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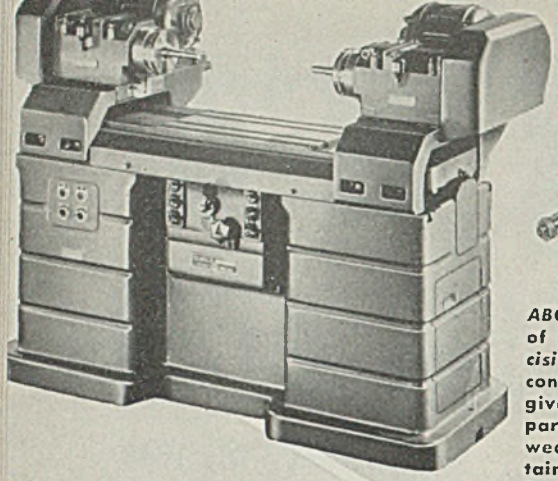
STEEL

ESTABLISHED 1882

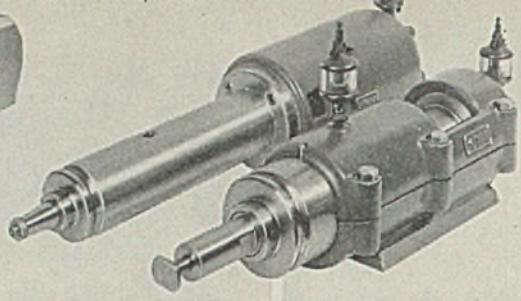
Contents

Volume 110—No. 4 January 26, 1942

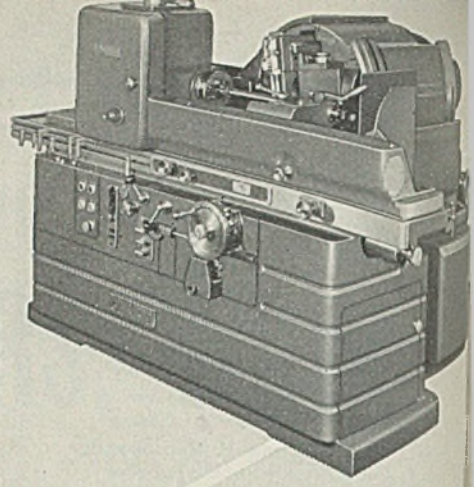
PRODUCTION • PROCESSING • DISTRIBUTION • USE



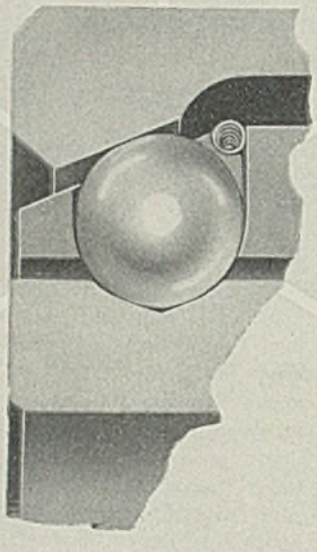
Precision Boring as universally used today was developed mainly through the availability of the Ex-Cell-O *Precision* spindle. Above is Style 1212-A, one of nine standard Ex-Cell-O Precision Boring Machines featuring the Ex-Cell-O *Precision* Spindle.



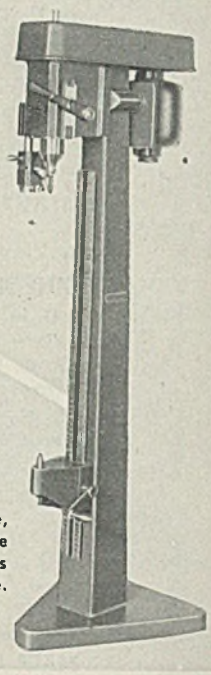
ABOVE: Ex-Cell-O motor-driven and belt-driven types of spindles. *BELOW:* Close-up view of Ex-Cell-O *Precision* Ball Bearing. Through the arrangement of point contact between the ball and the race, each ball is given a gentle spinning motion that results in every part of the surface of each ball being presented for wear. This minimizes bearing wear and aids in maintaining the spherical shape of each ball. Ex-Cell-O Precision Bearings on Ex-Cell-O Spindles are interchangeable as a unit.



Thread Grinding Machines, producing work to extremely close limits, must have *Precision* Spindles. Above is Style 35 Universal, one of eight styles of Precision Thread Grinders made by Ex-Cell-O, all equipped with Ex-Cell-O *Precision* Spindles.



