diameter rods and shafts without fracturing or cracking, or formed into small inside diameter rings without distortion.

Super-Seal itself is a dry-graphitized plastic packing made from

As Workers View Election

(Concluded from Page 33)

turns. We were sitting in his office in one corner of the works administration building. We could look out of the window and see the No. 1 gate. He called attention to the crowd of men coming through the clock house and then said, "I was down in Washington last week and I was fortunate enough to see the crowd of government employes pour out of the buildings there. If you don't think the government has an army of men working, you should check it with your own eyes.

Boy, that crowd of men coming out of our plant now is a pigmy along side that of the Capitol. If we had to have as many employes to run our plant as I saw there, we'd sink in 24 hours."

The question was asked concerning the attitude of the men out in the shop since the election. "There has been no change in some parts of the plant," he replied, "though some of our foremen report the men are getting more cocky and have to be handled with kid gloves."

This condition seemed to prevail in many other plants as well.

In one section of a steelmaking

district there is a fabricating plant on the outskirts of the city. A high executive of this company in question formerly was the sales manager of a large steel company. He knows how to sell steel and he knows how to buy steel. His telephone operator announced my presence and in the course of time we were engaged in conversation in his office.

"I voted for F.D.R. the first time," he stated. "I've always voted the Democratic ticket. The gentleman made mistakes, I grant you. Plenty of them. But I'm always willing to give a fellow a second chance, so I voted for him the second time hoping that he'd do at least a little better. If you've seen what I've seen the past four years then you'll understand why a Democrat of long standing cast his vote for a Republican the other day . . ."

"Yes, but how does it come you've got the President's picture hanging on your wall?" I inquired.

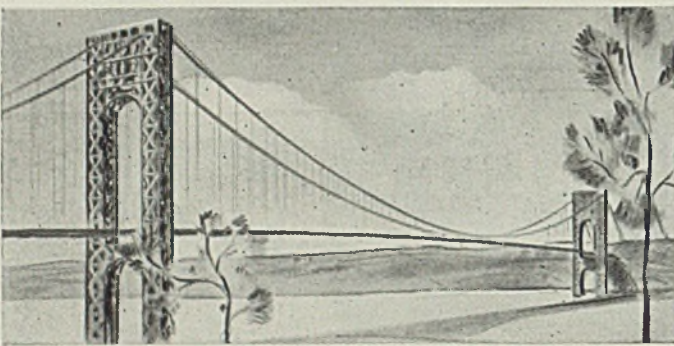
"For two reasons," he said with a twinkle in his eyes. "First, the fellows who look over your books for tax purposes, don't usually squint so closely when they see that photograph; and second, when the Republicans come in for contributions they take a look at the picture and not knowing my political stand they sort of wonder how much to request." And then he burst into a roaring laugh. No wonder he can buy and sell steel to advantage.

Armament Program—Leverage

"I'll tell you, J.D.," he says, "the party has the armament program to play with and it seems to me they'll soon use it as a leverage. They've got to become more friendly with industry for they're going to need the steel mills more than ever. At the same time they've got to be on friendly terms with labor. In other words they've one end of the lasso around the industrial body and the other end around the labor body and in short order we may expect a pull, first in this direction and then a pull in that direction. The armament program will ring the bell. The canaries will begin to sing. They'll say, 'Industry, you be patriotic and show the country what you can do in the face of emergency; labor, see how the mills are humming and how your job is assured for months to come.'"

"Yes, but the war will not always be with us."

"That's right and how solemn the thought. Back in 1932 we were working our mills at 10 per cent of capacity. The work was shared. All our men at least got a few days work. The picture wasn't pleasant. One of these days the bugle will



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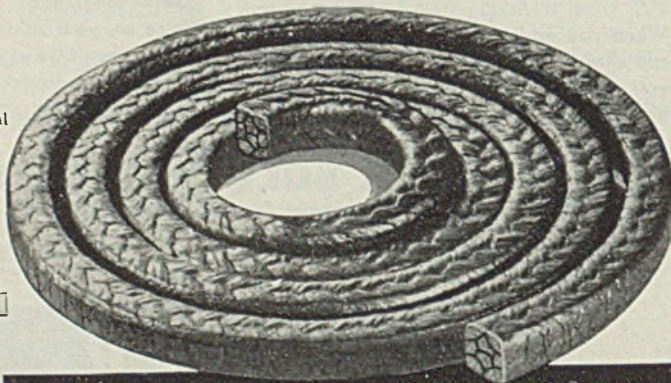
An engineering masterpiece is the George Washington Bridge, handling over 20,000 heavy vehicles a day. Like the George Washington Bridge, GARLOCK 90 Waterproof Hydraulic Packing is also constructed for heavy duty. Manufactured from the longest fibre, imported roving, sorted and graded by flax experts and braided with extreme care, GARLOCK 90 is unusually strong and durable. Recommended for rams, accumulators, hydraulic pumps, elevator plungers or outside packed pumps handling cold water or cold oil. All sizes from 1/8" to 3".

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GARLOCK 99—Ring



GARLOCK 90

announce she's over and then what? When the armament program collapses, then what are the boys going to say? I may be crazy in some of my assertions, but I'll bet we'll not be working 10 per cent of capacity."

While chatting with another steelworks official he pointed out that we're living in the land of "Give Me". "Give me this and give me that. Old age pensions, relief served on various platters, grocery orders here, coal orders there. Too many WPA workers are playing leap frog in the land of "give me". The sooner we recognize man must earn his bread by the sweat of his face until he returns unto the ground, and not by leaning on a shovel, the sooner our country will be restored to normalcy."

"Some feel that the election was lost because . . ."

My statement, however, was never completed for he interrupted, "Lost, my eye. Some folk were just on the losing side, that's all. Nothing was lost. The same principles that existed before election, still remain in all their freshness. Let us not forget them for they still are worthy of serious consideration as long as we're playing Alice in Wonderland."

His parting remark was this:—"The boys down at Washington probably will make every effort to get back of business, for some one in this country will be called upon to pay the taxes for the emergency condition that has been set up in our land. If they're smart, they'll not let the grass grow under their feet."

Much more could be written but enough has been presented to give a cross section of thought out where iron ore is brought into the plant in open hoppers and finished steel sneaks out the finishing end in sealed cars or wrapped for trucking to various points of destination.

Wind Power May Feed Vermont's Power Lines

■ Wind power may soon feed Vermont power lines according to *Industrial Bulletin*, published by Arthur D. Little Inc., Cambridge, Mass.

Utilizing vanes patterned after airplane wings with a wing-spread approximating that of the largest modern bombing planes, the initial experimental vento-electric station is designed to produce 1000 kilowatts—enough to light five 100-watt lamps apiece for 2000 families. Its location on Grandpa's Knob, atop a Green Mountain ridge near Rutland, was selected after elaborate meteorological investigation. It is expected to provide wind sufficiently steady for an availability factor greater than that for stored water

as used in New England, and electric power competitive with the cheapest firm power now available. The project depends not only upon current research in aerodynamics and meteorology, but also upon recent engineering developments of numerous industries.

The principal problem has been to provide the generating unit with accurate speed regulation, despite tremendously fluctuating wind velocities. Uncontrollable gusts would raise the output from 1000 to 3000 kilowatts in less than 3 seconds and seriously overload the generator. Patentable developments are claimed to overcome this prob-

lem together with other problems, such as ice-formation, which have arisen during the development studies.

The choice of a site can make or break the installation. Although this initial installation is on a mountain top, meteorological surveys indicate that suitable winds exist at such diverse locations as the Great Plains and on various marine islands.

With capacity from other sources available to control current frequency and for use when a wind station is becalmed, a dependable supply of electricity may be provided for general distribution.



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New Radiator Plant

(Continued from Page 75)

solder only about 1/4-inch on each face; careful control of the level of flux and solder is essential to hold this depth.

The solder tank is kept filled from an auxiliary preheat pot. The tank is heated through pipes at the bottom in which butane gas is burned at 1 1/2-pounds pressure. Temperature of the solder is held closely by means of recording and controlling pyrometers.

Frame Lifted by Overhead Arms

A turnover station is provided after one face of the core has been soldered. Following the soldering of the reverse face, the frame is lifted off the core by overhead arms and returned to the starting point on an overhead conveyor. Cores are placed on a roller table and are moved to an operator who gives each unit what is termed a "header" dip in another solder tank, the header being the end of the core where the lockseams of the outer ribbons are exposed.

Cores next are assembled to top and bottom tanks, being mounted in universal fixtures, 12 of which are carried on a 40-foot chain conveyor loop. Tanks are attached to the core by hand soldering irons. At this point the outlet fitting also is soldered to the bottom tank.

The assembled cores and tanks then are placed on trays carried on a 108-foot chain with 36 fixtures which move the units to the first test station. One end is sealed and air pressure introduced at the other

end while the assembly is submerged in water. Rising bubbles indicate any leaks, which are quickly repaired with torches or hand soldering irons. From this point, a 60-foot chain conveyor with 20 hangars carries the radiators to the next operation, termed the "sidewall solder-off," involving another conveyor system duplicating that used in assembly of tanks and cores, except that only 10 universal fixtures are provided on the 40-foot loop. Here sidewall assemblies (strips and reinforcing) are torch soldered to the core.

(Concluded Next Week)

Mirrors of Motordom

(Concluded from Page 36)

cent. However, some engine builders are preparing to change to forged steel crankcases, in the hope of still further strengthening this vital part without undue increase in weight.

Cylinder barrels are the most expensive parts of radial engines and must be of steel free from any inclusions. First made from S.A.E. 1015 steel, with 218-221 brinell, they are now generally of S.A.E. 4140, with 300-337 brinell. Some 1000-horsepower engines are using nitralloy steel for barrels, the bore being nitrided to a case depth of 0.020-0.025-inch which gives Vickers hardness of 850-1000 and provides a barrel which will last the life of the engine.

Another vital element in radial engines is the master rod bearing.

Practice today is to use a steel shell, solid or split with 1/32-inch of lead bronze lining. The bronze contains 20 per cent lead, with slight amounts of silver or tin for hardening. Mr. Moore suggested that the need may be evident shortly for something better and he suggested the use of a steel backing lined with pure silver, perhaps coated with lead or a mixture of lead and indium.

Quality, Vital Consideration

A vital consideration in all aircraft steel is the control of quality. Small defects are serious. Grain flow in forgings must follow the contour of the part. Holes, small fillets, sharp corners, even rough machined surfaces often prove to be stress raisers which have a devastating effect on fatigue life. Even identifying marks on steel, stamped or etched, may be the nuclei of fatigue cracks.

Magnaflux testing, with both direct and alternating current, is used widely to detect small cracks in finished steel parts which may escape visual detection or which may have been easily covered over by grinding.

Mr. Moore illustrated a wide assortment of parts in which fatigue cracks were detected by the magnaflux method. Failures originating from this cause are common in the automotive industry, although their results usually do not prove so disastrous as they might be in the airplane engine.

An interesting point brought out in the discussion of Mr. Moore's presentation was the fact that completely new standards for aircraft steels now have been developed and henceforth will be specified on drawings of parts. These specifications are known as aircraft material standards (A.M.S.) and are available from the Society of Automotive Engineers at \$6 per set. Steel specifications cover not only analyses but also other factors such as hardenability, magnaflux testing, etc.

A few examples of the corresponding S.A.E. and A.M.S. specifications are as follows:

| S.A.E. | A.M.S. |
|-----------|-----------|
| 1112..... | 5010 |
| 1335..... | 5024 |
| 4340..... | 6412 |
| 3312..... | *6250-234 |

*Depending upon carbon content, the four varieties covering from 8 to 17 points of carbon.

Mention also was made of a new method for testing nonmagnetic 18-8 chrome-nickel steel wire for small defects. In use at the Naval Aircraft Factory, the method is electrolytic in nature, being based on the behavior of eddy currents.

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EXTRA! For maintenance and repair work, as well as production operations, STRESSPROOF is the ideal steel, possessing right in the bar unique wearability, high strength, free machinability, and minimum warpage.

By LA SALLE STEEL COMPANY

Manufacturers of the Most Complete Line
of Cold Finished Steel Bars in America

Chicago, Illinois

ANOTHER LEADING FIRM ADOPTS NEW BAR STEEL

Kalamazoo Railway Supply Replaces H. T. 4140 with STRESSPROOF

"Kalamazoo Means Service to You" is the slogan of one of the Nation's largest railway equipment manufacturers, the Kalamazoo Railway Supply Co. It is not surprising therefore to find among the materials this firm uses in building its equipment the new all-purpose steel bar STRESSPROOF.

This new cold finished bar, for example, is used for drive axles in the "51" and "52" railway motor cars famous in railway maintenance circles for rugged construction and simple economical operation.

Straightening Is Eliminated

Their drive axle is 63 inches long, key-seated in the center and threaded at either end. Until quite recently heat treated SAE 4140 was the standard steel for this part, principally because it possessed the required strength. But a heat treated steel is far from easy to machine, and warping after machining—particularly over a 5-foot length—calls for subsequent straightening.

When shown that STRESSPROOF would undoubtedly solve both problems, and was at the same time strong enough to stand up under heavy duty service characteristics of railroading, a first order was put into stock.

Machining at 80% of Bessemer screw

(Continued on Page 2, Col. 3)

Users of Flats Find Unvarying Uniformity Key to Lower Costs

Bright, Smooth Surface and Freedom from Defects Make
La Salle Flats Valuable Aids to Stepped-Up Efficiency

"Re-engineering" of specifications to take advantage of modern steels generally concern bars in carburizing, alloy, heat treating or other grades. Flats, to many users—and suppliers as well—are just flats and don't ordinarily receive much consideration.

Yet according to La Salle representatives who regularly make the rounds of steel users, flats in the right grades and finish offer almost unlimited opportunities for whittling down production costs. Here's a composite picture drawn from the experience of dozens of users who have discarded the "just plain flat" idea in favor of the grade shown superior by factual data and comparative cost records.

Rejections Reduced by User

Company "A" was a manufacturing concern which used a large supply of flats in fabricating racks, stampings, guides and similar items. From past experience, the firm had accepted as a matter of course a high percentage of rejects.

Pitted and rough surfaces were a common occurrence, often necessitating great wastage of material. Seldom was fabrication possible without grinding down flats to a smooth surface.

An analysis of the user's steel problem

by a La Salle representative brought this condition to the management's attention. A trial order of La Salle flats was run through the plant with results along this line:

Grinding Is Minimized

Grinding which was formerly regarded as a major production operation, was minimized to the point where a good share of parts could be made from the material just as received from the La Salle mill. Bright, shiny finish and smooth surface without defects often made possible plating and other operations without any—or at best very little—grinding. Corners were clean, sharp and square. Sizes were well within standard accuracies. Of course, costs on flat applications came down and "La Salle" regularly went on future purchase orders for flats.

Uniformity Assured by Control

Behind this typical occurrence in the user's plant is a story of unusual control. Since the first requirement in flats is uniformity—in structure of steel as well as surface—La Salle guards quality right from the start. Metallurgical specifications for the material—from the first manufacturing operation are set up within pre-determined tolerances—and rigidly held within those tolerances.

Thus the raw material is several steps ahead in uniformity before a single finishing operation takes place. From that point on, each subsequent step is examined for quality. The result is a product so reliably uniform that plant after plant has standardized on La Salle Flats with significant reductions in production costs.

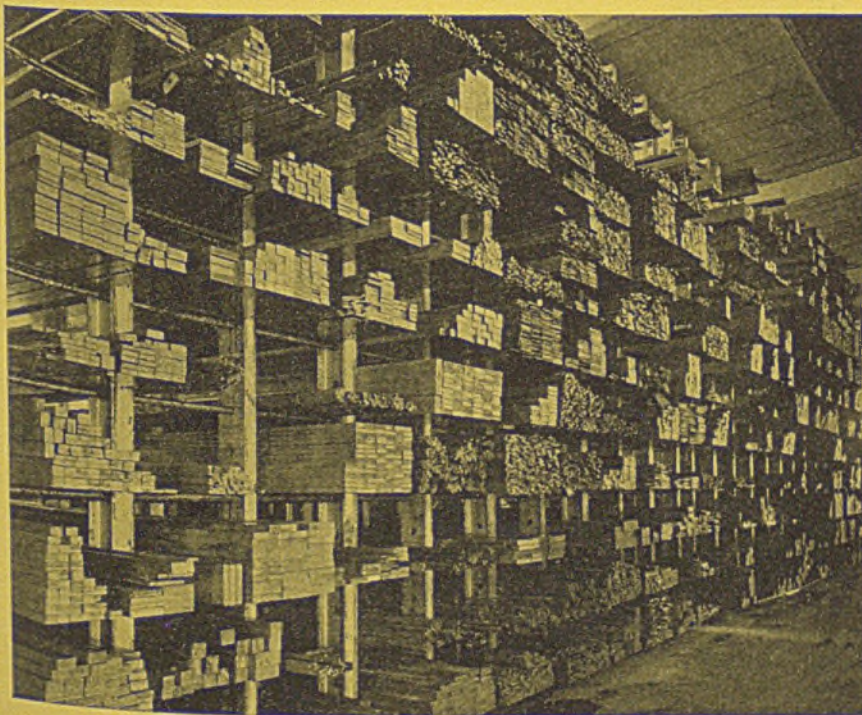
Advantages of 1020-90 Analysis

La Salle Flats are available in the well-known La Salle 1020-90 (now designated as SAE X-1020) analysis. This is the grade developed by La Salle and commonly recognized as the best non-alloy case carburizing steel available. At the time of its introduction it set a new high standard for uniformity—a uniformity that pays dividends to the user of flats in terms of excellent carburizing qualities, freedom from surface defects and exceptional homogeneity, density, normality and resistance to shock.

Complete Size Range Available

All standard sizes are regularly carried in stock, from $\frac{1}{8}$ " thick by $\frac{1}{4}$ " wide to 2" thick by 12" wide (plus flats 3" thick by 6" wide) in 12 foot lengths. And despite

(Continued on Page 2, Col. 2)



Metallurgy FOR THE SCREW MACHINE ENGINEER

Everyone knows there is more to the machining of steel than pushing the starting button. The skill of the operator, the tools used and the equipment are all of primary importance.

But of equal importance with these 3 is a knowledge of steel on the part of the machinist. Different steels naturally require different cutting techniques. It is the operator with a general knowledge of the various grades who will not only find his work made easier and faster, but will also be able to report larger production runs day after day.

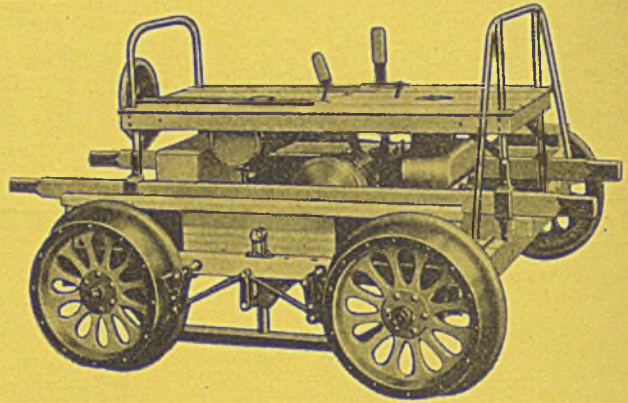
The operator's greatest machinability problems generally stem from the higher carbon alloy steels since they are usually furnace treated and the resultant structure can vary considerably.

Alloy steels are usually machined in the annealed condition and it is the structure resulting from the annealing treatments that determine their machinability. At approximately the same hardness the structure may be lamellar pearlite or completely spheroidized.

Now lamellar structure is considered desirable for drilling, broaching, milling or similar types of cutting or where smooth finish through light finishing cuts is desired. Spheroidized type of structure, on the other hand, is usually found best for heavy form cutting and lathe cutting where a considerable volume of metal is to be removed. Where a combination of machining operations of both types are required combination structures are employed. Improvements in machining qualities are noted when any of the above structures are Cold Drawn.

Heat Treated-in-the-Bar Alloys are pro-

Right: One of the famous "Kalamazoo Safety First" line of railway motor cars. STRESSPROOF used for the drive axle, replacing H. T. 4140 at considerable savings in production cost.



Below: Close-up of STRESSPROOF motor car drive axle. Axle is 63 inches long.