TO LEFT: Ex-Cell-O Style 44 Carbide Tool Grinder, equipped with Ex-Cell-O inbuilt balanced motor spindle mounted in Ex-Cell-O *Precision* Ball Bearings.



TO RIGHT: Ex-Cell-O Center Lapping Machine, Style 74, for accurately conditioning female centers. This Ex-Cell-O machine also features the Ex-Cell-O *Precision* Ball Bearing Spindle.

PRECISION *begins with the* EX-CELL-O BEARING

The greater accuracy, increased production, and better finish that a large number of manufacturers are obtaining today on Ex-Cell-O machine tools equipped with the Ex-Cell-O Precision Spindle can, to a great extent, be attributed directly to the superior features of the Ex-Cell-O spindle ball bearing—a bearing specially designed by Ex-Cell-O and precision fitted by patented Ex-Cell-O methods. For instance, many thousands of Ex-Cell-O grinding spindles with these special bearings are in daily operation throughout American industry—satisfactorily meeting all the demands made upon them by today's strenuous production pace. This is why many manufacturers of grinders use the Ex-Cell-O Precision Spindle as part of their original equipment, and why numerous metal-working plants throughout the United States insist upon the Ex-Cell-O Precision Spindle whenever spindle replacements have to be made.

EX-CELL-O CORPORATION • DETROIT, MICH.

THREAD GRINDING, BORING AND LAPPING MACHINES • TOOL GRINDERS • HYDRAULIC POWER UNITS • GRINDING SPINDLES • BROACHES • CUTTING TOOLS • DRILL JIG BUSHINGS • DIESEL FUEL INJECTION EQUIPMENT • R. R. PINS AND BUSHINGS • PRECISION PARTS

XLO

★ EX-CELL-O means PRECISION

HIGHLIGHTING
THIS ISSUE OF
STEEL

■ ALREADY there is reason to feel reassurance that the appointment of Donald M. Nelson as director of the new War Production Board will almost at once bring a sharp acceleration in production for war. Last week **(p. 23)** he established the broad framework of an "interim" organization, delegating authority to qualified men to make decisions without consulting him; he will judge these men by the results that materialize. He is expected to bring about greater efficiency in procurement as well as production; for example, the bolt and screw industry is mystified **(p. 39)** over an enormous order for these products for use in repairing Army trucks; many of the sizes ordered are not used on such trucks.

• • •

Refuse To Strike

Sign of the times: Buick workers **(p. 26)** rejected a strike vote proposed by their leaders . . . . Standardization of cold-rolled steel sizes is under discussion **(p. 33)**; machine tool shipments have passed the billion-dollar level; asbestos from Africa is under priorities; machine tool prices have been frozen at the Oct. 1 level . . . . Use of nickel in many items is prohibited **(p. 36)**; cadmium is under full control; supplies for welding students are under priorities; copper products manufacturers are warned to file PD-189 . . . . Priorities have been applied to commercial airline travel **(p. 37)**; silver is available without charge for research work aimed at finding new uses.

• • •

Quotas for Repiacements

Quotas have been set for automobile replacement parts **(p. 42)**; a new service advises on availability of seamless steel tubing . . . . Oil and grease consumers are urged to return containers promptly **(p. 43)**; steel warehousemen complain of price ceiling injustices . . . . Lukens Steel Co. **(p. 44)** and Algoma Steel Corp. **(p. 46)** have new expansion programs . . . . The supply of industrial diamonds is under control **(p. 26)** . . . . Prices have been frozen on maintenance grades of dead-burned magnesite and similar action will be applied to other grades, also basic refractory brick **(p. 107)** . . . . Petroleum industry outside the country will have priority assistance **(p. 32)**; a survey is to be made of copper consuming plants; ceiling prices on lead products have been modified.

• • •

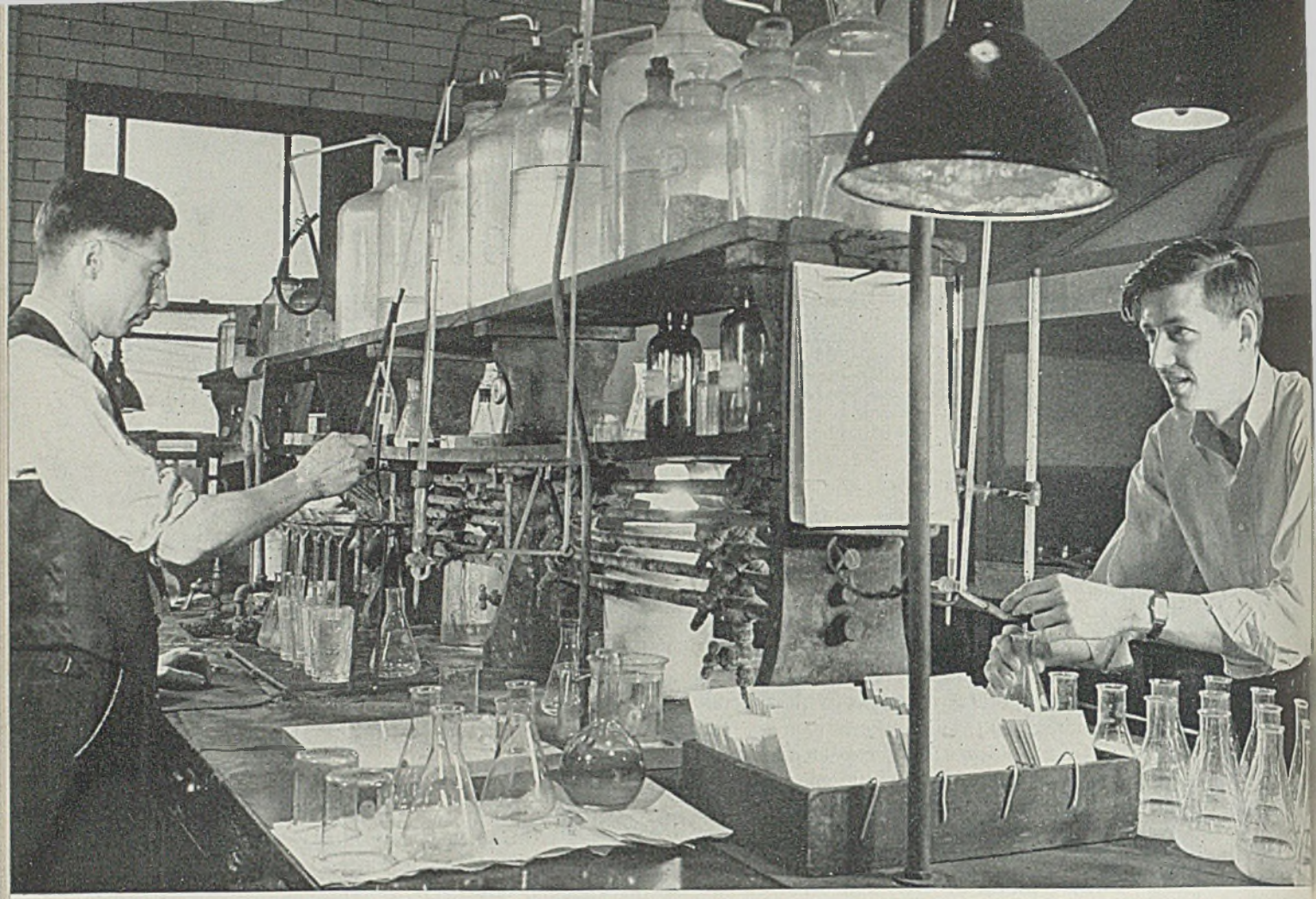
Flush Riveting

Flush riveting is one of many developments contributing to increased speed in today's fighting aircraft. Harry W. Ashburn relates **(p. 56)** the development and present practices employed in flush riveting the Bell Airacobra. . . . Conservation of tool steel by preventing tool damage is encouraged **(p. 60)** by a successful control plan. . . . A new assembly **(p. 64)** prevents running stoppers when pouring. . . . New plants speed construction of huge Flying Fortress bombers. Mechanical handling equipment **(p. 73)** is valuable production aid. . . . Serrated beams **(p. 88)** make better steel ships by saving steel, gaining strength.

• • •

Power Factor

One of the fastest and most economical ways to increase the capacity of your plant's electric power distribution system is to improve the system power factor, according to M. I. Alimansky and R. E. Insley **(p. 62)**. . . . W. A. Barrows describes **(p. 67)** how controlling the burning of porcelain enamel from the temperature of the ware instead of furnace temperature produces ware of better quality. . . . Harold Lawrence discusses **(p. 90)** the weldability of steels from the standpoint of cooling rates, a simplified approach to an intricate subject. . . . Modern lifting magnets handle many difficult jobs easily by following certain principles explained **(p. 82)** by Harry L. Wilcox.