LA SALLE FLATS ANSWER NEED FOR UNIFORMITY

(Continued from Page 1, Col. 3)

current increased demand, supplies are available for prompt mill shipment, an attribute of the long-standing La Salle policy of maintaining production facilities considerably in excess of the greatest demand in any 3 months' period.

duced to minimum physical strengths and the structure therefore is controlled by the specified physical properties. Incorrect quenching practices distort the desired structures from a machining standpoint and result in a wide variation of center to outside hardness.

Therefore, when machining the hard steels insist on steels that have been correctly treated at the mill such as La Salle's TUFTORK (Heat Treated 4140), Annealed 3140 and Annealed 4140. It will speed up production and help considerably in extending tool life and holding down rejections.

STRESSPROOF Shafts Reduce Machining Operations For Railway Supply Firm

(Continued from Page 1, Col. 1)

steel and with minimum warpage, STRESSPROOF pulled down production costs. Machining rates were upped, and costly straightening operations entirely eliminated. Still further savings resulted from lower material costs. To cap it off, one of the Nation's large railway systems ran exhaustive tests on cars with the STRESSPROOF axles and gave them unqualified approval.

When Not to Use STRESSPROOF

STRESSPROOF by reason of its unique wearing qualities can be substituted for case carburized steel in many applications. It should be noted, however, that STRESSPROOF has a Yield Strength of 90,000 or 100,000 lbs. p.s.i. minimum (depending on size), and therefore, is not suitable for parts case carburized and subjected to high unit pressures and severe Brinelling action.

Comparative Physical Properties Alloy Heat Treating Steel—(Heat Treated Small Section Average)

| Analysis | Draw ° F. | Brinell Hardness | Tensile Strength psi | Yield Point psi | Elongation in 2" % | Reduction of Area % | Iron Impact Ft. Lbs. | Purpose |
|--------------------------------------|-----------|------------------|----------------------|-----------------|--------------------|---------------------|----------------------|--|
| TUFTORK (Heat Treated La Salle 4140) | | 230-290 | 125,000 | 105,000 | 16 | 50 | | A heat treated in-the-bar steel. Parts require no heat treating after machining. Physical properties shown are guaranteed minimum. |
| La Salle 4140 | 600 | 436 | 220,000 | 196,000 | 11 | 38 | 7 | Best machining of all alloy steels. Combines strength, toughness and reliable response to heat treatment. |
| | 800 | 372 | 189,000 | 137,000 | 14 | 49 | 24 | |
| | 1000 | 292 | 147,000 | 123,000 | 18 | 56 | 56 | |
| | 1200 | 236 | 118,000 | 90,000 | 24 | 64 | 83 | |
| La Salle 3135 3140 | 600 | 420 | 212,000 | 185,000 | 10 | 37 | 6 | Standard alloys for years, now being replaced by TUFTORK and La Salle 4140 in many applications. |
| | 800 | 355 | 175,000 | 148,000 | 13 | 51 | 30 | |
| | 1000 | 270 | 136,000 | 110,000 | 17 | 57 | 65 | |
| | 1200 | 225 | 110,000 | 85,000 | 23 | 64 | 89 | |

La Salle

STEEL COMPANY

Address: Dept. 11-A, Box 6800-A, CHICAGO, ILL.

MANUFACTURERS OF

- Cold Drawn Shafting
- Ground Shafting
- Turned and Polished Shafting
- Bessemer Screw Steels
- Open Hearth Carburizing Steels
- Alloy Carburizing Steel
- Open Hearth Heat Treating Steels
- Alloy Heat Treating Steels
- STRESSPROOF STEELS
- Leaded Steels
- Furnace Treated Hot Rolled Steels
- Special Sections



Most Steel Departments

Experience More Gains

Sales and shipments are stepped up again. Only output remains stable. Major job is to dole tonnage equitably.

■ ELEMENTS of the steel situation become ever more tense with sales and shipments increasing, deliveries falling further behind and prices on the few doubtful products strengthening. Only production remains relatively stable because it is at virtual full capacity. But capacity is being increased, announced plans of a southern steelmaker to step up pig iron, coke, and other facilities, being perhaps a forerunner of more general gains to come.

Ingot production last week sagged $\frac{1}{2}$ -point to 96 per cent, due to furnace repairs and a strike at Pittsburgh. This was the first recession since the first week in September, but is not regarded as significant.

Major efforts of sales departments are directed towards apportioning steel equitably, separating urgent needs from those more remote and making a distinction between regular and transient customers. Worries as to ultimate sufficiency of supply become more acute, though according to one theory the spring will witness calmer conditions as by that time structural steel for new plants and machinery for their operation will have been taken care of. It is possible, too, that consumers will have built up inventories well by then.

A surprisingly large share of new steel business is due to expanding civilian uses. High industrial operating rates, with attendant good employment, have created spending power which results in purchasing of automobiles, radios, refrigerators and luxury items, thus setting into motion an ascending cycle of steel consumption and production.

That conditions are changing rapidly is shown in hot-rolled sheets, which a fortnight ago were most relaxed in delivery at three to four weeks. But a sudden demand appeared after the election which has forced several producers out of the market for 1940.

Some major producers report orders booked for shipment as far ahead as July at prices then prevailing. Though consumers exert increasing pressure for producers to name first quarter prices, they are less concerned than in other years, since assured delivery is the main consideration.

Quiet in pig iron sales contrasts with steel, but iron shipments this month are the best for the year as

consumers lay in stocks for the winter. Fluorspar prices are higher at around \$20.50 per ton, partly because of good exports, whereas we usually import.

Automobile production increases more slowly, but with a new high of 121,943 units for the week ended Nov. 16, comparing with 86,700 a year ago, up 995 for the week.

Prices show the most definite trend upward in several weeks. The steel scrap composite has changed for the first time in six weeks, rising 17 cents to \$20.71, due to two advances of 25 cents at Chicago. Iron and steel composite is 1 cent higher at \$38.07, while finished steel is unchanged at \$56.60.

A leading pig iron producer has kept all salesmen at home for three weeks. Steel salesmen usually solicit only products where demand has lagged, such as tin plate and oil pipe. Other salesmen contacts are made to maintain goodwill only. Conspicuous because of its sluggishness is tin plate, which remains at 44 per cent operations, probably lowest in the industry. Apparently negotiations on contracts for 1941 have not yet been completed, it being customary to make no price announcement until this is accomplished. No change is indicated.

The more farsighted are already contemplating possible surpluses of equipment and materials when world conditions become peaceful again, many expecting to draw on post-World war experiences to cope with the situation.

Steel ingot production gained in three areas last week, fell in three and was unchanged in six, resulting in a general rate of 96 per cent. Youngstown improved 1 point to 93 per cent, Chicago 2 points to 99 and Cleveland $1\frac{1}{2}$ points to 88 per cent. Declines were: Cincinnati, 6 points to 88, Pittsburgh, 3 points to 94 and Buffalo, $2\frac{1}{2}$ points to $90\frac{1}{2}$ per cent. Unchanged were Birmingham at 100 per cent, St. Louis at 85, Detroit at 93, Wheeling at $98\frac{1}{2}$, New England at 85 and eastern Pennsylvania at 94 per cent.

Considering the long period of high operations equipment is regarded as having held up remarkably well. The widespread call for all facilities in the rush of last quarter, 1939, may account for the good condition of machinery now.

Demand

Increases constantly.

Prices

Uniformly stronger.

Production

Off $\frac{1}{2}$ point to 96 per cent.

COMPOSITE MARKET AVERAGES

| | Nov. 16 | Nov. 9 | Nov. 2 | One Month Ago Oct., 1940 | Three Months Ago Aug., 1940 | One Year Ago Nov., 1939 | Five Years Ago Nov., 1935 |
|---------------------|---------|---------|---------|-----------------------------|--------------------------------|----------------------------|------------------------------|
| Iron and Steel.... | \$38.07 | \$38.06 | \$38.06 | \$38.07 | \$37.70 | \$37.50 | \$33.15 |
| Finished Steel | 56.60 | 56.60 | 56.60 | 56.60 | 56.60 | 55.90 | 53.70 |
| Steelworks Scrap.. | 20.71 | 20.54 | 20.54 | 20.56 | 18.71 | 20.06 | 12.92 |

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 | Nov. 16, 1940 | Oct. 1940 | Aug. 1940 | Nov. 1939 | Pig Iron | Nov. 16, 1940 | Oct. 1940 | Aug. 1940 | Nov. 1939 |
|----------------------------------|---------------|-----------|-----------|-----------|-----------------------------------|---------------|-----------|-----------|-----------|
| Steel bars, Pittsburgh | 2.15c | 2.15c | 2.15c | 2.15c | Bessemer, del. Pittsburgh | \$24.34 | \$24.34 | \$24.34 | \$24.34 |
| Steel bars, Chicago | 2.15 | 2.15 | 2.15 | 2.15 | Basic, Valley | 22.50 | 22.50 | 22.50 | 22.50 |
| Steel bars, Philadelphia | 2.47 | 2.47 | 2.47 | 2.47 | Basic, eastern, del. Philadelphia | 24.34 | 24.34 | 24.34 | 24.34 |
| Iron bars, Chicago | 2.25 | 2.25 | 2.15 | 2.15 | No. 2 foundry, Pittsburgh | 24.21 | 24.21 | 24.21 | 24.21 |
| Shapes, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.10 | No. 2 foundry, Chicago | 23.00 | 23.00 | 23.00 | 23.00 |
| Shapes, Philadelphia | 2.215 | 2.215 | 2.215 | 2.215 | Southern No. 2, Birmingham | 19.38 | 19.38 | 19.38 | 19.38 |
| Shapes, Chicago | 2.10 | 2.10 | 2.10 | 2.10 | Southern No. 2 del. Cincinnati | 23.06 | 23.06 | 23.06 | 23.06 |
| Plates, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.10 | No. 2X, del. Phila. (differ. av.) | 25.215 | 25.215 | 25.215 | 25.215 |
| Plates, Philadelphia | 2.15 | 2.15 | 2.15 | 2.275 | Malleable, Valley | 23.00 | 23.00 | 23.00 | 23.00 |
| Plates, Chicago | 2.10 | 2.10 | 2.10 | 2.10 | Malleable, Chicago | 23.00 | 23.00 | 23.00 | 23.00 |
| Sheets, hot-rolled, Pittsburgh | 2.10 | 2.10 | 2.10 | 2.00 | Lake Sup., charcoal, del. Chicago | 30.34 | 30.34 | 30.34 | 30.34 |
| Sheets, cold-rolled, Pittsburgh | 3.05 | 3.05 | 3.05 | 3.05 | Gray forge, del. Pittsburgh | 23.17 | 23.17 | 23.17 | 23.17 |
| Sheets, No. 24 galv., Pittsburgh | 3.50 | 3.50 | 3.50 | 3.50 | Ferromanganese, del. Pittsburgh | 125.33 | 125.33 | 125.33 | 105.33 |
| Sheets, hot-rolled, Gary | 2.10 | 2.10 | 2.10 | 2.00 | | | | | |
| Sheets, cold-rolled, Gary | 3.05 | 3.05 | 3.05 | 3.05 | | | | | |
| 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 | 2.55 | | | | | |

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 |
| Re-rolling billets, Pittsburgh | 34.00 | 34.00 | 34.00 | 34.00 |
| Wire rods No. 5 to 3/8-inch, Pitts. | 2.00 | 2.00 | 2.00 | 1.92 |

Scrap

| | | | | |
|-------------------------------------|---------|---------|---------|---------|
| Heavy melt, steel, Pitts. | \$21.50 | \$21.30 | \$18.75 | \$21.90 |
| Heavy melt, steel, No. 2, E. Pa. | 19.75 | 19.75 | 18.35 | 19.25 |
| Heavy melting steel, Chicago | 20.25 | 19.85 | 18.15 | 17.45 |
| Rails for rolling, Chicago | 24.50 | 24.05 | 22.00 | 20.50 |
| Railroad steel specialties, Chicago | 23.25 | 23.25 | 21.05 | 21.50 |

Coke

| | | | | |
|---------------------------------|--------|--------|--------|--------|
| Connellsville, furnace, ovens | \$4.75 | \$4.75 | \$4.75 | \$5.00 |
| Connellsville, foundry, ovens | 5.75 | 5.75 | 5.75 | 6.00 |
| Chicago, by-product fdry., del. | 11.75 | 11.75 | 11.25 | 11.25 |

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 |

| Enamelling 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 |
| 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. | 2.21 1/2c |
| New York, del. | 2.27c |
| Boston, delivered | 2.41c |
| Bethlehem | 2.10c |
| Chicago | 2.10c |
| Cleveland, del. | 2.30c |
| Buffalo | 2.10c |

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 | 2.25c |
| Detroit, delivered | 2.47c |
| Philadelphia, del. | 2.52c |
| Boston, delivered | 2.49c |
| New York, del. | 2.50c |
| Gulf ports | 2.80c |
| 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. | 2.15c |
| Gulf ports | 2.50c |
| Pacific Coast ports | 2.60c |

| Rail Steel Bars, Base | |
|--|-------|
| Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm. | 2.05c |
| Gulf ports | 2.40c |
| Pacific Coast ports | 2.50c |

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 ties, (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, Chi. | | | |
| cago, Massillon, Canton, Bethlehem | 2.70c | | |
| Detroit, delivered | 2.80c | | |

| Alloy | | Alloy | |
|-------------------------------|--------------|--------------|--------------|
| S.A.E. Diff. | S.A.E. Diff. | S.A.E. Diff. | S.A.E. Diff. |
| 2000 | 0.35 | 3100 | 0.70 |
| 2100 | 0.75 | 3200 | 1.35 |
| 2300 | 1.70 | 3300 | 3.80 |
| 2500 | 2.55 | 3400 | 3.20 |
| 4100 0.15 to 0.25 Mo. | 0.55 | | |
| 4600 0.20 to 0.30 Mo. | 1.50 | | |
| 2.00 Ni | 1.20 | | |
| 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. | | | |

Alloy Plates (Hot)

| | |
|---------------------------------------|-------|
| Pittsburgh, Chicago, Coatesville, Pa. | 3.50c |
|---------------------------------------|-------|

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. | 3.00c |
| Carbon | |
| Cleve., Pitts. | 2.80c |
| 0.26-0.50 | 4.30c |
| 0.51-0.75 | 6.15c |
| 0.76-1.00 | 8.35c |
| 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 off |
| Do., ¾ and ¾ x 6-in. and shorter | 66 off |
| Do., ¾ to 1 x 6-in. and shorter | 64 off |
| 1 ¼ and larger, all lengths. | 62 off |
| All diameters, over 6-in. long | 62 off |
| Tire bolts | 52.5 off |

| Stove Bolts | |
|--|----------|
| In packages with nuts separate 72.5-10 off; with nuts attached 72.5 off; bulk 82 off on 15,000 of 3-inch and shorter, or 5000 over 3-in. | |
| Step bolts | 60 off |
| Plow bolts | 68.5 off |

| Nuts | |
|---------------------------------|-------|
| Semifinished hex. U.S.S. S.A.E. | |
| ½-inch and less. | 66 70 |
| ¾-1-inch | 63 65 |
| 1 ¼-1 ½-inch | 61 62 |
| 1 ¾ 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 |
|------------------------|-------|

Rivets, Washers

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

| | |
|--|-------------------------|
| Structural | 3.40c |
| ½-inch and under | 65-10 off |
| Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. i.c.l. | \$5.40; c.l. \$5.75 off |

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts. Lorain, Va. to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 ½ and 1 ½ less, respectively. Wrought pipe, Pittsburgh base.

| Butt Weld Steel | |
|-----------------|------------|
| In. | Blk. Galv. |
| ¾ | 63 ½ 54 |
| 1 | 66 ½ 58 |
| 1-3 | 68 ½ 60 ½ |

| Iron | |
|-------|---------|
| 1-1 ¼ | 30 13 |
| 1 ½ | 34 19 |
| 2 | 38 21 ½ |
| 2 ½ | 37 ½ 21 |

| Lap Weld Steel | |
|----------------|---------|
| 2 | 61 52 ½ |
| 2 ½-3 | 64 55 ½ |
| 3 ½-6 | 66 57 ½ |
| 7 and 8 | 65 55 ½ |

| Iron | |
|---------|-----------|
| 2 | 30 ½ 15 |
| 2 ½-3 ½ | 31 ½ 17 ½ |
| 4 | 33 ½ 21 |
| 4 ½-8 | 32 ½ 20 |
| 9-12 | 28 ½ 15 |

| Line Pipe Steel | |
|--------------------|------|
| 1 to 3, butt weld | 67 ½ |
| 2, lap weld | 60 |
| 2 ½ to 3, lap weld | 63 |
| 3 ½ to 6, lap weld | 65 |
| 7 and 8, lap weld | 64 |

| Iron | |
|---------------------|-----------|
| ¾ butt weld | 25 7 |
| 1 and 1 ¼ butt weld | 29 13 |
| 1 ½ butt weld | 33 15 ½ |
| 2 butt weld | 32 ½ 15 |
| 1 ½ lap weld | 23 ½ 7 |
| 2 lap weld | 25 ½ 9 |
| 2 ½ to 3 ½ lap weld | 26 ½ 11 ½ |
| 4 lap weld | 28 ½ 15 |
| 4 ½ to 8 lap weld | 27 ½ 14 |
| 9 to 12 lap weld | 23 ½ 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 |
| 1 ¼" O.D. | 13 \$ 9.72 |
| 1 ½" O.D. | 13 11.06 |
| 2" O.D. | 13 12.38 |
| 2 ½" O.D. | 13 13.79 |
| 2 ¾" O.D. | 12 15.16 |
| 3" O.D. | 12 16.58 |
| 3 ½" O.D. | 12 17.54 |
| 3 ¾" O.D. | 12 18.35 |
| 4" O.D. | 11 23.15 |
| 4 ½" O.D. | 10 28.66 |
| 5" O.D. | 9 44.25 |
| 5 ½" O.D. | 7 68.14 |

| Seamless | |
|-----------|--------------------|
| Sizes | Gage Rolled Drawn |
| 1" O.D. | 13 \$ 7.82 \$ 9.01 |
| 1 ¼" O.D. | 13 9.26 10.67 |
| 1 ½" O.D. | 13 10.23 11.79 |
| 1 ¾" O.D. | 13 11.64 13.42 |

| | | | |
|-----------|----|-------|-------|
| 2" O.D. | 13 | 13.04 | 15.03 |
| 2 ¼" O.D. | 13 | 14.54 | 16.76 |
| 2 ½" O.D. | 12 | 16.01 | 18.45 |
| 2 ¾" O.D. | 12 | 17.54 | 20.21 |
| 3" O.D. | 12 | 18.59 | 21.42 |
| 3 ½" O.D. | 11 | 19.50 | 22.48 |
| 3 ¾" O.D. | 11 | 24.62 | 28.37 |
| 4" O.D. | 10 | 30.54 | 35.20 |
| 4 ½" O.D. | 10 | 37.35 | 43.04 |
| 5" O.D. | 9 | 46.87 | 54.01 |
| 5 ½" O.D. | 7 | 71.96 | 82.93 |

Cast Iron Pipe

Class B Pipe—Pet 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 Std. ftgs., Birm., base \$100.00.

Semifinished Steel

| Rerolling Billets, Slabs (Gross Tons) | |
|--|---------|
| Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., 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 ½-inch incl. (per 100 lbs.) | \$2.00 |
| Do., over ½ to ¾-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. | 5.25- 5.50 |
| Connell, prem. fdry. | 5.75- 6.25 |
| New River fdry. | 6.50- 7.00 |
| Wise county fdry. | 5.50- 6.50 |
| Wise county fur. | 5.00- 5.25 |
| By-Product Foundry | |
| Newark, N. J., del. | 11.88-12.38 |
| Chicago, outside del. | 11.00 |
| Chicago, delivered | 11.75 |
| Terre Haute, del. | 11.25 |
| Milwaukee, ovens | 11.75 |
| New England, del. | 12.50 |
| St Louis, del. | 11.75 |
| Birmingham, ovens | 7.50 |
| Indianapolis, del. | 11.25 |
| Cincinnati, del. | 11.00 |
| Cleveland, del. | 11.55 |
| Buffalo, del. | 11.75 |
| Detroit, del. | 11.50 |
| Philadelphia, del. | 11.63 |

Coke By-Products

| | |
|---|---------|
| Spot, gal., freight allowed east of Omaha | |
| Pure and 90% benzol | 15.00c |
| Toluol, two degree | 27.00c |
| Solvent naphtha | 26.00c |
| Industrial xylo | 26.00c |
| 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 |
| Birmingham, Ala. | 19.38 | ..... | 18.38 | 24.00 |
| Birdsboro, Pa. | 24.00 | 24.50 | 23.50 | 25.00 |
| 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 | 23.50 | 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 | 22.00 | ..... | ..... | ..... |
| *Sharpville, 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. *One producer quotes \$2 higher on bessemer, \$1.50 higher on other grades.