More than 40 Years of Research —in Every Pound of Inland Steel

THE Inland Steel Company has always anticipated the exacting requirements of the metal working industry by producing finer, more uniform steel. For over 40 years, Inland research has been directed at this objective.

When Inland started its first mill, in 1893, every then known scientific method was applied to making its products. At first, research centered on making better harrow teeth, plow beams, merchant bars, etc. As the years have passed, Inland not only has added greatly to its physical plant, but also has greatly expanded research and metallurgical facilities.

Inland research has given industry such valuable steel mill products as: high-strength, low alloy Hi-Steel; lead-bearing, fast machining Ledloy; finer cold reduced tin plate; etc. Inland was among the first to offer the superior quality of sheets and strip made by continuous mills. Inland research has pioneered many steel processing methods and control devices by which steel of finer quality and greater uniformity are made.

Today, every pound of Inland Uniform Quality Steel has back of it over 40 years of intensive research.

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PILING · RAILS · TRACK ACCESSORIES · REINFORCING BARS

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38 S. Dearborn Street, Chicago • Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City, Cincinnati, New York

France Under the Iron Heel; Wounds "Mainly Economic"

Coal and oil lacking, factories find it difficult to operate . . . Steel output figures show effect of restrictions . . . Ten months to get small orders filled . . . Food inadequate

By STEEL'S FRENCH CORRESPONDENT

The accompanying article—written in France—was started on its way to STEEL late last year, and after devious routes and delays reached its destination last week. For manifest reasons the identity of the author cannot be revealed. France may be "out of the picture" temporarily—but what is happening inside of that country under the yoke of its conqueror still is of vital concern.—The Editors.

METALLURGICAL operations in France have been greatly hampered by the consequences of war in Europe. Destruction caused by the battles in France in 1940 was not very important, and at no time by itself did it prevent a revival of business. But major difficulties have been caused by the lack of railroad material and fuel, and the necessity of delivering products to Germany.

Before the war France was receiving coal from abroad; either from England, Holland, Belgium, Luxemburg or Germany, but now it has to depend on its own resources, and moreover is required to deliver coal to Italy.

The coal mines, and particularly those located in the Central and Southern districts of France, or unoccupied zone, have worked at full rate, but despite that lack of coal appears to be the great obstacle.

The quantities allowed for domestic uses are very small; central heating in most buildings is stopped. To save coal and lubricating oil traffic of all kinds has been greatly reduced. Consumption of electricity, part of which is produced by steam, has been restricted, and the same rules are applied to use of gas.

Industries which are the largest users of coal are suffering severely from the difficulty—and in some instances, the impossibility—of getting fuel. This refers particularly to iron and steel, production of which is at a low ebb.

The accompanying table compares the output in October, 1941—the latest period for which figures are obtainable—with the monthly average in 1938.

The disproportionate ratios for the various districts result from the fact that those plants nearest coal mines find it easier to obtain some supplies than do those situated at greater distances.

In the Nancy district, from which most of the output is delivered to Germany, production of course is more favored than that in the Longwy - Ardennes where many plants have not yet resumed.

The problem of distribution in all respects is serious. Due to reduced production of iron and steel, and crippled transportation facilities delays in deliveries have increased. A lapse of ten months between the placing of an order for a small amount of steel and the delivery is not unusual. The mills have cut their schedules and rollings to a very limited list.

In the occupied zone, when an order is received by a company agent, it is transmitted to the Comptoir des Produits Siderurgiques, which submits it to the German Control Organization, for agreement. Then it is returned to the Comptoir which passes it to the works. All this takes one month. The customer knows in advance that at least two months will be needed to fill the order.

Actually many orders for steel from the occupied zone are filled by German plants of the Stahlwerksverband. The tonnage thus delivered is approximately equal to the tonnage supplied by the French to the German army or to the plants that manufacture orders for the German industry.

The Northern district provides the occupied zone with only a small quantity of steel, because all its production is supposed to be reserved for the industries of this district, and the tonnage which can be delivered in the occupied zone is subject to a transport license which is given in the limits of the allotment allowed by German authorities.

Between October, 1940, and January, 1941, the needs of steel in the occupied and unoccupied zones was 230,000 tons per month, while their production was about 50,000 tons, augmented by 25,000 tons delivered by the Northern and Eastern districts as authorized by the Germans.