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 |
| Millwaukee 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 |
| St. Louis, northern | 23.50 | 23.50 | 23.00 | ..... |

| | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---------------------------|-------------|-----------|-------|----------|
| 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

| Valley furnace | 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 silvers, 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 | Ladle Brick (Pa., O., W. Va., Mo.) |
|---|---|
| Fire Clay Brick | Dry press..... \$28.00 |
| Super Quality | Wire cut..... 26.00 |
| Pa., Mo., Ky. | Magnesite |
| First Quality | Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk..... 22.00 |
| Pa., Ill., Md., Mo., Ky. | net ton, bags..... 26.00 |
| Alabama, Georgia | Basic Brick |
| New Jersey | Pa., Ill., Ky., Md., Mo. |
| Second Quality | Georgia, Alabama |
| Pa., Ill., Ky., Md., Mo. | New Jersey |
| Georgia, Alabama | Ohio |
| New Jersey | First quality..... 39.90 |
| Intermediate..... 36.10 | |
| Second quality..... 31.35 | |
| Malleable Bung Brick | Washed gravel, duty pd., tide, net ton. \$25.00-\$26.00 |
| All bases..... \$56.05 | |
| Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail. 20.00-21.00 | |
| Silica Brick | Do, barge..... 20.00 |
| Pennsylvania..... \$47.50 | No. 2 lump..... 20.00-21.00 |
| Joliet, E. Chicago..... 55.10 | |
| Birmingham, Ala..... 47.50 | |

Ferrolloy Prices

| | | | | | | | |
|--|----------------|--|----------|--|--------|--|---------|
| Ferromanganese, 78-82%, carlots, duty pd. | \$120.00 | Do., ton lots | 11.75c | Do., spot | 145.00 | Silicon Metal, 1% iron, contract, carlots, 2 x 1/4-in., lb. | 14.50c |
| Ton lots | 130.00 | Do., less-ton lots | 12.00c | Do., contract, ton lots | 145.00 | Do., 2% | 13.50c |
| Less ton lots | 133.50 | less than 200 lb. lots | 12.25c | Do., spot, ton lots | 150.00 | Spot 1/4c higher | |
| Less 200 lb. lots | 138.00 | 67-72% low carbon: | | 15-18% tl., 3-5% carbon, carlots, contr., net ton | 157.50 | Silicon Briquets, contract carloads, bulk, freight allowed, ton | \$74.50 |
| Do., carlots del. Pitts. | 125.33 | Car-loads | 17.50c | Do., spot | 160.00 | Ton lots | 84.50 |
| Spliegelisen, 19-21% dom. | | loads | 18.25c | Do., contract, ton lots | 160.00 | Less-ton lots, lb. | 4.00c |
| Palmerton, Pa., spot | 36.00 | 2% carb. | 18.50c | Do., spot, ton lots | 165.00 | Less 200 lb. lots, lb. | 4.25c |
| Do., 26-28% | 49.50 | 1% carb. | 19.25c | Alsifer, contract carlots, f.o.b. Niagara Falls, lb. | 7.50c | Spot 1/4-cent higher | |
| Ferrosilicon, 50%, freight allowed, c.l. | 74.50 | 0.10% carb. | 20.50c | Do., ton lots | 8.00c | Manganese Briquets, contract carloads, bulk freight allowed, lb. | 5.50c |
| Do., ton lot | 87.00 | 0.20% carb. | 20.25c | Do., less-ton lots | 8.50c | Ton lots | 6.00c |
| Do., 75 per cent | 135.00 | Spot 1/4c higher | | Spot 1/4c lb. higher | | Less-ton lots | 6.25c |
| Do., ton lots | 151.00 | Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. | 0.95 | Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk | 7.00c | Spot 1/4c higher | |
| Spot, \$5 a ton higher. | | Calcium molybdate, lb. molyb. cont., f.o.b. mill | 0.80 | Do., ton lots | 7.50c | Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton | 102.50 |
| Silicomanganese, c.l., 2 1/2 per cent carbon | 118.00 | Ferrotitanium, 40-45%, lb., con. tl., f.o.b. Niagara Falls, ton lots | \$1.23 | Do., less-ton lots | 7.75c | Do., spot | 108.00 |
| 2% carbon, 108.00; 1%, 133.00 | | Do., less-ton lots | 1.25 | Do., less 200 lbs. | 8.00c | 34-40%, contract, carloads, lb., alloy | 14.00c |
| Contract ton price \$12.50 higher; spot \$5 over contract. | | 20-25% carbon, 0.10 max., ton lots, lb. | 1.35 | Do., less ton lots | 8.00c | Do., ton lots | 15.00c |
| Ferrotungsten, stand., lb. con. del. cars | 1.90-2.00 | Do., less-ton lots | 1.40 | Spot, 1/4c higher | | Do., less-ton lots | 16.00c |
| Ferrovandium, 35 to 40%, lb., cont. | 2.70-2.80-2.90 | Spot 5c higher | | Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. | \$2.50 | Spot 1/4c higher | |
| Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric runn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage | 75.00 | Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls | \$2.25 | Do., smaller lots | 2.60 | Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. | \$2.60 |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots | 11.00c | Do., less-ton lots | 2.30 | Vanadium Pentoxide, contract, lb. contained | \$1.10 | Do., 100-200 lb. lots | 2.75 |
| | | Spot is 10c higher | | Do., spot | 1.15 | Do., under 100-lb. lots | 3.00 |
| | | Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill | 0.80 | Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome, ton lots | 80.00c | Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant | 80.00c |
| | | Ferro-carbon-titanium, 15-18%, tl., 6-8% carb., carlots, contr., net ton | \$142.50 | Do., spot | 85.00c | | |
| | | | | 88% chrome, cont. tons | 79.00c | | |
| | | | | Do., spot | 84.00c | | |

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

| | Soft Bars | Bands | Hoops | Plates ½-in. & Over | Structural Shapes | Floor Plates | Sheets | | | Cold Rolled Strip | Cold Drawn Bars | | |
|-----------------|-----------|-------|-------|---------------------|-------------------|--------------|------------|-------------|--------------|-------------------|-----------------|-------------|-------------|
| | | | | | | | Hot Rolled | Cold Rolled | Galv. No. 24 | | Carbon | S.A.E. 2300 | S.A.E. 3100 |
| Boston | 3.98 | 3.86 | 4.86 | 3.85 | 3.85 | 5.66 | 3.51 | 4.48 | 4.66 | 3.46 | 4.13 | 8.88 | 7.23 |
| New York (Met.) | 3.84 | 3.76 | 3.76 | 3.76 | 3.75 | 5.56 | 3.38 | 4.40 | 4.30 | 3.51 | 4.09 | 8.84 | 7.19 |
| Philadelphia | 3.85 | 3.75 | 4.25 | 3.55 | 3.55 | 5.25 | 3.35 | 4.05 | 4.25 | 3.31 | 4.06 | 8.56 | 7.16 |
| Baltimore | 3.85 | 4.00 | 4.35 | 3.70 | 3.70 | 5.25 | 3.50 | .... | 5.05 | .... | 4.05 | .... | .... |
| Norfolk, Va. | 4.00 | 4.10 | .... | 4.05 | 4.05 | 5.45 | 3.85 | .... | 5.40 | .... | 4.15 | .... | .... |
| Buffalo | 3.35 | 3.62 | 3.62 | 3.62 | 3.40 | 5.25 | 3.05 | 4.30 | 4.40 | 3.22 | 3.75 | 8.40 | 6.75 |
| Pittsburgh | 3.35 | 3.40 | 3.40 | 3.40 | 3.40 | 5.00 | 3.15 | .... | 4.45 | .... | 3.65 | 8.15 | 6.75 |
| Cleveland | 3.25 | 3.30 | 3.30 | 3.40 | 3.58 | 5.18 | 3.55 | 4.05 | 4.62 | 3.20 | 3.75 | 8.40 | 6.75 |
| Detroit | 3.43 | 3.23 | 3.48 | 3.60 | 3.65 | 5.27 | 3.23 | 4.30 | 4.64 | 3.20 | 3.80 | 8.70 | 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 | 3.47 | 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 | 3.83 | 4.34 | 9.09 | 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 | 3.70 | .... | 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 | 3.65 | 3.75 | 5.75 | 3.70 | 6.50 | 5.00 | .... | 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 | 4.60 | 6.45 | 4.00 | 4.00 | 6.40 | 4.30 | 6.50 | 5.25 | .... | 6.60 | 10.55 | 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 |

| | S.A.E. Hot-rolled Bars (Unannealed) | | | | |
|-----------------|-------------------------------------|-------------|-------------|------------------|------|
| | 1035-1050 Series | 2300 Series | 3100 Series | 4100-6100 Series | |
| Boston | 4.18 | 7.75 | 6.05 | 5.80 | 7.90 |
| New York (Met.) | 4.04 | 7.60 | 5.90 | 5.65 | .... |
| Philadelphia | 4.10 | 7.31 | 5.86 | 5.61 | 8.56 |
| Baltimore | 4.45 | .... | .... | .... | .... |
| Norfolk, Va. | .... | .... | .... | .... | .... |
| Buffalo | 3.55 | 7.10 | 5.65 | 5.40 | 7.50 |
| Pittsburgh | 3.40 | 7.35 | 5.75 | 5.50 | 7.60 |
| Cleveland | 3.30 | 7.55 | 5.85 | 5.85 | 7.70 |
| Detroit | 3.48 | 7.67 | 5.97 | 5.72 | 7.19 |
| Cincinnati | 3.65 | 7.69 | 5.99 | 5.74 | 7.84 |
| Chicago | 3.70 | 7.35 | 5.65 | 5.40 | 7.50 |
| Twin Cities | 3.95 | 7.70 | 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 | 9.55 | 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, 150-1499 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; 25 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 Official Rates of Exchange

Export Prices f.o.b. Port of Dispatch—
By Cable or Radio

Domestic Prices at Works or Furnace—
Last Reported

| | Continental Channel or North Sea ports, gross tons | | **Quoted in gold pounds sterling £ s d | Fdy. pig iron, Sl. 2.5 | £ s d | French | Belgian | Reich | | | |
|-----------------------------------|--|------------------------------------|--|------------------------|------------|--------|---------|-------|---------|-----------|--------|
| | British gross tons U. K. ports £ s d | Quoted in dollars at current value | | | | | | | £ s d | Francs | Francs | Mark |
| Foundry, 2.50-3.00 Sl. | | \$33.23 | 3 18 0 | \$24.24 | 6 0 0 (a) | 788 | \$31.44 | 950 | \$25.33 | 63 | |
| Basic Bessemer | | | | 22.83 | 5 13 0 (a) | .... | 29.79 | 900 | 27.94 | (b) 69.50 | |
| Hematite, Phos. .03-.05 | | | | 6.77 | 1 13 5 | 4.91 | 225 | 10.92 | 320 | 7.64 | 19 |
| Billets | | | | 42.42 | 10 10 0 | 26.62 | 1,221 | 42.20 | 1,275 | 38.79 | 96 |
| Wire rods, No. 5 gage | | \$31.95 | 3 15 0 | 2.30c | 12 15 6 | 1.69c | 1,692 | 2.06c | 1,375 | 2.38c | 132 |
| Standard rails | | 60.71 | 7 2 6 | 2.78c | 15 8 6†† | 1.53c | 1,530 | 2.06c | 1,375 | 1.98c | 110 |
| Merchant bars | | | | 2.46c | 13 13 0†† | 1.49c | 1,487 | 2.06c | 1,375 | 1.93c | 107 |
| Structural shapes | | | | 2.55c | 14 3 0†† | 1.95c | 1,951 | 2.42c | 1,610 | 2.29c | 127 |
| Plates, + ½ in. or 5 mm. | | \$48.99 | 5 15 0 | 3.49c | 19 17 6‡ | 2.30c | 2,295‡ | 2.85c | 1,900‡ | 2.59c | 144‡ |
| Sheets, black | | | | 4.07c | 22 12 6 | 3.59c | 3,589 | 4.80c | 3,200 | 6.66c | 370 |
| Plates, + ¼ in. or 5 mm. | | | | 3.83c | 21 5 0 | 2.34c | 2,340 | 3.00c | 2,000 | 3.11c | 173 |
| Sheets, black, 24 gage or 5.5 mm. | | | | 2.91c | 16 3 6†† | 1.71c | 1,713 | 2.48c | 1,650 | 2.29c | 127 |
| Sheets, gal., 24 ga., corr. | | | | | | | | | | | |
| Bands and strips | | | | | | | | | | | |
| Plain wire, base | | | | | | | | | | | |
| Galvanized wire, base | | | | | | | | | | | |
| Wire nails, base | | | | | | | | | | | |
| Tin plate, box 108 lbs. | | \$ 6.21 | 1 10 9 | .... | .... | .... | .... | .... | .... | .... | .... |

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 | 18.00 |
| Bos. dock No. 1 exp. | 16.50-17.00 |
| New Eng. del. No. 1 | 17.00-17.50 |
| Buffalo, No. 1 | 21.00-21.50 |
| Buffalo, No. 2 | 19.50-20.00 |
| Chicago, No. 1 | 20.00-20.50 |
| Chicago, auto, no alloy | 19.00-19.50 |
| Cincinnati, dealers | 17.50-18.00 |
| Cleveland, No. 1 | 20.50-21.00 |
| Cleveland, No. 2 | 19.50-20.00 |
| Detroit, No. 1 | 16.00-16.50 |
| Detroit, No. 2 | 15.00-15.50 |
| Eastern Pa., No. 1 | 20.50-21.00 |
| Eastern Pa., No. 2 | 19.50-20.00 |
| Federal, Ill., No. 2 | 16.50-17.00 |
| Granite City, R. R. No. 1 | 17.25-17.75 |
| Granite City, No. 2 | 16.00-16.50 |
| Los Ang., No. 1 net | 12.50-13.00 |
| Los Ang., No. 2 net | 11.50-12.00 |
| N. Y. dock No. 1 exp. | 17.00 |
| Pitts., No. 1 (R. R.) | 23.00-23.50 |
| Pittsburgh, No. 1 | 21.00-22.00 |
| Pittsburgh, No. 2 | 19.50-20.00 |
| St. Louis, No. 1 | 17.25-17.75 |
| St. Louis, No. 2 | 16.00-16.50 |
| San Fran., No. 1 net | 13.00-13.50 |
| San Fran., No. 2 net | 12.00-12.50 |
| Seattle, No. 1 | 15.00 |
| Toronto, dlrs., No. 1 | 11.00-11.25 |
| Valleys, No. 1 | 21.00-21.50 |

COMPRESSED SHEETS

| | |
|---------------------|-------------|
| Buffalo | 19.50-20.00 |
| Chicago, factory | 19.50-20.00 |
| Chicago, dealers | 18.00-18.50 |
| Cincinnati, dealers | 16.50-17.00 |
| Cleveland | 20.00-20.50 |
| Detroit | 17.75-18.25 |
| E. Pa., new mat. | 21.00 |
| E. Pa., old mat. | 17.50-18.00 |
| Los Angeles, net | 9.25- 9.75 |
| Pittsburgh | 21.00-22.00 |
| St. Louis | 15.00-15.50 |
| San Francisco, net | 9.50-10.00 |
| Valleys | 19.50-20.00 |

BUNDLED SHEETS

| | |
|------------------|-------------|
| Buffalo, No. 1 | 19.00-19.50 |
| Buffalo, No. 2 | 17.50-18.50 |
| Cleveland | 15.00-15.50 |
| Pittsburgh | 19.50-20.00 |
| St. Louis | 13.50-14.00 |
| Toronto, dealers | 9.75 |

SHEET CLIPPINGS, LOOSE

| | |
|---------------------|-------------|
| Chicago | 16.00-16.50 |
| Cincinnati, dealers | 12.00-12.50 |
| Detroit | 14.00-14.50 |
| St. Louis | 13.00-13.50 |
| Toronto, dealers | 9.00 |

BUSHING

| | |
|----------------------|-------------|
| Birmingham, No. 1 | 14.50 |
| Buffalo, No. 1 | 19.50-20.00 |
| Chicago, No. 1 | 19.00-19.50 |
| Cincin., No. 1 deal. | 13.00-13.50 |
| Cincin., No. 2 deal. | 7.25- 7.75 |
| Cleveland, No. 2 | 14.00-14.50 |
| Detroit, No. 1 new | 17.00-17.50 |
| Valleys, new, No. 1 | 19.50-20.00 |
| Toronto, dealers | 5.50- 6.00 |

MACHINE TURNINGS (Long)

| | |
|------------|-------------|
| Birmingham | 7.50 |
| Buffalo | 13.50-14.00 |

| | |
|---------------------|-------------|
| Chicago | 14.25-14.75 |
| Cincinnati, dealers | 9.75-10.25 |
| Cleveland, no alloy | 13.50-14.00 |
| Detroit | 19.75-10.25 |
| Eastern Pa. | 14.50-15.00 |
| Los Angeles | 4.00- 5.00 |
| New York | 9.00- 9.50 |
| Pittsburgh | 15.50-16.00 |
| St. Louis | 11.00-11.50 |
| San Francisco | 5.00 |
| Toronto, dealers | 7.25- 7.50 |
| Valleys | 14.00-14.50 |

SHOVELING TURNINGS

| | |
|---------------------|-------------|
| Buffalo | 14.50-15.00 |
| Cleveland | 14.00-14.50 |
| Chicago | 14.50-15.00 |
| Chicago, spl. anal. | 15.00-15.50 |
| Detroit | 12.00-12.50 |
| Pitts., alloy-free | 17.00-17.50 |

BORINGS AND TURNINGS

For Blast Furnace Use

| | |
|---------------------|-------------|
| Boston district | 8.00- 8.25 |
| Buffalo | 13.50-14.00 |
| Cincinnati, dealers | 8.00- 8.25 |
| Cleveland | 14.00-14.50 |
| Eastern Pa. | 13.00-13.50 |
| Detroit | 11.50-12.00 |
| New York | 8.75- 9.00 |
| Pittsburgh | 14.50-15.00 |
| Toronto, dealers | 7.00- 7.25 |

AXLE TURNINGS

| | |
|----------------------|-------------|
| Buffalo | 17.00-17.50 |
| Boston district | 12.00-12.50 |
| Chicago, elec. fur. | 19.75-20.25 |
| East. Pa. elec. fur. | 19.50-20.00 |
| St. Louis | 13.25-13.75 |
| Toronto | 7.25- 7.50 |

CAST IRON BORINGS

| | |
|---------------------|-------------|
| Birmingham | 8.50 |
| Boston dist. chem. | 9.75-10.00 |
| Buffalo | 13.50-14.00 |
| Chicago | 13.75-14.25 |
| Cincinnati, dealers | 8.00- 8.25 |
| Cleveland | 14.00-14.50 |
| Detroit | 11.75-12.25 |
| E. Pa., chemical | 15.00 |
| New York | 10.00-10.50 |
| St. Louis | 10.00-10.50 |
| Toronto, dealers | 7.25- 7.50 |

RAILROAD SPECIALTIES

| | |
|---------|-------------|
| Chicago | 23.00-23.50 |
|---------|-------------|

ANGLE BARS—STEEL

| | |
|-----------|-------------|
| Chicago | 23.00-23.50 |
| St. Louis | 21.50-22.00 |

SPRINGS

| | |
|---------------|-------------|
| Buffalo | 25.50-26.00 |
| Chicago, coil | 24.50-25.00 |
| Chicago, leaf | 23.00-23.50 |
| Eastern Pa. | 25.00-26.00 |
| Pittsburgh | 27.50-28.00 |
| St. Louis | 22.75-23.25 |

STEEL RAILS, SHORT

| | |
|------------------------|-------------|
| Birmingham | 19.50 |
| Buffalo | 25.50-26.00 |
| Chicago (3 ft.) | 23.00-23.50 |
| Chicago (2 ft.) | 23.50-24.00 |
| Cincinnati, dealers | 23.75-24.25 |
| Detroit | 23.00-23.50 |
| Pitts., 2 ft. and less | 27.00-27.50 |
| St. L. 2 ft. & less | 23.75-24.00 |

STEEL RAILS, SCRAP

| | |
|-----------------|-------------|
| Birmingham | 17.00 |
| Boston district | 14.50-15.00 |

| | |
|------------|-------------|
| Buffalo | 22.50-23.00 |
| Chicago | 20.50-21.00 |
| Cleveland | 24.00-24.50 |
| Pittsburgh | 24.00-24.50 |
| St. Louis | 20.50-21.00 |
| Seattle | 18.00-18.50 |

PIPE AND FLUES

| | |
|---------------------|-------------|
| Chicago, net | 13.50-14.00 |
| Cincinnati, dealers | 12.75-13.25 |

RAILROAD GRATE BARS

| | |
|---------------------|-------------|
| Buffalo | 14.50-15.00 |
| Chicago, net | 14.00-14.50 |
| Cincinnati, dealers | 12.25-12.75 |
| Eastern Pa. | 18.50 |
| New York | 12.00-12.50 |
| St. Louis | 14.00-14.50 |

RAILROAD WROUGHT

| | |
|--------------------|-------------|
| Birmingham | 16.00 |
| Boston district | 9.50-10.00 |
| Eastern Pa., No. 1 | 20.00-20.50 |
| St. Louis, No. 1 | 14.50-15.00 |
| St. Louis, No. 2 | 16.50-17.00 |

FORGE FLASHINGS

| | |
|-----------------|-------------|
| Boston district | 12.00-12.25 |
| Buffalo | 19.50-20.00 |
| Cleveland | 19.00-19.50 |
| Detroit | 16.25-16.75 |
| Pittsburgh | 19.50-20.00 |

FORGE SCRAP

| | |
|-----------------|-------------|
| Boston district | 17.00 |
| Chicago, heavy | 24.00-24.50 |

LOW PHOSPHORUS

| | |
|-----------------------------------|-------------|
| Cleveland, crops | 23.50-24.00 |
| Eastern Pa., crops | 25.00-25.50 |
| Pitts., billet, bloom. slab crops | 28.00-28.50 |

LOW PHOS. PUNCHINGS

| | |
|-------------|-------------|
| Buffalo | 25.00-25.50 |
| Chicago | 23.00-23.50 |
| Cleveland | 21.50-22.00 |
| Eastern Pa. | 25.00-25.50 |
| Pittsburgh | 26.50-27.00 |
| Seattle | 15.00 |
| Detroit | 19.75-20.25 |

RAILS FOR ROLLING

5 feet and over

| | |
|-------------|-------------|
| Birmingham | 20.00 |
| Boston | 17.50-18.00 |
| Chicago | 24.25-24.75 |
| New York | 18.50-19.00 |
| Eastern Pa. | 25.00-26.00 |
| St. Louis | 23.50-24.00 |

STEEL CAR AXLES

| | |
|-----------------|-------------|
| Birmingham | 18.00 |
| Boston district | 18.50-19.00 |
| Chicago, net | 24.50-25.00 |
| Eastern Pa. | 25.00-25.50 |
| St. Louis | 24.75-25.25 |

LOCOMOTIVE TIRES

| | |
|------------------|-------------|
| Chicago (cut) | 23.00-23.50 |
| St. Louis, No. 1 | 20.50-21.00 |

SHAFTING

| | |
|-----------------|-------------|
| Boston district | 19.50-19.75 |
| New York | 20.00-20.50 |

| | |
|-------------------------|-------------|
| Eastern Pa. | 25.00-25.50 |
| St. Louis, 1 1/4-3 3/4" | 19.75-20.25 |

CAR WHEELS

| | |
|-----------------------|-------------|
| Birmingham, iron | 15.00 |
| Boston dist., iron | 11.50-16.00 |
| Buffalo, steel | 25.50-26.00 |
| Chicago, iron | 21.25-21.75 |
| Chicago, rolled steel | 23.50-24.00 |
| Cincin., iron deal. | 20.00-20.50 |
| Eastern Pa., iron | 22.50-23.00 |
| Eastern Pa., steel | 25.50-26.00 |
| Pittsburgh, iron | 22.00-22.50 |
| Pittsburgh, steel | 27.50-28.00 |
| St. Louis, iron | 20.50-21.00 |
| St. Louis, steel | 22.00-22.50 |

NO. 1 CAST SCRAP

| | |
|-----------------------------------|-------------|
| Birmingham | 17.00 |
| Boston, No. 1 mach. | 17.25-17.50 |
| N. Eng. del. No. 2 | 16.50-17.00 |
| N. Eng. del. textile | 20.50-21.50 |
| Buffalo, cupola | 19.00-19.50 |
| Buffalo, mach. | 20.00-20.50 |
| Chicago, agri. net. | 16.00-16.50 |
| Chicago, auto net. | 18.00-18.50 |
| Chicago, rail'd net | 17.25-17.75 |
| Chicago, mach. net. | 17.75-18.25 |
| Cincin., mach. deal. | 21.00-21.50 |
| Cleveland, mach. | 22.50-23.00 |
| Detroit, cupola, net. | 16.75-17.25 |
| Eastern Pa., cupola | 22.50-23.00 |
| E. Pa., No. 2 | 19.50-20.00 |
| E. Pa., yard fdry. | 20.00 |
| Los Angeles | 16.50-17.00 |
| Pittsburgh, cupola | 21.00-21.50 |
| San Francisco | 14.50-15.00 |
| Seattle | 14.50-16.00 |
| St. L., agri. mach. | 19.75-20.25 |
| St. L., No. 1 mach. | 20.50-21.00 |
| Toronto, No. 1 mach., net dealers | 18.00-18.50 |

HEAVY CAST

| | |
|-----------------------|-------------|
| Boston dist. break. | 15.50-15.75 |
| New England, del. | 17.00-17.50 |
| Buffalo, break | 18.00-18.50 |
| Cleveland, break, net | 16.50-17.00 |
| Detroit, auto net. | 17.00-17.50 |
| Detroit, break | 14.75-15.25 |
| Eastern Pa. | 21.50 |
| Los Ang., auto, net. | 13.00-14.00 |
| New York break. | 16.00-16.50 |

STOVE PLATE

| | |
|----------------------|-------------|
| Birmingham | 11.00-12.00 |
| Boston district | 13.50-14.00 |
| Buffalo | 17.00-17.50 |
| Chicago, net | 13.00-13.50 |
| Cincinnati, dealers | 12.75-13.25 |
| Detroit, net | 11.50-12.00 |
| Eastern Pa. | 18.50 |
| New York fdry | 13.50 |
| St. Louis | 14.50-15.00 |
| Toronto dealers, net | 12.00 |

MALLEABLE

| | |
|----------------------|-------------|
| New England, del. | 22.00-23.00 |
| Buffalo | 22.50-23.00 |
| Chicago, R. R. | 23.75-24.25 |
| Cincin. agri., deal. | 18.25-18.75 |
| Cleveland, rail | 24.00-24.50 |
| Eastern Pa., R. R. | 22.50-23.00 |
| Los Angeles | 12.50 |
| Pittsburgh, rail | 25.00-25.50 |
| St. Louis, R. R. | 21.00-21.50 |

Manganese Ore

| | |
|---|-------------|
| <i>Including war risk but not duty, cents per unit cargo lots</i> | |
| Caucasian, 50-52% | 54.00-55.00 |
| So. African, 50-52% | 54.00 |
| Indian, 49-50% | 50.00 |
| Brazilian, 46% | 50.00 |
| Cuban, 50-51%, duty free | 67.50 |

| | |
|--------------------|-------|
| <i>Molybdenum</i> | |
| Sulphide conc. lb. | 50.75 |
| Mo. cont., mines | |

Ores

| | |
|---------------------------------------|--------|
| Lake Superior Iron Ore | |
| Gross ton, 51 1/2 % | |
| 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 | 10.00 |
| 36-63%, contract | |
| Foreign Ore | |
| Cents per unit, c.s.f. Atlantic ports | |
| Manganiferous ore, 45-55% Fe., 6-10% | |
| Mang. | Nom. |
| N. African low phos | Nom. |

| | |
|---|---------------|
| Spanish, No. African basic, 50 to 60% | Nom. |
| Chinese wolframite, net ton, duty pd. | \$23.50-24.00 |
| Brazil iron ore, 68-69%, ord. | 7.50c |
| Low phos. (.02 max.) | 8.00c |
| F.O.B. Rio Janelro. | |
| Scheelite, imp. | \$25.00 |
| Chrome ore, Indian, 48% gross ton, c.f. | \$28.00-30.00 |

STEEL

Sheets, Strip

Sheet & Strip Prices, Pages 104, 105

Pittsburgh—Bookings have been running ahead of deliveries, resulting in building up fair backlogs in sheets and strip. Miscellaneous buying has been good. Releases on previous commitments from large buyers, including household equipment and automotive interests, have been fair. Most sources here expect reaffirmation of prices shortly, although there is no indication when the announcement may come. Galvanized sheet operations remain unchanged at 81 per cent.

Cleveland — Hot-rolled sheets, on which deliveries were most relaxed among flat-rolled products, experienced sudden and brisk demand after election, resulting in a highly sold-out condition. Some producers are out of the market for the rest of the year. Only two weeks ago deliveries could have been made in three weeks. Some producers can make best delivery on wide cold-rolled sheets, for late December. An unusual inquiry is for high carbon, high manganese strip for helmets, manufacture of which is hard on machinery.

Chicago—Sheet and strip mill schedules are congested as orders continue. Deliveries range well into next year and much tonnage is being booked for first quarter. Inquiries and orders are well diversified, and significantly are for normal manufacturing needs and not for national defense except indirectly.

Boston — More orders for narrow cold strip are being booked for delivery in first quarter at open prices. Mills are generally sold up for the remainder of the year and some current quarter tonnage will go over into next year. Consumers are pressing for delivery in addition to placing prospective business. Sheet buying is maintained with secondary distributors placing additional replacement volume.

New York — While some sheet sellers can still make deliveries within four weeks, most have little to offer for shipment over the remainder of the year. Consequently, the trade believes that the time is near when some producers, for the sake of the record, will formally open books for first quarter. No price changes are expected.

Philadelphia—Sheet backlogs continue to accumulate because of expanding consumption and forward orders. Deliveries have backed up further but buyers generally are protected on current needs by previous commitments. Many inquiries are appearing from fabricators of defense products. The marine corps quartermaster, Philadelphia, closes Nov. 22 on 4200 galvanized corru-



is nothing-
to sneeze at

THERE is a job *always waiting* for your crawler crane. So much in demand are these machines by department heads that some firms have found it necessary to route their machines from job to job. Here is a Northwest in the Evansville, Indiana plant of the Chrysler Corporation. This machine has saved as high as \$3,497.70 a year over previous methods employed. From unloading steel it progresses to handling scrap, borings and turnings, and finishes up on coal, doing odd lifting jobs in between.

Your Northwest Crawler goes anywhere—no expensive overhead systems, no tracks.

The expense of steam operations becomes a thing of the past. As with your trucks, operating expense stops when the engine stops. As these machines earn for others

so they will earn for you. A crane for every job—gasoline, Diesel, or electric. Let us give you more details.

**NEEDS NO
EXPENSIVE
TRACKS OR
OVERHEAD
EQUIPMENT**

NORTHWEST
THE CRANE THAT GOES ANYPLACE

NORTHWEST ENGINEERING CO.
1805 Steger Building, 28 East Jackson Boulevard
Chicago Illinois

Built in a
range of 18
sizes—4½ to
40 tons capacity



gated containers, 16 to 32 gallon capacity.

Buffalo—Contracts for 1941 delivery are becoming more numerous in sheets and strip as mills have little tonnage for this quarter. Diversified armament buying is more than taking up the slack appearing in a few minor consuming lines. Production holds around 85 per cent of capacity.

Cincinnati — Backlogs of sheet mills are growing steadily, under the influence of national defense demand and steady specifications from other sources. It is likely considerable tonnage awaits formal opening of books for first quarter. The opinion is held generally that prices will be reaffirmed. Delivery problems, though aggravated by priorities, are not yet serious.

St. Louis—Sheet and strip demand continues to broaden, with defense requirements figuring more prominently. Priorities have not interfered with the regular flow of customer deliveries. According to producers most current materials being shipped to customers is apparently going into production.

Birmingham, Ala.—While current bookings of sheets and strip, particularly sheets, have shown some inclination to ease off, sufficient tonnage is on hand to maintain steady production for weeks, with backlog for the new year. Strip is being turned out in nominal quantity only.

Toronto, Ont. — Miscellaneous purchases by electrical trades and others engaged in peace-time production, with large tonnage orders from automotive industry and other war requirements, are stimulating sheet sales. Mills are accepting orders for delivery into second quarter, reporting no sheets available for delivery this year on new order account.

Plates

Plate Prices, Page 104

Pittsburgh—Backlogs continue to mount, with new defense business developing on all sides. Local mills are far behind on deliveries, and in some cases are unable to supply estimates as to when deliveries could be expected, particularly on wide material.

Cleveland — February is the earliest delivery possible on wide or heavy plates, a commodity which is in the class with shapes, bars and structurals for tightness. To replace, repair and augment the Great Lakes fleet, which suffered in the recent storm, large tonnages of plates will be needed. Jobbers are among those most anxious for plates for prompt delivery.

Chicago—With the heavy con-

struction industry booked to near full capacity for weeks, mills are unable to keep shipments of plates abreast of orders. Deliveries are lengthening and no signs of easing are in sight. Warehouse sales of plates are better than for some time.

Boston — Shipyard specifications are outstanding in plate demand with miscellaneous orders tending heavier. Boiler shops are placing more orders and tank requirements for army camps are mounting. Railroads are placing orders for maintenance only. Deliveries on wider plates and alloys are lengthening.

New York—The first real wave of plate specifications against the heavy ship distribution made by the navy in September, involving 200 vessels, is expected to appear in January, and to complicate an already bad delivery situation. Even though specifications against this huge program will be released over a period of several years, with much to be added to shipbuilding facilities before the work can be put under full swing, initial specifications are expected to be heavy. Except for universal plates, which are still available in three to four weeks, little plate tonnage is now available before the end of this year, and in the case of the wide sizes, little can be had before eight or nine weeks. Particularly in view of this situation, early action in the formal opening of books for first quarter is expected, with prices in all probability to be reaffirmed.

Philadelphia—Some producers will accept light narrow plate business for December, with January earliest for heavy material. Demand is widely spread, best outlets being shipyards, railroads, various types of tank fabricators and equipment builders. Floor plates are active, aided by brisk export demand.

Birmingham, Ala. — Plates are being booked in substantial volume, although hardly equal to the tonnage of a few weeks ago. Deliveries are still considerably delayed, and sufficient tonnage is on books for an indefinite period.

Seattle—Shipbuilding has developed acute demand for plates. Some delay in shipping larger orders is reported. Large tonnages are to be placed in the near future. Smaller shops report an improved volume of business in jobs involving 20 to 50 tons each.

San Francisco—Plate bookings aggregate 5645 tons and brought the total to date to 183,911 tons, compared with 90,326 tons for the corresponding period in 1939. General Engineering & Drydock Co. secured 3200 tons for four mine sweepers for the navy.

Toronto, Ont. — Plate demand is well sustained, with practically all orders for delivery this year going to United States producers. Can-

adian mills are fully booked for several months. Plans are under way for building number of large cargo vessels for Great Britain in Canada which will have stimulating effect on plate demand early next year. More extensive warship construction also is under consideration for which plate will be required, as well as for war tank work.

Plate Contracts Placed

- 3200 tons, four mine sweepers for navy, to General Engineering & Drydock Co., Alameda, Calif.
- 1500 tons, oil tanks, Richfield Oil Co., Seattle, Wash., to Chicago Bridge & Iron Works, Chicago.
- 1445 tons, ten steel coal barges, Leetsdale, Pa., to Dravo Corp., Pittsburgh.
- 350 tons, 500,000-gallon tank and tower, Elemendorf Field, Alaska, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 250 tons, including 75 tons shapes, navy lighter, to Bethlehem Steel Co., Seattle; Associated Shipbuilders, Seattle, general contractor.
- 215 tons, punched plates, Baltimore, to Central Iron & Steel Co., Harrisburg, Pa.
- 150 tons, welded buoys, Philadelphia, to Acme Steel Co., Chicago.
- 115 tons, buoys, Sewalls Point, Va., to Acme Steel Co., Chicago.
- 100 tons, 200,000-gallon tank and tower, Hill Field, Utah., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 100 tons, 200,000-gallon tank and tower, March Field, Calif., to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- Unstated, ore pots for additional unit Alcoa plant, Vancouver, Wash., to Steel Tank & Pipe Co., Portland.
- Unstated tonnage, two elevated steel water tanks, Fort Story, Va. and state rifle range, Virginia Beach, Va., to W. E. Caldwell Co., Louisville, Ky.; Inv. 6174-40, bids Nov. 9.

Plate Contracts Pending

- 2900 tons, 12 to 42-inch, welded steel pipe, San Diego, Calif.; bonds voted for \$1,300,000 and bids are expected to be called soon.
- 150 tons, 30-in. welded steel pipe, Spokane, Wash.; bids Nov. 21.

Tin Plate

Tin Plate Prices, Page 104

Pittsburgh—No change has been noticed in tin plate, operations holding steady at 44 per cent of capacity. So far as can be learned, negotiations on contracts for 1941 have not yet been completed. According to custom, there will be no price announcement until these negotiations have been finished, but best advance information indicates reaffirmation of the current price.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 105

Demand is exceedingly strong, with November sales in better volume than last month. Buying is well diversified. On stock goods fairly prompt deliveries can still

be promised. Good demand for defense projects, such as tanks, trucks and ships, begins to appear in volume.

Bars

Bar Prices, Page 104

Pittsburgh—Backlog in merchant bars is moving up and mills are well loaded. Deliveries have begun to drop behind, although the situation is not serious. However, it is virtually impossible to get immediate delivery on orders being placed now.

Cleveland — Deliveries have been extended further to ten to twelve weeks. Some producers report sales of bars and other steel items 20 per cent better than a month ago; others find business unchanged. At least three northern Ohio makers are working on shell steel contracts.

Chicago — Situation for steel bars becomes tighter week by week, as orders are unabated and deliveries more extended. Orders are now being booked for February and March shipments. Alloy and carbon grades are in chief demand, with purchasers pressing for delivery ahead of schedule. Buying is well distributed by industries, with automotive, farm implement and forging makers in the lead.

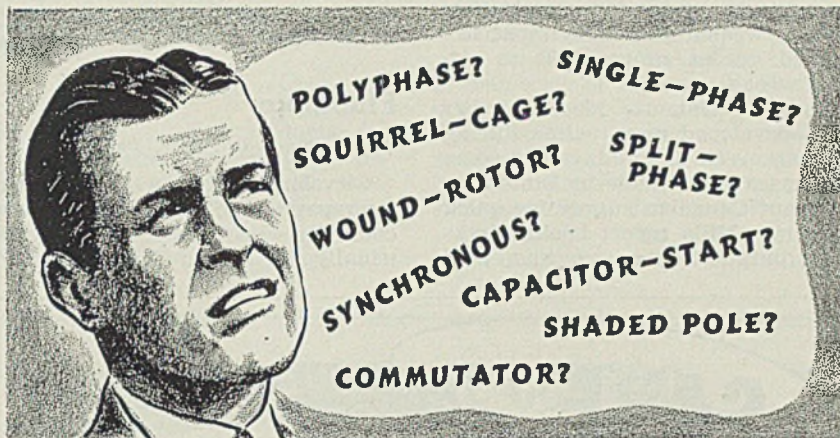
Boston — Although well covered with protective orders, bar consumers continue to press for deliveries, notably alloys, with more spot volume being placed as defense program needs increase. Consumption tends upward steadily, including bolts and nuts, small tools, shipyards and chain-making. Demand is broadening with machine tool builders placing replacement orders in some instances.

New York—Most bar sellers have little to offer for shipment over the remainder of the year. Small rounds and flats can be had during the latter part of December, but larger rounds, particularly two inches and larger, are difficult to obtain much under eight to ten weeks. Exceptions are few. Cold-drawn carbon bar shipments average a week to two weeks more extended than on hot carbon bars. Alloy bar deliveries range around 15 weeks and in some instances longer; and where specially heat treated, deliveries run well into second quarter.