Consumption was then limited to 25 per cent of the tonnage of pig iron and 35 per cent of the tonnage of steel used in 1938.

To solve the problem it is intended to give preference to consumers whose requirements are

Steel, Iron Output in France, October, 1941, Compared with Monthly Average, 1938

(Metric Tons)

	TOTAL, FRANCE (MOSELLE EXCLUDED)			NORTHERN DISTRICT			LONGWY AND ARDENNES DISTRICTS			NANCY DISTRICT			OTHER DISTRICTS		
	Monthly Av., 1938	Oct., 1941	Oct., % of 1938	Monthly Av., 1938	Oct., 1941	Oct., % of 1938	Monthly Av., 1938	Oct., 1941	Oct., % of 1938	Monthly Av., 1938	Oct., 1941	Oct., % of 1938	Monthly Av., 1938	Oct., 1941	Oct., % of 1938
STEEL	574,500	358,000	62	157,000	120,000	76	113,000	23,000	21	93,000	38,500	41	43,000	15,500	36
PIG IRON	314,000	125,000	40	65,000	48,000	74	103,000	22,000	21	69,000	39,500	57	255,500	176,500	65

most urgent for the good of all; to encourage everyone, and to taper off according to lesser needs. Therefore every three months a new survey is made and requirements are satisfied as well as production permits. The tonnage thus made available is distributed by the Office de Repartition des Fers, Fontes et Aciers (Office of Distribution of Steel and Pig Iron), between the various Departments and the Committees of Organization.

To make easier a system of exchange and control, Raw Material Tickets have come into general use. The tickets are warranted by the tonnage of steel and other products available, and bestow a purchasing right. They exist in small notes of different values. Any buyer of raw steel or iron semifinished or finished products must include with his order a Raw Material Ticket, which must cover exactly the weight of the material needed.

The manufacturer of the material must transmit the tickets with his order to the Comptoir to obtain his requisites. The system in general is satisfactory. It is fairly simple and provides means for control and supervision.

Tends Toward Corporate System

Regarding the general organization of industries to meet the new situation which confronts France, more than 100 Committees of Organization have been constituted. They have encountered difficulties in co-ordinating activities, and the tendency has been to reduce the number, and to place them under authority of a General Office of Information and Statistics.

Their work this past year consisted mainly in obtaining census information, means of production, capacities, and notes of other activities. They have been influential in the control of prices of products manufactured by their members, giving or withholding approval of contemplated advances.

In regard to the general organization of the French economy, the tendency still is toward the corporate system. Rules are not yet known, but the first laws related to it are those called the *Charte du Travail*. It states, in principle, that the professional activities are to be divided into a limited number of industrial and commercial "families" composed of organized professions to take care of their interests and to co-operate in the national economy.

Rights, advantages, duties, responsibilities of those concerned are outlined in this charter: Submission to the laws and professional rules, co-operation, solidarity, employers' authority, duty for them to manage their concerns for the common welfare, security of the workers' employment, establishment of social institutions.

A labor charter stipulates that the Committees of Organization continue to deal with economic questions. This labor charter includes social as well as trade organizations, and establishes a double classification of activities:

1. For questions concerning trade matters, trade syndicates are created.
2. For questions concerning social matters, social committees of plants will promote co-operation between employers and workers.