Philadelphia — Consumers and warehouses are seeking to enlarge stocks in anticipation of heavier requirements. Mills are able to accumulate little additional business the remainder of this quarter, being completely sold out on some sizes until next period. Specifications are steadily being entered against

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blanket commitments for first quarter.

Buffalo — Additional forward covering is expanding bar backlogs. Diversified industrial demand is coupled with pressure by warehouses. Extensions on common open hearth grades range from four to six weeks and alloy specially treated grades range eight to sixteen weeks.

Toronto, Ont. — Merchant bar sales developed more action during the past week or ten days and some purchases were made in Buffalo to augment Canadian supply for quick delivery. Mills report booking covering output to the year end, with

orders pouring in from the automotive industry and a variety of other sources.

Birmingham, Ala. — Bar production, while steady at close to 90 per cent, is hardly on a par with plates and shapes. As heretofore, concrete reinforcing constitutes most bar bookings.

Fluorspar

Fluorspar Prices, Page 106

Cleveland—Exports of American fluorspar to India and other foreign countries are reported, whereas usually the United States is an im-

porting nation. The Tata Iron & Steel Co. is reported one of the Indian purchasers. Kentucky and Illinois producers are said to be speeding up in anticipation of brisk demand and a tight supply. The market is decidedly stronger, with quotations on washed gravel and No. 2 lump \$20 to \$21 per net ton.

Pipe

Pipe Prices, Page 105

Pittsburgh—Railroad buying of pressure tubing has gained somewhat. Demand for standard pipe continues to exceed the immediate supply and the cushion of stocks held at consignment points is running low. Mechanical tubing releases from various manufacturers have been good, but there is no sign of improvement in oil country business.

Cleveland—Sales of merchant pipe continue at a better rate than shipments and beyond all expectations, with evidences that it will continue for many weeks. Deliveries are more extended.

Boston — Resale pipe prices are steadier, with mills firmer on replacement tonnage. Demand for merchant pipe is somewhat above normal for this season, due to considerable emergency construction. Prospective requirements for housing are substantial. Considerable pipe is also going into shipbuilding. Cast pipe demand has slackened with requirements for cantonment work generally covered.

Seattle—Market conditions have improved, demand is heavier and sales from warehouse stocks are more numerous. About 750 tons are pending for system improvements at Seattle and Everett, general contracts placed.

San Francisco—Movement of cast iron pipe in small lots is heavy, though few inquiries of size have developed recently. Awards aggregated 345 tons and brought the total to date to 42,385 tons, compared with 35,368 tons for the corresponding period in 1939.

Steel Pipe Placed

3410 tons, welded pipe, DeKalb county, Georgia, to American Rolling Mill Co., Middletown, Pa.

Steel Pipe Pending

Unstated, 4800 feet 30-inch, also accessories, for Spokane, Wash.; bids Nov. 21.

Unstated, 4950 feet 3 and 4-inch, King county district No. 56, Seattle; bids to Joe O'Brien, secretary, Nov. 21.

Cast Pipe Placed

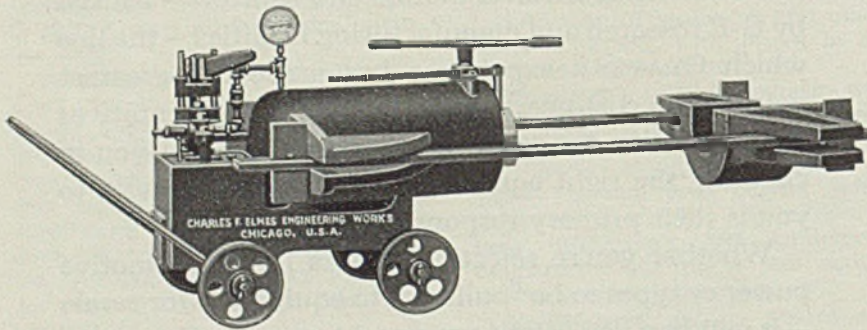
200 tons, 16-inch, Alameda, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

129 tons, 10-inch, Arcadia, Calif., to

STEEL

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United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

460 tons, 6 to 12-inch, Myrtle street extension, Seattle; Argentieri & Colarosso, Seattle, general contractors.

135 tons, two system expansion projects, Everett, Wash.; Hugh G. Purcell, Seattle, low.

130 tons, 6-inch, Sacramento, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

Rails, Cars

Track Material Prices, Page 105

Railroad buying continues at moderate rate and heavy expected rail requirements for 1941 work have not appeared. New York, New Haven & Hartford has placed 15,000 tons, award of accessories yet to be made. Louisville & Nashville is in the market for 3600 cars, Wheeling & Lake Erie for 415 cars, and St. Louis Southwestern has asked court permission to buy 400 cars.

Builders are only moderately busy, although cars placed this year far outnumber those awarded last year.

Locomotives Placed

Brazilian and Bolivian governments, four mogul-type locomotives, to Vulcan Iron Works, Wilkes-Barre, Pa., for operation between the two countries.

Rail Orders Placed

New York, New Haven & Hartford, 15,000 tons, reported placed; distribution of accessories is expected shortly.

Car Orders Placed

Denver & Rio Grande Western, 500 box cars, to Pressed Steel Car Co., Pittsburgh.

Car Orders Pending

Louisville & Nashville, 3000 hoppers, 500 gondolas and 100 box cars; bids asked.

St. Louis Southwestern, 400 cars; 50 flat, 50 gondolas, 100 fifty-foot box, 200 forty-foot box; court permission asked.

Wheeling & Lake Erie, 415 freight cars; 300 box, 65 hopper and 50 flat cars.

Buses Booked

A.c.f. Motors Co., New York: Ten 31-passenger for Safety Motor Transit Corp., Roanoke, Va.; ten 39-passenger and one 37-passenger for Alexandria, Barcroft & Washington Transit Co., Alexandria, Va.; seven 29-passenger for Virginia Stage Lines, Charlottesville, Va.; four 31-passenger for Philadelphia Transportation Co., Philadelphia; four 33-passenger, two 37-passenger and two 29-passenger, for Florida Motor Lines Corp., Jacksonville, Fla.; three 29-passenger for Sunshine Bus Lines Inc., Dallas, Tex.; six 33-passenger for Edwards Motor Transit Co. Inc., Williamsport, Pa.; two 29-passenger for Denver-Salt Lake-Pacific

Stages Inc., two 29-passenger for Edwards Motor Transit Co. Inc., New Haven, Conn., one 37-passenger and one 22-passenger, for Fitchburg & Leominster street Railway Co., Fitchburg, Mass.; two 37-passenger for Bowen Motor coaches, Fort Worth, Tex.,

Wire

Wire Prices, Page 105

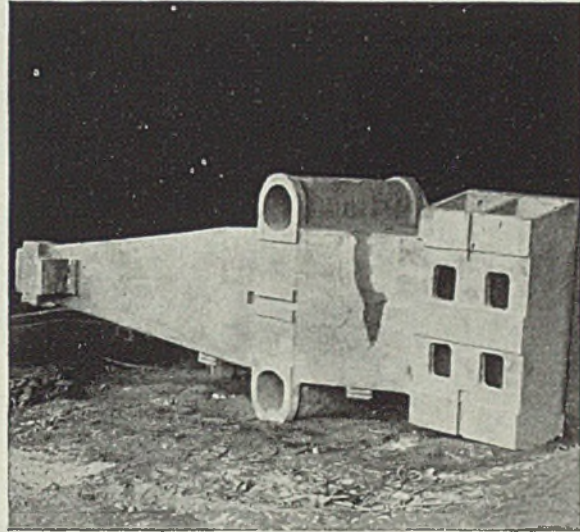
Pittsburgh — Wire products deliveries, particularly specialties, are running farther behind, with considerable volume of new business being placed. Pressure is heaviest in manufacturers' wire items, al-

though there has been good interest in merchant products and jobber buying has been heavy. Deliveries on many items are well into first quarter, and most buyers have been reassured that prices will remain unchanged.

Cleveland—A producer who makes a wide variety of products reports wire products as the most belated in deliveries of all, usually 90 days being the best promised. The active building program is taking nails, with automobile makers and general manufacturers buying wire. Prices are the firmest in years.

Chicago — Wire products continue in strong demand with a heavy

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volume of new business and consumers pressing for deliveries. Mill backlogs are substantial and deliveries more extended. Producers note a sharp increase in orders for valve spring wire since Swedish wire of this grade is no longer available.

Boston — Orders reaching wire mills continue in excess of shipments in most instances. Demand is widely diversified, including a wide range of specialties and manufacturers' wire. Rope mills are making little progress in reducing backlogs and are being pressed for deliveries. The same applies to spring wire and electrical goods, some of

the latter contracts for government supply being on priority.

Shapes

Structural Shape Prices, Page 104

Pittsburgh — Tonnage has declined slightly in industrial inquiry, although there is still a good volume of unplaced business. Suppliers here are of the opinion the bulge is past, with a substantial part of the construction necessary to get the defense program under way already placed. Deliveries con-

tinue to run 60 to 90 days and farther than that in some cases. Pressure remains heaviest in large sections.

Cleveland — Structural continue one of the three or four items in most demand. Producers expect that within six months business will abate somewhat, when buying will shift to other products. Much of the business is due to peace time expansion due to high industrial operations and employment.

Chicago — Structural fabricators are working at top speed and finding it difficult to obtain an even flow of material from mills. All shape rolling facilities in the district are booked for weeks ahead and taking orders only for first quarter. Government construction predominates, although no new inquiries of size are out for figuring at the moment.

Philadelphia — Fabricated shape awards are small but several large lots are pending, including 3000 tons for shipways and 1500 tons for a turret shop for the New York Shipbuilding Corp. Shape deliveries average close to eight weeks, with some special sections further extended.

Seattle — Demand for shapes is exceptionally active and fabricating shops are operating full. Heavy construction projects indicate additional large contracts in the near future. The week's awards include 5000 tons to Bethlehem Steel Co. for an addition to the Alcoa plant, Vancouver, Wash., and 1145 tons for two Washington state bridges to the Missouri Valley Bridge & Iron Co., Kansas City, Mo.

San Francisco — Demand for structural shapes continues strong. Bids have been taken on 5500 tons for seven warehouses at Hill Field, Utah. Bids have also been opened on 200 tons for a chemistry building for the University of Nevada, Reno.

Toronto, Ont. — While structural steel awards are below the October and September high records, volume is well above most former years. War construction projects call for large tonnages, with some 10,000 tons pending.

Shape Contracts Placed

5000 tons, addition to Alcoa plant, Van-

Shape Awards Compared

| | Tons |
|--------------------------------------|-----------|
| Week ended Nov. 16 | 29,373 |
| Week ended Nov. 9 | 28,000 |
| Week ended Nov. 2 | 37,890 |
| This week, 1939 | 18,736 |
| Weekly average, year, 1940 | 28,394 |
| Weekly average, 1939 | 22,411 |
| Weekly average, Oct. | 48,298 |
| Total to date, 1939 | 1,043,645 |
| Total to date, 1940 | 1,306,129 |
| Includes awards of 100 tons or more. | |

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1940

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New Brighton, Pa.
(Pittsburgh District)

cover, Wash., to Bethlehem Steel Co., Seattle.

3615 tons, bridge, Mississippi river, Chester, Ill., to American Bridge Co., Pittsburgh.

1600 tons, four mine sweepers for navy, to General Engineering & Drydock Co., Alameda, Calif.

1500 tons, depot supply building, war department, Duncan Field, San Antonio, Tex., to Mosher Steel Co., Houston, Tex.

1210 tons, powerhouse and plant addition, Plymouth, Mich., to Wisconsin Bridge & Iron Co., Milwaukee.

1200 tons, two bridges, Wake Island, to Columbia Steel Co., San Francisco.

1060 tons, miscellaneous buildings, Edgewood arsenal, Maryland, to Belmont Iron Works, Eddystone, Pa.

1000 tons, state span Spokane river, Washington state, to Missouri Valley Bridge & Iron Co., Kansas City, Mo.; C. & F. Teaming & Trucking Co., Butte, Mont., general contractor.

955 tons, Los Angeles junction railroad bridge, Los Angeles, to Columbia Steel Co., San Francisco.

875 tons, office and store building, Schenectady, N. Y., to American Bridge Co., Pittsburgh.

870 tons, state project No. 6234, Dunn county, Wisconsin, to Milwaukee Bridge Co., Milwaukee.

650 tons, factory building for Bendix-Westinghouse company, Elyria, O., to R. C. Mahon Co., Detroit.

610 tons, addition, St. Vincent's hospital, New York, to Harris Structural Steel Co., New York.

535 tons, mess hall, project No. 15, Quonset Point, R. I., to Harris Structural Steel Co., New York.

518 tons, undercrossing Santa Fe tracks, Arcadia, Calif., to Columbia Steel Co., San Francisco.

500 tons plus, six substations for Bonneville project, to Bethlehem Steel Co., Seattle.

500 tons, engine repair building, war department, Duncan Field, San Antonio, Tex., to Mosher Steel Co., Houston, Tex.

475 tons, health center, West Virginia, to L. Schreiber Sons Co., Norwood, O.

405 tons, air corps hangar, Fort Knox, Ky., to Hansell-Elcock Co., Chicago.

400 tons, two 250-ton overhead traveling cranes, Central Valley project, Coram, Calif., to Lakeside Bridge & Steel Co.

300 tons, building, Plastic Mfg. Co., Dayton, O., to Burger Iron Co., Akron, O.

300 tons, ash tower 1, for Consolidated Edison Co., New York, to American Bridge Co., Pittsburgh.

300 tons, machine shop addition, American Chain Co., Pennsylvania, to Reading Metalcraft Co., Reading, Pa.

300 tons, naval buildings and accessories, Washington, to Pittsburgh-Des Moines Steel Co., Pittsburgh; Charles H. Tompkins Co., Washington, contractor; Rosslyn Steel & Cement Co., Washington, awarded reinforcing steel.

280 tons, addition, Foster-Wheeler Corp., Carteret, N. J., to Belmont Iron Works, Eddystone, Pa.

280 tons, naval towers, naval academy, Annapolis, Md., to Weatherly Steel Co., Weatherly, Pa., through Vanguard Construction Co., New York.

270 tons, McCrory store, York, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.; also 120 tons, joists, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, air corps shop building, Barksdale Field, La., to Mississippi Steel & Iron Co. Inc., Jackson, Miss.; Glassell & Taylor, Shreveport, La., contractor; J. B. Beard Corp., Shreveport, awarded reinforcing bars.

250 tons, factory, Louis Marx Co., Girard, Pa., to R. S. McMannus Steel Construc-

tion Co. Inc., Buffalo; Gilmore, Carmichael & Olsen, Cleveland, general contractor.

230 tons, ore dock spouts, etc., Allouez, Wis., for Great Northern railway, to American Bridge Co., Pittsburgh.

230 tons, post office, Charleston, W. Va., to Ingalls Iron Works, Birmingham, Ala.; T. G. Egan Engineering-Refractory Co., Brooklyn, contractor.

215 tons, state highway bridge, Table Rock, Neb., to Omaha Steel Works, Omaha, Neb., bids Oct. 31.

210 tons, building, Edo Aircraft company, College Point, N. Y., to Grand Iron Works Inc., New York.

210 tons, library, Harvard university, Cambridge, Mass., to A. L. Wilson Structural Co., Cambridge, Mass.

205 tons, mill building, Franklin, Pa., to Truscon Steel Co., Youngstown, O.

200 tons, addition, Ducommun Metal & Supply Co., Los Angeles, to Consol-

idated Steel Corp., Los Angeles.

200 tons, building addition, Wright field, Dayton, O., to Burger Iron Co., Akron, O.

200 tons, Seattle transportation commission garage and shops, to Wisconsin Bridge & Iron Co., Milwaukee; Gjarde Construction Co., Seattle, general contractor.

185 tons, plant addition, Detroit, to R. C. Mahon Co., Detroit.

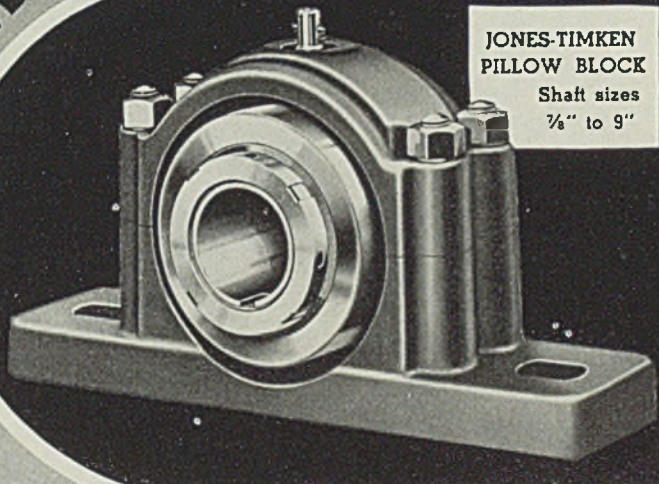
185 tons, machine shop extension, Chester, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

180 tons, addition, Bell Telephone Co., Norfolk, Va., to Bethlehem Fabricators, Bethlehem, Pa.

160 tons, dispensary, project No. 31, Quonset Point, R. I., to Belmont Iron Works, Eddystone, Pa.

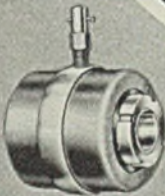
145 tons, state bridge Chelan county, Washington, to Missouri Valley Bridge & Iron Co., Kansas City, Mo.; C. & F.

STAMINA, INC.




**JONES-TIMKEN
PILLOW BLOCK**

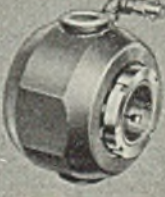
Shaft sizes
1/4" to 9"



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Shaft sizes 1 1/2" to 3 1/2"

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CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES
ANTI-FRICTION PILLOW BLOCKS • PULLEYS
FRICTION CLUTCHES • TRANSMISSION APPLIANCES

Teaming & Trucking Co., Butte, Mont., general contractor.
 140 tons, mold loft, Orange, Tex., to Consolidated Steel Corp., Los Angeles.
 125 tons, Caney creek bridge, Harriman, Tenn., for Tennessee valley authority, to American Bridge Co., Pittsburgh.
 120 tons, construction contract No. 389-6-2, Galveston county, Galveston, Tex., to Maxwell Steel Co., Fort Worth, Tex.
 115 tons, Y. W. C. A. addition, Harrisburg, Pa., to Reading Steel Products Co., Reading, Pa.
 100 tons, East addition, hospital and administration building, Mall, Washington, to Barber & Ross Co., Washington; C.M.H. Co., Washington, contractor; Hudson Supply & Equipment Co., Washington, awarded reinforcing bars.

Shape Contracts Pending

20,000 tons, high level deck truss bridge,

Thames river, New London, Conn.; bids next month.
 12,500 tons, Fairhaven Village Inc., Buffalo, piling included; project includes nine apartment houses; additional 1100 tons will be required for garage.
 8000 tons, transm'ss'ion towers, Grand Coulee dam, Washington; bids Nov. 25.
 8000 tons, factory buildings, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
 5000 tons, elevated highway sections, approaches Brooklyn-Battery tunnel, Brooklyn side, contracts B-13 and B-15; bids Nov. 29.
 4000 tons, seven warehouses, Ogden, Utah, for government.
 4000 tons, assembly shop, Hunters Point drydock, San Francisco; bids Nov. 20.
 3000 tons, plus unstated tonnage piling, rehabilitation of shipways, New York Shipbuilding Corp., Camden, N. J.