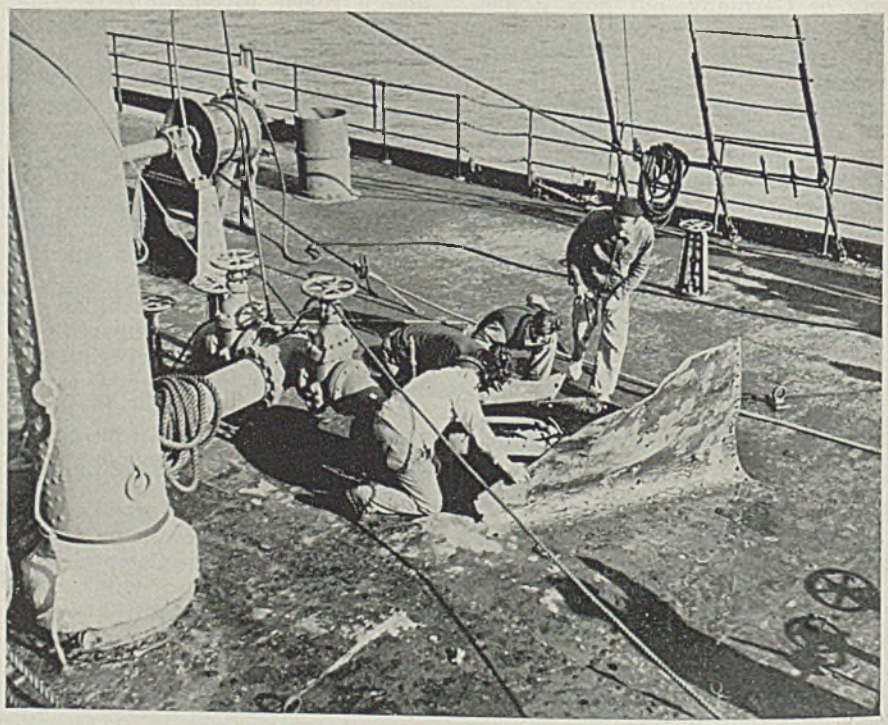
There will be local, district and national syndicates and committees. A labor court will dispose of conflicts.

Living in France is very difficult. Costs are high. Salaries were increased last June 10 per cent but the new rate is low and workers—especially those who live in the large cities—cannot get the necessary food with their wages.

Bread, meat, sugar and many other things are only sold against official "delivery of tickets" but the quantities allowed are small and the public suffers from insufficient and poor quality food. Unemployment is not very important.

The general position of the industries in France is difficult. The aim of everyone is to outlast the war. But many supplies are missing. Very soon many plants will be obliged to reduce their activities or stop.

Tanker Plates Ripped by Axis Torpedo



■ Survivors of the S. S. MALAY, United States tanker damaged by an Axis torpedo off the Atlantic coast, examine the ripped deck plates after the ship limped into Newport News, Va. NEA photo

Revamped War Board's Chiefs Given Full Responsibility and Power

✦

Conversion of 50 industries to arms production planned, with leaders to be named for each . . . Former executive directs automotive changeover . . . OPM faces plentiful in WPB organization

✦

WASHINGTON

"DEBATING societies are out. We are going to have action."

This typifies War Production Chief Donald M. Nelson's aim in abolishing the Office of Production Management and setting up a streamlined organization he believes will put industry into high gear for the manufacture of the implements of combat.

In announcing the new setup, Mr. Nelson declared the time element in supplying arms to the democracies is too important to permit delays of any type.

The new organization contains many of the "hard-hitting executives" of the OPM and to large extent follows OPM's organizational pattern. Chief differences are more centralized authority and increased emphasis on the conversion of civilian goods producing facilities to war output.

Mr. Nelson established six major divisions — purchases, production, materials, labor, industry operations and civilian supply — and placed chiefs in charge of each with full responsibility and ample authority for producing results. Although these executives will avail themselves of the expert counsel which industry and labor committees can give them, they will make the final decisions and see that they are carried out.

"They will have all the power delegated to me by the President," said the WPB chairman.

Conversion of plant facilities, destined to become increasingly important, will be in charge of the Division of Industry Operations, headed by J. S. Knowlson, former deputy director of the OPM Priorities Division. The operations division will initiate conversion plans for entire industries. Then an individual will be placed in charge of executing the changeover of individual plants to war work.

Leading the conversion parade is the automotive industry. Ernest Kanzler, president of Universal Credit Corp., a Ford affiliate, and former production director of Ford Motor Co., has been placed in charge.

Other Industries To Follow

In making the appointment, Mr. Nelson said Mr. Kanzler would have "all the authority I've got to get the job done." He will have power to pool the productive facilities of the industry without regard to corporation lines. Thus, if Ford has tools which can be more effectively used by General Motors, Mr. Kanzler can order those tools transferred.

The war production chief indicated this would be the pattern followed in other industries to be converted, estimated to be about 50 in number. All the industry conversion chiefs will report to Mr. Knowlson.

Mr. Knowlson also will handle priorities.

The other five major divisions bear the same names and have the same chiefs as under OPM.

The Materials Division will be directed by William L. Batt. Its task will be to make the available materials go around, to see that production problems of iron, steel, copper, lead, aluminum and other basic raw materials are realistically met.

Mr. Batt also will direct a requirements committee which will gather information of the needs of the armed services, the Maritime Commission, lease-lend and similar agencies. In conjunction with Mr. Knowlson, the committee will allocate available stocks of materials to the various essential requirements of the war and civilian supply program.