3000 tons, cracking towers, Bayonne, N. J., Baton Rouge, La., and Baytown, Tex., for Standard Oil Co. of New Jersey.
 1931 tons, Missouri highway bridges: St. Louis county, 1241 tons; Wayne county, 437 tons and six others, 260 tons; bids Nov. 19.
 1800 tons, manufacturing building, for Danley Machine Specialties Co., Cicero, Ill.
 1500 tons, turret shop, New York Shipbuilding Corp., Camden, N. J., Leonard Shaffer, Philadelphia, contractor; bids Nov. 19.
 1500 tons, air corps hangar No. 1 and flight hangars No. 1, 2, and 3, Howard Field, C. Z.; N. P. Severin Co., 222 West Adams street, Chicago, low on general contract at \$1,869,976.
 1210 tons, 898 steel towers, stubs, anchors and specials, Coulee-Puget Sound transmission line; bids to Bonneville project, Portland, Oreg., Nov. 25.
 700 tons, hospital building, for Hartford hospital, Hartford, Conn.
 450 tons, factory building, for Dow Chemical Co., Bay City, Mich.
 375 tons, bridge, Bakersfield, Calif., for state.
 350 tons, alterations to craneways, Philadelphia, for government.
 315 tons, power house, for Hercules Powder Co., Parlin, N. J.
 300 tons, four buildings, naval supply depot, Oakland, Calif., specification 10111; bids Nov. 27.
 285 tons, pedestrian overpass, contract E-6, Brooklyn, N. Y., for Triboro bridge authority.
 265 tons, generator house, for Elizabethtown Consolidated Gas Co., Elizabeth, N. J.
 235 tons, shell assembly plant, Edgewood, Md., for government.
 200 tons, shipping building, for Wyman-Gordon Co., Worcester, Mass.
 150 tons, warehouse for Steel Products Engineering Co., Springfield, O.; bids in
 135 tons, mezzanine stations, subway, contract S-10-E, Chicago.
 120 tons, extension 7, paper machine building, for Nekoosa-Edwards Paper Co., Port Edwards, Wis.
 110 tons, addition, artillery shell shop, building 55, Philadelphia, for army.

Reinforcing

Reinforcing Bar Prices, Page 105

Pittsburgh — A new buying wave has stiffened prices. Tendency in this section is to bring rail bars to a parity with billet steel, although few contracts have been let on that basis. Apparently normal seasonal factors will have little effect on the market this winter.

Chicago — Sudden arrival of severe cold weather may slow construction. Mills are in a position to handle additional tonnage, held back by inability of engineering departments to provide specifications.

Philadelphia — Reinforcing orders are mainly for lots under 100 tons, but shipments are heavy, with considerable business still in prospect. While prices are not rigid the market has strengthened materially the past 60 days. When not available

NEWPORT PRODUCTS

Hot Rolled Sheets • Newport Electrical Sheets • GOHI Pure Iron-Copper Alloy Sheets • Globe Brand Galvanized Steel Sheets, Roofing and Siding • GOHI Enameling Iron Sheets • KCB Copper Steel Sheets • Newport Long Terne Sheets • Newport Galvannealed and Deluxe Metal Sheets.

LEADING enamelers quickly recognize the outstanding superiorities of GOHI Enameling Iron and the many production advantages made possible through its use, with the result that this fine metal is accorded top rating by those who demand the utmost in performance, whose manufacturing facilities are geared up to highest operating efficiency.

GOHI Enameling Iron is metallurgically pure, free from grease and pickle marks. The smooth, satiny surface holds the enamel tightly — many common enameling troubles are eliminated, and the appearance and longevity of the finished product are immeasurably improved.



ANDREWS PRODUCTS IN CARBON AND ALLOY STEEL: Bars • Plates • Universal Mill Plates • Sheet Bars • Billets • Blooms • Slabs

from stock, deliveries are five to seven weeks.

Seattle—Small tonnages are numerous and are increasing rolling mill backlogs. Prices are firm and demand is active. Plants are operating to capacity. Merchant bars are moving in steady volume. Business pending includes 800 tons for Washington state highway projects, bids Nov. 19.

Reinforcing Steel Awards

- 1600 tons, seven additional hangars, Gravelly airport, Washington, to Bethlehem Steel Co., Bethlehem, Pa., through John McShain Inc., contractor.
- 1400 tons, Panama Canal, schedule 4450, to Bethlehem Steel Co., Bethlehem, Pa.
- 1000 tons, navy yard supply piers, Norfolk, Va., to Bethlehem Steel Co., Bethlehem, Pa., through McLean Construction Co., contractor.
- 500 tons, United States army cantonment, Fort Meade, Md., to Bethlehem Steel Co., Bethlehem, Pa., through Consolidated Engineering Co., contractor.
- 500 tons, aircraft engine plant, Ford Motor Co., Dearborn, Mich.; Bryant & Detwiler, contractors; Ford to furnish and fabricate concrete bars.
- 400 tons, West Rich street housing project, Columbus, O., to Truscon Steel Co., Youngstown, O., through Henke Construction Co., contractor.
- 325 tons, highway projects, RC-40-87, Westchester county, and RC-40-97, Dutchess county, New York, to Wickwire Spencer Steel Co., New York; John Arborio Inc., Poughkeepsie, N. Y., contractor.
- 300 tons, Edgewood housing, Akron, O., to Truscon Steel Co., Youngstown, O., through Lloyd Bros. Inc., contractor.
- 300 tons, Swanson homes housing project, Portsmouth, Va., to Truscon Steel Co., Youngstown, O., through William Multhead Construction Co., contractor.
- 300 tons, Edgewood arsenal, additional improvements, Harford County, Va., to Bethlehem Steel Co., Bethlehem, Pa., through Cummins Construction Co., contractor.
- 290 tons, East River drive, contract 33, New York, to Truscon Steel Co., Youngstown, O., through DiMenna & Sons, contractors.
- 270 tons, Pine Camp Barracks, Watertown, N. Y., to Truscon Steel Co., Youngstown, O.; John W. Cowper Co. Inc., Buffalo, general contractor.
- 225 tons, highway project RC-40-84, Cayuga county, New York, to Wickwire Spencer Steel Co., New York; Mohawk Paving Co. Inc., Buffalo, contractor, \$198,642.40; bids Oct. 16, Albany.
- 200 tons, Northern Pump Co. plant, Min-

neapolis, to Truscon Steel Co., Youngstown, O., through G. F. Cook Construction Co., contractor.

- 200 tons, light fixture plant, Westinghouse Electric & Mfg. Co., Cleveland, to Truscon Steel Co., Youngstown, O., through Austin Co., contractor.
- 200 tons, Hercules Powder Co. plant, Belvidere, N. J., to Bethlehem Steel Co., Bethlehem, Pa., through Bechtel-McCone-Parsons, contractor.
- 150 tons, naval torpedo station improvements, Newport, R. I., to Bethlehem Steel Co., Bethlehem, Pa., through Tredennick-Billings, contractor.
- 140 tons, bridge, Orange, Conn., to Truscon Steel Co., Youngstown, O.; Mariani Construction Co., New Haven, contractor.
- 130 tons, service parts building, Chevrolet Motor Co., Saginaw, Mich., to Truscon Steel Co., Youngstown, O.,

through O. W. Burke Co.


- 130 tons, warehouse, Warren Telechron Co., Ashland, Mass., to Joseph T. Ryerson & Son Inc., Chicago, through J. W. Bishop Co., contractor.
- 120 tons, low rent housing project No. Illinois 18-1, Rock Island, Ill., to Bethlehem Steel Co., Bethlehem, Pa.
- 100 tons, WPA sewer, southwest side, Chicago, to Concrete Steel Co., Chicago.

Reinforcing Steel Pending

- 2927 tons, Panama Canal, schedule 4506.
- 2000 tons, TNT plant, E. I. du Pont de Nemours & Co., Wilmington, Del.; Stone & Webster, engineers and contractors.
- 1300 tons, Curtiss-Wright Corp. expansion, Cheektowaga, N. Y.; bids Nov. 8.

Peaking of helpful literature

it will interest you to know that we have prepared two interesting bulletins concerning bearings and bearing metals. These booklets tell of the requirements of a bearing metal, the research work of the late A. W. Cadman; properties, tests and selection of the proper Babbitt metal, etc. In the event that you care to examine a little semi-technical data and look over a digest of 80 years' pioneer work in the development of fine bearing metals, we suggest that you clip the attached coupon and mail it to us. Your bulletins will be forwarded to you immediately. We believe you will find them helpful and instructive.



**A. W. CADMAN
MANUFACTURING
CO., PITTSBURGH**

Concrete Bars Compared

| | Tons |
|----------------------------------|---------|
| Week ended Nov. 16 | 8,780 |
| Week ended Nov. 9 | 6,344 |
| Week ended Nov. 2 | 10,936 |
| This week, 1939 | 7,849 |
| Weekly average, year, 1940 | 9,602 |
| Weekly average, 1939 | 9,197 |
| Weekly average, Oct. | 12,417 |
| Total to date, 1939 | 453,165 |
| Total to date, 1940 | 441,670 |

Includes awards of 100 tons or more.

A. W. CADMAN MANUFACTURING CO.
2816 Smallman St., Pittsburgh, Pa.

Gentlemen: Please send me your two interesting bulletins "BEARINGS & BEARING METALS" and "CADMAN METALS". I understand there is no obligation—that these bulletins are reference works.

NAME:

COMPANY:

ADDRESS:

Behind the Scenes with STEEL

Frankenstein

■ I. Q. tests for weeding out the unfit applicants for machine tool jobs are a swell idea so long as you don't make the mistake a bunch of college professors recently made over east. They couldn't pass their own quizzes.

More I. Q.

■ To get at the same problem Lockheed Aircraft has devised a psychology quiz for rating of job applicants and all you have to do is quiz your man, then graph the following characteristics: *Hysteroid, Manic, Autistic, Paranoid, Epileptoid*. Then it's every man for himself.

Old Copies Wanted

■ We hope one of our old-time subscribers will be able to help out Edmund E. Johnston of Saginaw, Mich., who is most anxious to get a half-dozen issues of *Iron Trade Review*, as STEEL was known then, for the year 1898. If you have a loose file back that far, will you let us know? Ours are all in bound volumes.

Slogan Snapper

■ One hobbyist we know keeps his Leica busy snapping snappy slogans. He says dry cleaners are the greatest punsters, for example: *Milli-kin Clean It . . . We'll Clean It Or Dye . . . Come Clean With Me and I'll Dye For You*. Favorite among truckers was "You Call—We Haul." One that he couldn't photograph was the Chinese laundry truck with the trick horn that plays *This Is The Way We Wash Our Clothes*.

And He Meant It!

■ Speaking of slogans, there is the story still told around the office here of one hard-working and conscientious young chap on the staff of our contemporary magazine, *The Foundry*, a few years ago. Of all the things *The Foundry* could be justly proud, one in particular has always been their pertinent descriptive slogan which adorns all of their stationery, cards, promotion pieces, etc. *Wherever*

Metals Are Cast, You'll Find The Foundry. As we get it, one day our hero's eyes widened, his heart stepped up a beat and with bubbling enthusiasm he rushed in to the boss and said he had an idea. An idea, he says, for a slogan for *The Foundry*. And what is it, says the boss, thinking to himself it would have to be good to replace the old standby. Well, by now you've probably guessed what our hero said. That's right, he stood there in all earnestness and suggested line-for-line the same slogan that had been right under his nose every day he came to work!

Prize Winner

■ We learn that the Bantam Bearings advertisement, "Space Savers," which appeared in STEEL's July 22 issue has been selected by the Dartnell Corp. as one of the best trade paper advertisements of the year.

Alter Ego

■ Speaking of advertisements, a belated orchid for Lincoln Electric's clever use of the Strange Interlude idea in their "Alter Ego" series. When our other self starts in lecturing us (particularly after one of those bad nights), we could hardly use his comments in print.

Idea Dept.

■ If you are wondering what to do at your next trade show exhibit, here's a novel and by no means overexploited way of showing your prospects "how it works." Use a transparent mirror or Belgian mirror (if you can buy one!), set at a 45 degree angle in a shadow box. Then with the aid of a double-dissolving rheostat the equipment can be made to fade gradually from view, while the "hidden feature" slowly makes its appearance. Finally, the equipment fades out completely, leaving only the single feature which you wish highlighted. Then the process is reversed, and the cycle repeated. A motor and cams, plus light, do the trick but we suggest you don't try to build this yourself.

SHRDLU.

- 1100 tons, warehouse, Belvedere Corp., Lawrenceburg, Ind.
- 563 tons, Panama Canal, schedule 4524.
- 560 tons, Maritime training school, Hueneme, Calif.; general contract to Zoss Construction Co., 1015 West Fourth street, Los Angeles at \$480,500.
- 400 tons, factory and office building, General Tire & Rubber Co., Akron, O.
- 400 tons, warehouse, Norfolk & Western railway, Sewalls Point, Va.; bids Nov 18.
- 350 tons, flood protection project, Massillon, O.
- 300 tons, housing project, Little Rock, Ark.
- 300 tons, Norton housing project, Barber-ton, O.; bids Dec. 11.
- 300 tons, including 73 tons shapes, Seattle naval reserve armory; bids at Olympia, Nov. 12 and 15.
- 250 tons, agronomy building, University of Minnesota, Minneapolis.
- 240 tons, Illinois highway department, route 8, Peoria, Ill.
- 217 tons, Harrison homes, Illinois project 3-2A, Peoria, Ill., bids Nov. 4.
- 200 tons, Gully brook conduit, section 1, Hartford, Conn.; W. W. Wyman Inc., contractor.
- 177 tons, engineering building, Marquette university, Milwaukee.
- 160 tons, state highway, No. 813, Athens county, Ohio; bids Nov. 15.
- 150 tons, warehouse building 801, Sears, Roebuck & Co., St. Louis, Fruin-Colnon Contracting Co., St. Louis, contractor.
- 140 tons, bridges and highway work, Lake, Grant, Josephine, Lincoln and Multnomah counties, Oreg., for state; bids opened.
- 130 tons, research laboratory, Rochester, Minn.
- 100 tons, warehouse, Central Steel & Wire Co., Chicago.
- 100 tons, flood wall, United States engineers, Muncie, Ind.

Pig Iron

Pig Iron Prices, Page 106

Pittsburgh — Production continues heavy, with Carnegie-Illinois Steel Corp. announcing an additional stack in blast at Edgar Thomson works this week. However, to offset this action the two stacks at Pittsburgh Crucible Steel Co.'s plant at Midland, Pa., have been on bank due to a strike. This affects the iron supply of other companies in the district since one stack has been supplying basic pig iron. New coke prices for the first quarter have not yet been settled, although they are expected within the next week or two. In all probability, supply contracts will be between \$5.00 and \$5.25, with spot prices at the higher level.

Cleveland — Inquiry is light but shipments are slightly ahead of the large tonnages of October. Consumers are well covered for the rest of the year. One large producer has kept salesmen at home for three weeks because of reluctance to sell. First quarter prices are expected by Dec. 1. Producers comment on the reasonableness of prices, \$23 today comparing with

STEEL

\$33 as the ceiling during the World war. Some idle and some semi-obsolete furnaces still exist which would operate again if prices were higher, thus making larger production possible. Soon producers will have decided whether they will allow December contracts to be extended into 1941.

Chicago—Gray iron and malleable foundries are increasing melt as demand for casting grows. Sellers are flooded with orders and are shipping on a full capacity schedule. Merchant blast furnaces are operating to their limit and shipping some of the current tonnage from stocks.

Boston — Shipments of pig iron against fourth quarter contracts are brisk, although buying is limited by ability of producers to take on additional tonnage beyond regular customer estimated requirements. Foundry melt tends upward. Producers of castings for machine tool trade continue most active.

New York—Pig iron specifications this month have been especially heavy, due not only to increasing requirements, but to a desire by a number of consumers to get material in yards before winter. Orders have been relatively small, as most consumers are covered for the remainder of the year and, in a number of important cases, beyond.

Philadelphia—Consumers are more anxious to take in iron against contracts in view of rising consumption and talk of tight supplies in coming months. Foundry operations are expanding, the district averaging 85 to 90 per cent. Orders for early shipment are limited to fill-in lots, but large tonnages on sellers' books will not be delivered until next quarter. Inquiry for them is moderate with prices still unnamed. Foundry coke movement is off from October, when consumers anticipated recent price advance.

Cincinnati—Demand for pig iron is at the highest level of the year with no letdown in sight. The iron is going for current needs. Spot buying in small lots is accelerated, but furnaces are not entering commitments for first quarter until opening of books Dec. 1. Armco has delayed lighting of a furnace, to be put on merchant iron, until Nov. 20. By-product coke is available for current needs but the situation is perplexing oven interests.

St. Louis—With melters generally covered for this year, purchasing of pig iron has dropped to small proportions. Shipments, however, continue high, reflecting partly the steadily broadening melt. Representatives of southern blast furnaces report that all orders are subject to confirmation.

Toronto, Ont. — Merchant pig iron sales are increasing. Some interests believe that heavier requirements for pig iron for steelmaking

and increase in merchant requirements this year, may soon result in shortage. Scarcity of some lines of scrap also is a factor that may have a bearing on pig iron markets soon.

Scrap

Scrap Prices, Page 108

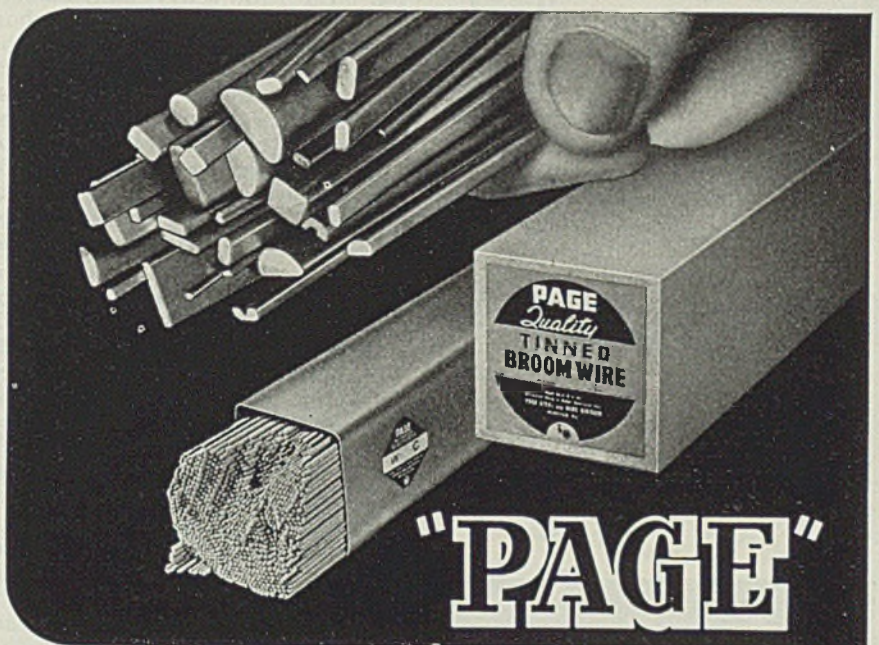
Pittsburgh—Prices on current railroad lists are at about the same level as last month. Demand for open-hearth material is not active at the moment, although buying is expected. Scrap now moving is at quoted levels. Blast furnace material is probably the most active, fair quantities of various cast grades being sold at current figures.

Cleveland—Only routine scrap business is being done but quotations are firm as holders are slow

to part with supplies. Cast scrap is strong and prices depend on urgency of need.

Chicago — Somewhat heavier trading in scrap the last few days has lifted prices 25 to 50 cents a ton on most important grades. Within the past week, No. 1 heavy melting steel has taken two 25-cent advances and is now selling within the range of \$20 to \$20.50, the latter figure established by a sale to a small mill. With dealers still holding back supplies, brokers are paying \$20.25 and \$20.50 for tonnage to meet current contracts. Despite the strong tone and ingot-making operations at 99 per cent, mills are not seeking scrap tonnages. Chief shortage of material is in electric furnace grades and railroad malleable.

Boston — Iron and steel scrap prices are somewhat mixed, but tend higher, notably cast grades for do-



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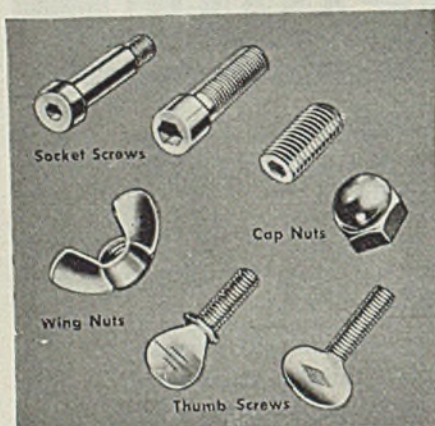


I USE 300 A DAY

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BECAUSE Parker-Kalon Cold-forged Socket Screws, Wing Nuts, Cap Nuts and Thumb Screws are made to such exacting standards, both small users and large enjoy the benefits that come with accuracy, strength, good design and fine finish. No wonder, then, that so many thousands have standardized on Parker-Kalon. Samples and prices are yours for the asking. Write.

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mestic shipment. In addition, blast furnace material for eastern Pennsylvania and district delivery has a slightly stronger tone. The first export cargo to England in several weeks, 4500 tons, cleared from Boston last week.

New York — Transfer of steel scrap accumulated on barges to cars for shipment to eastern Pennsylvania is practically complete. Substantial domestic shipments are maintained and accompanied by some further buying at \$16.50, f.o.b. cars, for No. 1 heavy melting steel. An eastern mill is reported to have bought close to 20,000 tons at about this price. Foundries are also taking in supplies and prices on all grades are firm and generally unchanged. Export business lags for lack of boats.

Philadelphia—Prices show greatest strength in cast grades, several of which have advanced further. Heavy melting steel is unchanged but firm with heavy mill demand met without difficulty. Low phosphorus scrap is active for electric furnace plants and better foundry operations are strengthening cast grades. One boat is being loaded for export but relatively light foreign movement is in prospect for the near future. A threatened strike of local scrap yard workers is expected to come to a head this week.

Buffalo—Steelmaking grades were boosted 50 cents a ton on a sale of approximately 5000 tons to a mill consumer. On the basis of the sale No. 1 heavy melting was quoted at \$21 to \$21.50 a ton while the differential on No. 1 busheling and compressed sheets was cut from \$2 to \$1.50 a ton. Specialties also jumped 50 cents a ton on sales at \$25.50 to \$26 a ton.

Detroit — Not in several years has there been as heavy movement of scrap in this territory as in the past two months. Result is that the leading consumer is well supplied and hard pressed to accommodate more. Busheling, heavy melting steel, plate scrap, compressed bundles and loose clippings are all quoted 25 cents a ton below previous prices. With prices easier and supplies ample, buyers for small outstate steel mills who normally never enter the Michigan market are seeking tonnage.

Cincinnati—Prices on several of the lighter grades of iron and steel scrap were advanced 25 to 50 cents. Efforts at stabilization are evident but dealers contend material is not being attracted in quantities to support the high melting rate. Some dealers are slow to release tonnage while replacement stocks are so scarce. Bidding on current railroad lists is active.

St. Louis—Mills and foundries are still out of the scrap market, except for small tonnages of special

material, and buying activity is confined largely to covering contracts by dealers and brokers. Prices in the main are steady. Certain steel specialties, including car axles, springs, knuckles and couplers and guard rails, are higher. Cast and malleable grades, which are scarce, are slightly higher.

San Francisco—While prices in the San Francisco metropolitan district continue firm those in the Los Angeles area are off 25 cents a net ton, as there are more open-hearth producers in the northern area than in the southern part of the state. Los Angeles district prices are now \$12.50 to \$13 a net ton for No. 1 and \$11.50 to \$12 a net ton for No. 2 heavy melting steel.

Seattle—Export outlets closed, the market is admittedly weaker. However, rolling mills are not pressing their advantage. Whereas a recent top price of \$16 per gross ton was paid by local interests, mills have established a level of \$15. Some material that failed to get aboard ship before the embargo deadline is being offered to domestic users. Tidewater stocks are ample for pending needs and receipts are fair.

Warehouse

Warehouse Prices, Page 107

Cleveland—Jobbers are selling as much as carlots at a time and often doing what is a normal mill business. Jobbers find it increasingly difficult to build up depleted stocks. They note that mills frequently prefer to sell direct to customers with identified projects in mind than to warehouses who are stocking for less definite uses.

Chicago — Indications are that November warehouse sales will surpass those of the two preceding months. Inquiries are particularly heavy. Demand is well diversified both as to product and consuming industry, with a large but indefinite aggregate springing from national defense. Mill deliveries are slowing with some products becoming exceedingly tight, notably plates and bars.

Philadelphia—Sales are fully maintaining the October pace and are generally satisfactory regarding diversification and price steadiness. Some distributors make further additions to stocks to obviate delayed mill deliveries.

Buffalo — Warehouse business holds around the peak of the current movement. With replenishing supplies from the mills delayed stocks of many items are low. Prices are strong.

Cincinnati — Jobbers are being pressed to maintain stocks on building items in view of demand for

STEEL

plant additions. These sales aid in sending volume to a new high for the year, other needs showing no sign of tapering.

St. Louis—Warehouse interests report sales this month in such volume that total will be the peak for the year to date. The general manufacturing trade is offering principal support to general business at the moment.

Seattle—Plates, shapes and sheets are in best demand and are moving in increasing tonnages. Shipbuilding requirements call for prompt delivery and are reducing local stocks. The price situation is unchanged, firm at present levels.

Nonferrous Metals

New York — Nonferrous metal prices held firm and generally unchanged last week despite a further tightening in the supply situation. Demand continued excellent with sales equal to or in excess of production. Sellers look to foreign sources for additional supplies.

Copper — While mine producers continued to quote electrolytic at 12.00c, Connecticut, on allocated business, custom smelters and brokers offered metal at $\frac{3}{4}$ to $\frac{1}{2}$ -cent a pound premium. Producers are sold solidly well into February. Domestic refined stocks dropped 20,695 tons last month to only 164,618 tons, equal to about six weeks' requirements, as shipments rose to 103,771 tons, a new all-time high. An estimated shortage of 80,000 tons next year may be covered by importation of South American copper. Shipments of copper from Chile to Japan may be canceled if the metal is needed for national defense in this hemisphere.

Lead — Consumers are buying around 20,000 tons of lead per week while producers are shipping about 15,000 tons and producing about 12,500 tons. A substantial portion of recent sales have involved lead of foreign origin. Although producers are sold out for the balance of this year, they held prices unchanged at 5.65c, East St. Louis.

Zinc—Common grade sales are averaging two to three times current output as consumers cover their far forward requirements. Stocks are now equivalent to less than one week's shipments, restricting new business to about 6000 tons, the present output rate.

Tin—Principal markets remained unusually calm following the loss of 1500 tons of Australian pig lead in the South Seas on the first American boat sunk in the war. Straits spot held steady at 50.50c to 50.75c, reflecting this country's one year supply, the large amount afloat, and the slack 45 per cent tin plate operating rate.

Nonferrous Metal Prices

| Nov. | Copper | | | Straits Tin, New York | | Lead N. Y. | Lead East St. L. | Zinc St. L. | Aluminum 99% | Antimony Amer. Spot, N. Y. | Nickel Cathodes |
|------|---------------------|--------------------|-------------------|-----------------------|---------|------------|------------------|-------------|--------------|----------------------------|-----------------|
| | Electro, del. Conn. | Lake, del. Midwest | Casting, refinery | Spot | Futures | | | | | | |
| 9 | 12.00 | 12.00 | 12.12 1/4 | 51.00 | 50.25 | 5.80 | 5.65 | 7.25 | 18.00 | 14.00 | 35.00 |
| 11 | Holiday | | | | | | | | | | |
| 12 | 12.00 | 12.00 | 12.12 1/2 | 50.75 | 50.25 | 5.80 | 5.65 | 7.25 | 18.00 | 14.00 | 35.00 |
| 13 | 12.00 | 12.00 | 12.12 1/2 | 50.75 | 50.25 | 5.80 | 5.65 | 7.25 | 18.00 | 14.00 | 35.00 |
| 14 | 12.00 | 12.00 | 12.12 1/2 | 50.75 | 50.25 | 5.80 | 5.65 | 7.25 | 18.00 | 14.00 | 35.00 |
| 15 | 12.00 | 12.00 | 12.12 1/4 | 50.50 | 50.15 | 5.80 | 5.65 | 7.25 | 18.00 | 14.00 | 35.00 |

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

| Sheets | |
|----------------------|-------|
| Yellow brass (high) | 19.23 |
| Copper, hot rolled | 20.62 |
| Lead, cut to jobbers | 9.05 |
| Zinc, 100 lb. base | 12.50 |

| Tubes | |
|-------------------|-------|
| High yellow brass | 21.98 |
| Seamless copper | 21.12 |

| Rods | |
|--------------------|-------|
| High yellow brass | 14.76 |
| Copper, hot rolled | 17.12 |

| Anodes | |
|-------------------|-------|
| Copper, untrimmed | 17.87 |

| Wire | |
|---------------------|-------|
| Yellow brass (high) | 19.48 |

OLD METALS

| Nom. Dealers' Buying Prices | |
|-----------------------------|---------------------|
| No. 1 Composition Red Brass | |
| New York | 8.00-8.25 |
| Cleveland | 8.62 1/2 - 9.12 1/2 |
| Chicago | 8.25-8.50 |
| St. Louis | 8.37 1/2 |

| Heavy Copper and Wire | |
|-----------------------|---------------------|
| New York, No. 1 | 9.62 1/2 - 9.87 1/2 |
| Cleveland, No. 1 | 9.37 1/2 - 9.87 1/2 |
| Chicago, No. 1 | 9.75-10.00 |
| St. Louis | 9.37 1/2 |

| Composition Brass Turnings | |
|----------------------------|---------------------|
| New York | 7.62 1/2 - 7.87 1/2 |

| Light Copper | |
|--------------|---------------------|
| New York | 7.62 1/2 - 7.87 1/2 |
| Cleveland | 7.37 1/2 - 7.87 1/2 |
| Chicago | 7.75-8.00 |
| St. Louis | 7.37 1/2 |

| Light Brass | |
|-------------|---------------------|
| Cleveland | 4.12 1/2 - 4.37 1/2 |
| Chicago | 5.62 1/2 - 5.87 1/2 |
| St. Louis | 4.87 1/2 |

| Lead | |
|-----------|---------------------|
| New York | 4.90-5.00 |
| Cleveland | 4.00-4.25 |
| Chicago | 4.50-4.75 |
| St. Louis | 3.62 1/2 - 3.87 1/2 |

| Zinc | |
|-----------|---------------------|
| New York | 3.87 1/2 - 4.12 1/2 |
| Cleveland | 3.25-3.50 |
| St. Louis | 3.50-3.75 |

| Aluminum | |
|------------------------|-----------|
| Mis., cast, Cleveland | 9.25-9.50 |
| Borings, Cleveland | 6.50 |
| Clips, soft, Cleveland | 14.25 |
| Misc. cast, St. Louis | 7.75-8.00 |

SECONDARY METALS

| | |
|--------------------------------------|-------------|
| Brass ingot, 85-5-5-5, less carloads | 13.25 |
| Standard No. 12 aluminum | 15.00-15.50 |

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THE BEST STEEL-CUTTING CARBIDE

"Its Greater Strength Guarantees Dependable Performance" . . .

KENNAMETAL is considerably stronger than any other carbide tool material . . . consequently can take deep, heavy cuts (see illustration), plunge cuts, or intermittent cuts, without breakage . . . and performs reliably over a long period of tool life.

Prices of Standard KENNAMETAL tools and blanks have been drastically reduced . . . so that KENNAMETAL production economies are now available to all machine shops, large or small. Write today for a copy of the new Price List No. 5.



Turning a 10-inch diameter chrome-nickel-molybdenum forging, 46 Scleroscope hard, at 150 ft. per minute. Feed, 1/32"; depth of cut, 3/8" to 7/16".



Style No. 11 Tool with Chip Breaker

MCKENNA METALS Co.

200 LLOYD AVENUE

LATROBE, PENNSYLVANIA, U.S.A.

Steel in Europe

Foreign Steel Prices, Page 107

London—(By Cable)—Steel and iron demand continues unabated in Great Britain with producers working at capacity. The recent increase in prices has had no effect on demand. The situation in hematite pig iron is easier as domestic output is increasing. Ore imports are slightly irregular but domestic delivery is heavier. Tin plate exports continue quiet. Output of sheets and galvanized sheets is

mainly absorbed by domestic requirements.

Ferroalloys

Ferroalloy Prices, Page 106

New York—A leading seller has reaffirmed contract prices for first quarter on ferrovanadium, ferrotitanium, alsi-fer and its complete line of foundry alloys, as well as following action of other sellers in reaffirmation of ferrosilicon and ferrochrome contract prices.

Virtually all ferroalloy sellers

now have extended prices for next quarter. Action in the opening of books for the new quarter is much earlier than usual, due primarily to desire of sellers to eliminate all speculative buying that might arise as a result of possible uncertainty with respect to future contract prices.

Movement of ferromanganese, which was among other important ferroalloys to be reaffirmed recently, has been particularly heavy this month, with all indications pointing to the likelihood that November will mark the fourth monthly increase. Some leading trade interests believe that shipments this month, barring those which have been stimulated on other occasions by prospective price increases, will be the heaviest on record.

Equipment

Seattle — Sustained volume of business is reported by dealers, automotive, electrical items and heavy construction equipment being in strong demand. Bonneville project, Portland, will open bids Nov. 22 for four 25,000-kva transformers, Spec. 1519, also for disconnecting switches, Spec. 1523, and Nov. 29 for three 230 kva circuit breakers, Spec. 1529. Denver will receive tenders Dec. 2 for six 230 kva disconnecting switches, for the Coulee power plant, Spec. 939. Home Electric Co. is low to Tacoma for furnishing 32½ tons copper wire.

100 Manufacturers in Purchasers' Exhibit

"What Is New in Industry" was the slogan-appeal which attracted good attendance at the twelfth annual products exposition sponsored by the Purchasing Agents Association of Chicago, Nov. 13-14.

One hundred manufacturers, many in the iron, steel and metals field, were represented with exhibits of their products. M. J. Hartigan, Joseph T. Ryerson & Son Inc., was chairman of the exposition committee. Walter Bautz, Chicago Rivet & Machine Co., was one of two vice chairmen.

Celebrates Anniversary

■ Hamilton Steel Co., Cleveland, steel distributor, last week celebrated its tenth anniversary by entertaining 650 representatives of steel mills and customers at dinner in the company's warehouse.

George Hackett, development engineer of Accles & Pollock Ltd., Birmingham, England, was one of the guests. Mr. Hackett recently

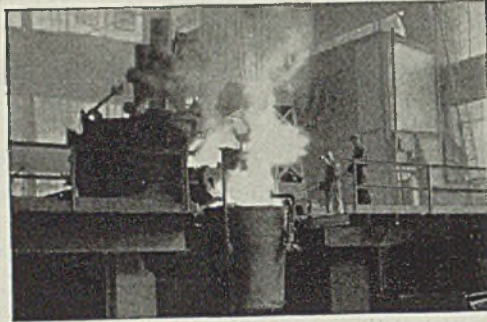
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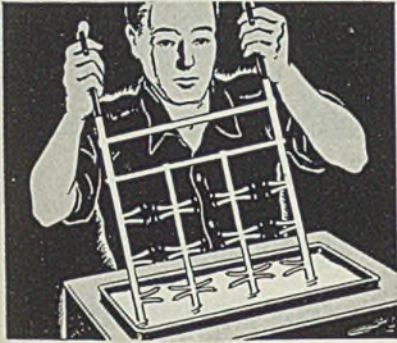
All dressed up for the Winter. A streamlined lobby—a smartly refurbished Cocktail Lounge offering a delightful interlude on the way to the beautiful Burgundy Room, the Hunt Room, famous Bar Cafe in the club manner—await you. Reasonable rates.

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RACK COATING W*
"FOUR TO ONE
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THIS statement made by a recent "Unichrome"* Rack Coating-W user is typical of the enthusiastic praise earned by "Unichrome"* Rack Coating-W wherever used.

We are sure you will agree that this new rack-coating material is indeed remarkable when you consider its unequalled combination of advantages:

1. Withstands boiling cleaners and all plating solutions
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3. Contains no ingredients harmful to plating solutions
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5. Easy to apply—"dip and force dry" method
6. Light in color—easy to see how well the rack is covered
7. Any part of rack can be recoated without recoating entire rack.

Write for Bulletin No. 20
 Containing Complete Information—

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*Trade Mark
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supervised construction and initial operation of a steel mill in Australia.

H. K. Hamilton is president of Hamilton Steel Co., which recently installed a stock of aircraft steels. W. C. Thompson is secretary-treasurer.

CONSTRUCTION
and ENTERPRISE

Ohio

BARBERTON, O.—Columbia Chemical Division of Pittsburgh Plate Glass Co., E. T. Asplundh, vice president, will start development of limestone quarry near here, including conveyor systems to move material. Cost is estimated at \$2,000,000.

CANTON, O.—Diebold Safe & Lock Co., 2647 Navarre road, is building \$15,000 storage building. Melbourne Bros., 2101 Woodland avenue N.W., are contractors.

CLEVELAND—City council has authorized the federal government to take up to 200 acres at municipal airport for site of \$8,500,000 aviation laboratory, tentatively decided on for that location. John F. Victory is secretary of national advisory committee for aeronautics of the war department, charged with final decision on location.

CLEVELAND — Aluminum Co. of America, 2210 Harvard avenue, has bought 20 acres near its plant and will build two buildings for foundry purposes, 120 x 360 feet and 200 x 440 feet. F. A. Billhardt, company engineer, Pittsburgh, is in charge.

CLEVELAND—Hertner Electric Co., 12690 Elmwood avenue, will take bids

■ Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 116 and Reinforcing Bars Pending on page 117 of this issue.

soon through Walter Caldwell, architect, 838 Engineers' building, for two-story office building, 40 x 100 feet.

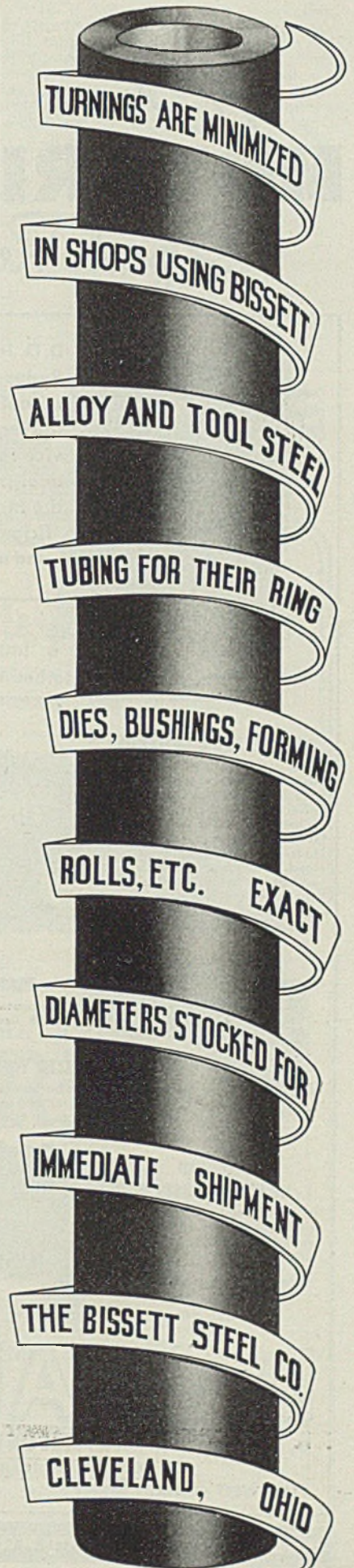
CLEVELAND — Schirmer Dornbier Pump Co., 1719 East Thirty-ninth street, Waldo P. Schirmer, president, will build addition with 2100 square feet for manufacturing and assembly.

CLEVELAND — Thompson Products Inc., 2196 Clarkwood road, W. H. West, assistant factory manager, has plans, contingent on large government contract for valves and fuel pumps, for increasing facilities three to four times.

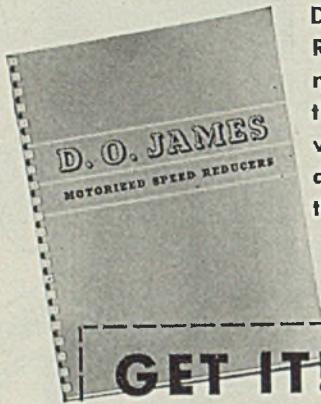
CLEVELAND—Bennett Products Inc., C. R. Bennett, 14416 Potomac avenue, plans to start production of small automatic machines early in 1941 and is now seeking small plant.

CLEVELAND—Cleveland Diesel Engine division of General Motors Corp., 2160 West 106th street, announces a factory addition of 12,000 square feet and boiler room extension in addition to previous expansion program. Cost is estimated at \$43,000. George W. Codrington is general manager.

CONNEAUT, O.—General Electric Co.



MOTORIZED Speed Reducers

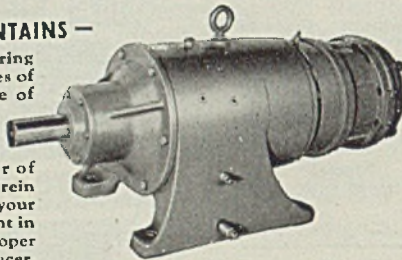


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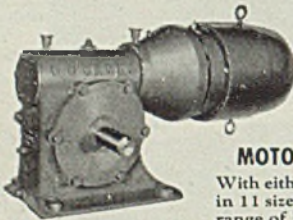
THIS CATALOG CONTAINS —

112 pages of engineering data, weights and prices of the D. O. James line of Motorized Reducers. It lists completely selection tables, service factors and character of load. Information therein will prove helpful to your engineering department in the selection of the proper type of Motorized Reducer.



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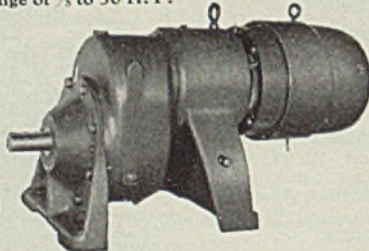
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PANGBORN CORPORATION • HAGERSTOWN, MD.

will build one-story factory 100 x 500 feet for manufacture of lamp bases, to cost about \$250,000. Plans to be drawn by E. J. Edwards, company engineer, Nela Park, Cleveland. Ten acres near Nickel Plate tracks at western edge of city have been bought as site.

DAYTON, O.—Durliron Co., 450 North Findley street, will let contract soon for a 100 x 180-foot foundry and 25 x 170-foot warehouse, to cost over \$40,000. Geyer & Neuffer, Arcade building, are architects.

ELYRIA, O.—Harshaw Chemical Co., 1945 East Ninety-seventh street, will enlarge Elyria plant on John street by addition of 7500 square feet to processing plant. H. E. Cowser is company engineer and is receiving bids.

LORAIN, O.—American Stove Co., Long avenue and Thirteenth street, is enlarging plant by addition of 30 x 121-foot structure.

MEDINA, O.—Permold Co., East Cleveland, O., will build a two-story 80 x 350-foot plant here for manufacture of aluminum products, at cost of about \$125,000.

SANDUSKY, O.—Brown Industries Inc., Oliver Rinderle, president, is adding 6000 square feet of factory space for production of castings for machine tool and automotive industries.

Connecticut

BRIDGEPORT, CONN.—Peerless Aluminum Castings Co., care P. Petropky, architect, 952 Main street, has let general contract to A. Christianson, 85 Dogwood lane, Fairfield, Conn., for a one-story 50 x 152-foot plant.

DEVON, CONN.—Connecticut Light & Power Co., Waterbury, Conn., plans expansion of plant at Devon, including 43,000-kw turbine generator and auxiliaries, to cost over \$3,500,000.

STRATFORD, CONN.—Vought-Sikorsky division, United Aircraft Corp., Main street, has plans by C. W. Walker, 915 Main street, Bridgeport, Conn., for a one-story 60 x 80-foot manufacturing building and 40 x 60-foot administration building. (Noted Oct. 28.)

Massachusetts

NEW BEDFORD, MASS.—City clerk, city hall, has plans for municipal airport, including runways, hangars and shops, at Shawmut avenue and Plainfield road, to cost about \$569,000.

Vermont

SPRINGFIELD, VT.—Fellows Gear Shaper Co., River street, will build a one-story 60 x 60-foot castings storage unit. General contract to Harty, Blaney Construction Co., 25 Hamilton avenue, Boston.

New York

BETHPAGE, N. Y.—Grumman Aircraft Corp., manufacturer of aircraft, will build an addition covering about 500,000 square feet, costing \$2,000,000. Austin Co., Cleveland, has contract for design and construction.

BUFFALO—Buffalo Niagara Electric Corp., Colonel W. Kelley, vice president, 600 Electric building, has let general contract to General Electric Co., Schenectady, N. Y., for a generator plant addition at the Charles R. Huntley steam plant, at cost of about \$6,000,000.

COLLEGE POINT, N. Y.—Edo Aircraft Corp. will build a two-story addition containing 50,000 square feet, costing over \$150,000. Brown & Mathews

Inc., 122 East Forty-second street, New York, is engineer.

DANSVILLE, N. Y.—Foster Wheeler Co., manufacturer of oil refining and power plant equipment, will take bids soon for a 100 x 120-foot plant addition costing over \$40,000, with equipment. T. R. Hugo, care owner, is engineer. (Noted Oct. 28.)

HUDSON, N. Y.—Universal Atlas Cement Co., 135 East Forty-second street, New York, will build a two-story 43 x 72-foot laboratory and two-story 60 x 260-foot shop building. (Noted Sept. 30.)

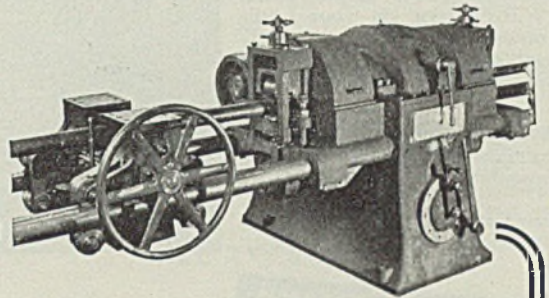
NORTH TONAWANDA, N. Y.—National Grinding Wheel Co. Inc., Walek road, will build a two-story 85 x 130-foot plant, estimated to cost \$75,000. General contract to Laur & Mack Contracting Co. Inc., 1400 College avenue, Niagara Falls, N. Y. J. Russ, care owner, is engineer.

OLEAN, N. Y.—City will build municipal airport east of city, to cost about \$100,000. C. H. Weatherall is city engineer.

New Jersey

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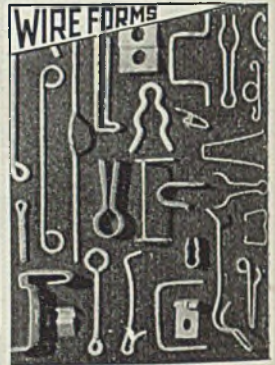
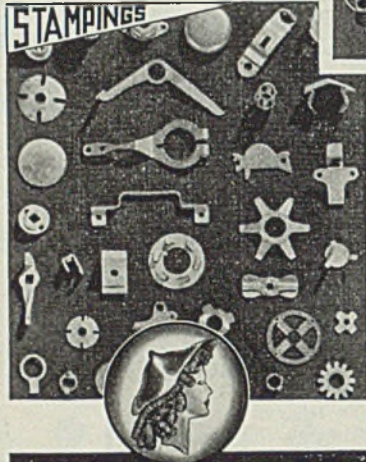
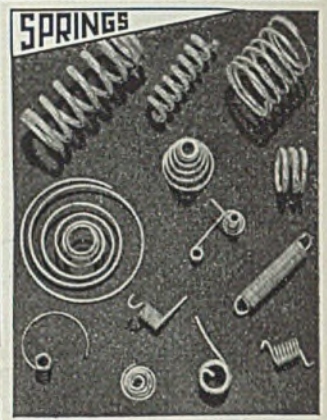
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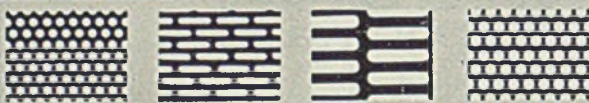
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GEORGE KOCH SONS - EVANSVILLE, IND.

Mfg. Co., 237 Laural avenue, is asking bids on a two-story 100 x 160-foot plant addition. J. T. Simpson, 6 Atlantic street, Newark, N. J., is architect.

LONG BRANCH, N. J.—City plans construction of sewage disposal plant as WPA project, at cost of \$207,984. W. D. Cogle, 1105 South Broad street, Trenton, N. J., is engineer.

Pennsylvania

PITTSBURGH—Peoples Natural Gas Co., 545 William Penn way, will build 90 miles of gas pipe line from Limestone township, Clarion county, to Hebron township, Potter county, Pennsylvania, at cost of more than \$100,000.

READING, PA.—Reading Sheet Metal Products Co. Inc., Canal and Chestnut streets, has plans by Muhlenberg, Yerkes & Muhlenberg, Ganster building, for a manufacturing plant on Third street, to cost about \$40,000. (Noted Nov. 4.)

READING, PA.—Reading Steel Casting Co., Tulpehocken street, will build a machine shop costing about \$75,000.

YORK, PA.—York Safe & Lock Co. has let general contract for two plant units on a 197-acre site to Cummins Construction Co., 803 Cathedral street, Baltimore. Estimated cost \$1,700,000, with equipment.

Michigan

ANN ARBOR, MICH.—Buhr Machine Tool Co. will build a plant addition on plans by Fry & Kasurin, architects, Ann Arbor, Mich.

AUBURN HEIGHTS, MICH.—Superior Metal Products Co. has plans by W. D. Knox, Pontiac, Mich., for a factory and office addition.

BATTLE CREEK, MICH.—American Stamping Co. is building a two-story plant addition. Edward Tuttle, Battle Creek, is architect.

DETROIT—Snyder Tool & Engineering Co. has let general contract to Darin & Armstrong Inc., Detroit, for an office and crane runway addition to its plant.

DETROIT—Commercial Steel Treating Corp. has given contract to H. C. Wright, Detroit, for a \$30,000 plant addition.

DETROIT—A A A Springs Inc. has been incorporated to manufacture springs, with \$3000 capital, by Ritchie S. Barrie, 17728 John R. street, Detroit.

FERNDALE, MICH.—Triangle Engineering Co. has been incorporated with \$25,000 capital to manufacture jigs, tools and machines, by Charles M. Smillie Jr., 22747 Woodward avenue, Detroit.

PLYMOUTH, MICH.—Kelsey-Hayes Wheel Co., Detroit, will build a plant and boilerhouse in Plymouth, 280 x 840 feet. Glufels & Vallet Inc., is architect.

SAGINAW, MICH.—Wilcox-Rich division Eaton Mfg. Co., Herbert P. Russell, plant manager, will build 120 x 186-foot addition to house aircraft engine parts manufacture.

Illinois

CHICAGO—Handy Button Machine Co., 540 North Western avenue, has plans by A. Epstein, 2001 West Pershing road, for a one-story plant at Twenty-third and Rockwell streets, costing about \$125,000.

CHICAGO—City asking bids on 29 escalators for State and Dearborn streets subways, to close Dec. 5.

Indiana

ANDERSON, IND.—Delco-Remy divi-

sion, General Motors Corp., O. V. Badely, general manager, 2401 Columbus avenue, will build a power plant, including boilers, on East Twenty-seventh street, to supply steam and power to plants 3 and 7, at cost of \$75,000; preliminary survey under way for 450 x 600-foot plant at East Twenty-ninth and Monroe streets, estimated cost \$350,000, with equipment.

ANDERSON, IND.—Board of public works plans to expand municipal power plant, including 1200-horsepower boiler, superheater, economizer and auxiliaries, at cost of about \$300,000. Russell B. Moore & Co., Indiana Pythian building, Indianapolis, are consulting engineers.

SOUTH BEND, IND.—Bendix Aviation Corp. will add 150,000 square feet to manufacturing space for national de-

vised production of aircraft carburetors, landing gears, aircraft hydraulic apparatus and similar products. Austin Co., Cleveland, has contract. (Noted Oct. 14.)

Virginia

NORFOLK, VA.—Virginia Smelting Co., West Norfolk, will build a four-story plant addition. General contract to J. P. Peddyjohn, Lynchburg, Va. Cost estimated over \$40,000. Ballinger Co., 105 South Twelfth street, Philadelphia, engineer.

Missouri

ST. LOUIS—Sterling Aluminum Products Inc., 2925 North Market street, will build a factory at North Market and Glasgow streets, 81 x 112 feet. Edward

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of

ALL TYPES AND SIZES

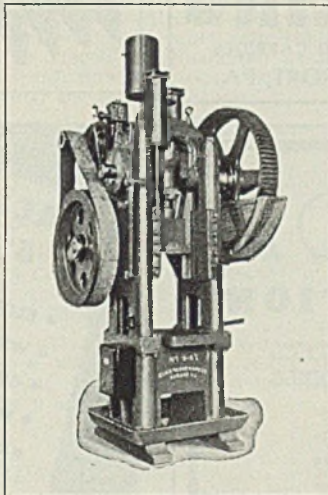
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HAMILTON, ONTARIO

BELMONT IRON WORKS

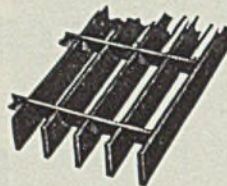
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J. Lawler, 3736 West Pine boulevard, is architect.

Wisconsin

LACROSSE, WIS.—REA has allocated \$1,100,000 to Tri-State power co-operative, Lawrence Cole, co-ordinator, for two additional 4000-kw turbo-alternating units, construction of tie-line between Genoa plant and Trempealeau substation of Wisconsin power co-operative and auxiliary equipment.

MANITOWOC, WIS.—Manitowoc Shipbuilding Co. will erect a welding shop costing \$87,000 and make additions to machine shop and office, to give facilities for construction of ten submarines.

NORWALK, WIS.—Village, V. C. Wrick, clerk, is taking bids on materials for construction of sewage disposal plant to cost \$27,000. Frank J. Davy & Son, 502 Main street, LaCrosse, Wis., is consulting engineer.

PHILLIPS, WIS.—REA has allocated \$300,000 to Price electric co-operative, Arthur G. Johnson, president, for 360 miles rural transmission lines to serve 964 customers. Wisconsin development authority, 522 Tenney building, Madison, Wis., is consulting engineer.

READSTOWN, WIS.—Village, R. Sheffield, clerk, is taking bids on materials for sewage disposal plant and sewers to cost \$270,000, a WPA job. Frank J. Davy & Son, 502 Main street, LaCrosse, Wis., are consulting engineers.

Minnesota

BAUDETTE, MINN.—REA has allocated \$196,000 to North Star electric co-operative, Clarence Peterson, co-ordinator, for 227 miles rural transmission lines to serve 538 customers. General Engineering Co., 2944 Cedar avenue, Minneapolis, is consulting engineer.

BRECKENRIDGE, MINN.—City, Ruth Hamilton, clerk, holds special election Nov. 18 on \$75,000 in bonds to aid financing WPA sewage disposal plant.

MAHOMEN, MINN.—REA has allocated \$155,000 to Wildwood electric co-operative for 204 miles rural transmission lines to serve 424 customers.

MINNEAPOLIS — Pioneer Engine Works, L. W. York, president, 1515 Central avenue, has plans by A. B. Dunham, 315 Essex building, for a one-story factory addition costing over \$40,000 with equipment.

RUSH CITY, MINN.—Village, Harry L. Sherman, clerk, takes bids to Nov. 20 for power plant building, generating and auxiliary equipment and distribution system. Ralph D. Thomas & Associates, 1209 Second avenue South, Minneapolis, are consulting engineers.

WHEATON, MINN.—Village, M. J. Fridgen, clerk, is taking bids to Nov. 26 on construction of sewage disposal plant, with sewers and water mains. G. M. Orr & Co., 542 Baker Arcade building, Minneapolis, is consulting engineer.

Nebraska

KEARNEY, NEBR.—City, Mrs. Harriette J. Nelson, clerk, is making survey for sewage disposal plant to cost about \$220,000. Douglas McKnight, Lincoln, Nebr., is consulting engineer.

Iowa

CLINTON, IOWA—Interstate Power Co. will spend \$100,000 for improving its plant here, including additional boiler and ash and dust eliminators.

STANTON, IOWA—REA has allocated \$135,000 to Nyman electric co-operative, Oscar Wenstrand, president, for 149 miles

rural transmission lines to serve 379 customers.

California

LONG BEACH, CALIF.—Industrial Metals & Supply Co., 1631 West Anaheim street has been formed by L. A. Wells and Walter Schenk.

LOS ANGELES — Advance Aircraft Tool Co., 6767 Romaine street, has been formed by Samuel M. Tymann and Leo Schnigel.

LOS ANGELES—Hockaday-Newby Aircraft Inc. has been incorporated with 100 shares no par value, by Noel Hockaday, Burbank, Calif., H. L. Newby, South Pasadena, Calif., and associates. H. C. Brilliant, Chapman building, Los Angeles, is representative.

LOS ANGELES—Presteel Corp. has been incorporated with \$75,000 capital by Austin Sherman, Los Angeles, and associates.

LOS ANGELES—Columbia Stamping & Mfg. Corp. has been incorporated with \$50,000 capital by J. E. Franklin, Curt W. Bohman and Elsie Wyatt, Los Angeles. P. Harold Decker, Title Insurance building is representative.

LOS ANGELES—Aircraft Machinery Corp. has been incorporated with \$75,000 capital by Harold W. Nash and associates. Marcus, Rawbin & Nash, 608 South Hill street, are representatives.

SAN DIEGO, Calif.—Tenbar Machine Co. has been incorporated with \$25,000 capital by Harold A. Tenney, Dave Bell and L. G. Maple. Renwick Thompson, 504 First National Bank building, San Diego is representative.

VAN NUYS, CALIF.—Adel Precision Products Corp., 10737 Vanowen street, is building an addition 122 x 182 feet, costing about \$29,000.

WILMINGTON, CALIF.—Wilmington Welding & Boiler Works, 115 North Marine avenue, has been formed by Henry D. Wallace and associates.

Oregon

THE DALLES, OREG.—Wasco county electric co-operative is taking bids for 265-mile power line for which \$240,000 is available. P. L. Adkins, Wenatchee, Wash., is engineer.

Washington

DAVENPORT, WASH.—Lincoln county electric co-operative is taking bids for 435-mile power line. Plans are by Columbia Engineering Co., Wenatchee, Wash., and cost is estimated at \$400,000.

SEATTLE—Tennent Steel Casting Co. Inc., recently incorporated, has established plant at 3444 Thirteenth avenue S. W. for manufacture of carbon, alloy and special steel castings. (Noted Oct. 28.)

SEATTLE—J. A. McEachern Co. has general contract for a steel fabricating shop 275 x 298 feet, costing \$125,000, for the navy at plant of Seattle-Tacoma Shipbuilding Co., where 20 destroyers are to be built.

VANCOUVER, WASH.—Aluminum Co. of America has completed construction of second unit and has started work on three additional units. Fill is being made by dredging turning basin in Columbia river.

WASHOUGAL, WASH.—Northwestern Electric Co. will spend \$20,000 on improvements at local substation, adding 66,000-volt transformer, switching and other equipment.

Canada

ST. JAMES, MAN.—Department of munitions and supply, Ottawa, Ont., will call bids soon for one-story engine test-

ing shop 100 x 400 feet, costing \$100,000. G. K. Shells, Ottawa, is deputy minister. Northwood & Chivers, 406 Nanton building, Winnipeg, Man., architects.

NEW GLASGOW, N. S. — Steel Furnishing Co., Washington street, manufacturer of springs and metal products, has let general contract for plant addition to Fraser, Mason & Fraser, to cost about \$65,000. H. Scott Cameron, 239 Washington street, is manager.

TORONTO, ONT.—Viceroy Mfg. Co. Ltd., 345 Royce avenue, manufacturer of rubber goods, is building plant addition to cost \$150,000. Harold J. Smith, 62 Charles street, is architect.

WINDSOR, ONT.—Walker Metal Products Ltd., 1511 Kildare road, has given general contract to Hein Construction Co., 172 Aylmer avenue, for plant addition estimated to cost \$45,000, with equipment. H. M. Gregor is manager.



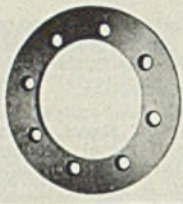
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WANTED—HIGH GRADE PLANT SUPERINTENDENT for modern structural steel shop in southern steel center. Must have had experience, be a good handler of men, must be able to plan work and get low costs. Floaters and those not qualified please do not reply. Address Box 361, STEEL, Penton Bldg., Cleveland.

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WANTED: STRUCTURAL STEEL DESIGNER. Must have ability design buildings, bridges and plate work. First-class references important. State salary expected in first letter. Address Box 347, STEEL, Penton Building, Cleveland.

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Federal Works Agency, Public Buildings Administration, Washington, D. C., Oct. 30, 1940.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Standard Time, Nov. 29, 1940, for construction of the U. S. P. O., Oak Park Station, Flint, Mich. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of \$10 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

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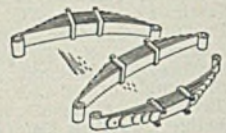
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