The Iron and Steel Branch of the Material Division will not be affected by the reorganization of the production agencies, according to Charles E. Adams, chief of the branch. Mr. Adams has been reorganizing the branch and probably will announce the new setup this week.

Production Division is in charge of William H. Harrison, "a man hard enough and tough enough to see that a good job is done," in the words of Mr. Nelson. This division will have civilian representatives working directly with the Army and Navy. It will handle subcontracting in a unit replacing the OPM Division of Contract Distribution, formerly headed by Floyd B. Odlum. Mr. Odlum's duties on subcontracting will cease, although he will remain as an economic adviser to Mr. Nelson on matters pertaining to domestic and

foreign production. The new subcontracting unit in the Production Division will be headed by Walter Wheeler, formerly deputy director of the OPM Division of Contract Distribution.

Purchases Division, under Douglas C. MacKeachie, will place representatives in the Army, Navy, Maritime Commission and other agencies to help them in procuring the materials needed. It will take no part in the designing or originating products for the armed forces but will take their requirements and smooth the processes between requests and actual delivery.

This procurement plan gave rise to speculation as to whether or not controversies between the Purchases Division's representatives and the Army and Navy procurement officers might not result, the latter being noted for jealously guarding their power. Mr. Nelson said he did not expect any clashes, but reminded of the President's executive order creating WPB specifying that "federal departments, establishments and agencies shall comply with the policies, plans, methods and procedures in respect to war procurement and production as determined by the chairman (Mr. Nelson)."

Labor Division continues under Sidney Hillman, who is expected to carry on with the program originated under OPM.

Civilian Supply Division remains under Leon Henderson, who also continues as price administrator. Questioned as to the advisability of one man handling two major jobs, Mr. Nelson expressed the "greatest respect" for Mr. Henderson's capacities. "I am sure the two jobs will not be too much for him. If he feels they are, he will tell me."

Seventh Branch To Be Established

A progress reporting agency, headed by Stacy May, also has been established. This will be a planning board which will act as a "brain trust" in originating ideas, but will have no administrative or production responsibilities. Mr. May also will be in charge of statistical information, as he was under OPM.

The legal branch and certain administrative units have been transferred from OPM with the same personnel.

Mr. Nelson indicated a seventh major branch may be established to work in the field and to co-ordinate the work of the present field offices of priorities and contract distribution.

Lieut. Gen. William S. Knudsen will remain a member of the WPB even if Mr. Nelson has to "ask to have the executive order reworded so that he will be eligible technically.

Donald M. Nelson

"General Knudsen is too valuable a man to lose," the WPB chief said. "Although there are representatives of the War Department on the War Production Board now, I think he should be included in the membership so that we can have the benefit of his expert counsel on problems of production."

Mr. Nelson termed the new setup as an "interim" organization and indicated it would be revamped from time to time. Whatever changes are to be made, however, will be made gradually and will be as refinements.

Mr. Nelson's statements and actions indicate he will take full advantage of the great authority delegated to him.

"In approaching this job I have proceeded from the basis that everyone in this country, including labor and management, is interested in only one thing—production of war materials . . .

"I am no super-man. I don't believe in super-men, but if I can do this job, and I think I can, it will be done. If not, I will be the first to admit it and step down."

Mr. Nelson has asked permission to appear before the Senate committee investigating the progress of the armament program. The committee has been caustically critical of the dollar-a-year men.

Demonstrated Ability . . .

■ ALL the officials appointed by Donald M. Nelson in the new War Production Board are veterans in the armament program and were selected "on the basis of demonstrated ability."

♦

J. S. KNOWLSON was appointed deputy director of priorities at Mr. Nelson's request last September and recently has been acting director. He is president and chairman of the board, Stewart-Warner Corp., Chicago, and a past president of the Radio Manufacturing Association. His home is Hinsdale, Ill.

♦

WILLIAM H. HARRISON is on leave as vice president, American Telephone & Telegraph Co. He joined the defense program in Washington in June, 1940, as director of the construction division of the National Defense Advisory Commission, then was named chief of the Shipbuilding and Construction Branch of OPM last January and since September has been director of the OPM Production Division.

♦

WILLIAM L. BATT is president of SKF Industries Inc., Philadel-

Who's Who and Where in Nation's "No-Debating" Team

(Official Diagram of Lines and Place Cards as Issued by War Production Board.)

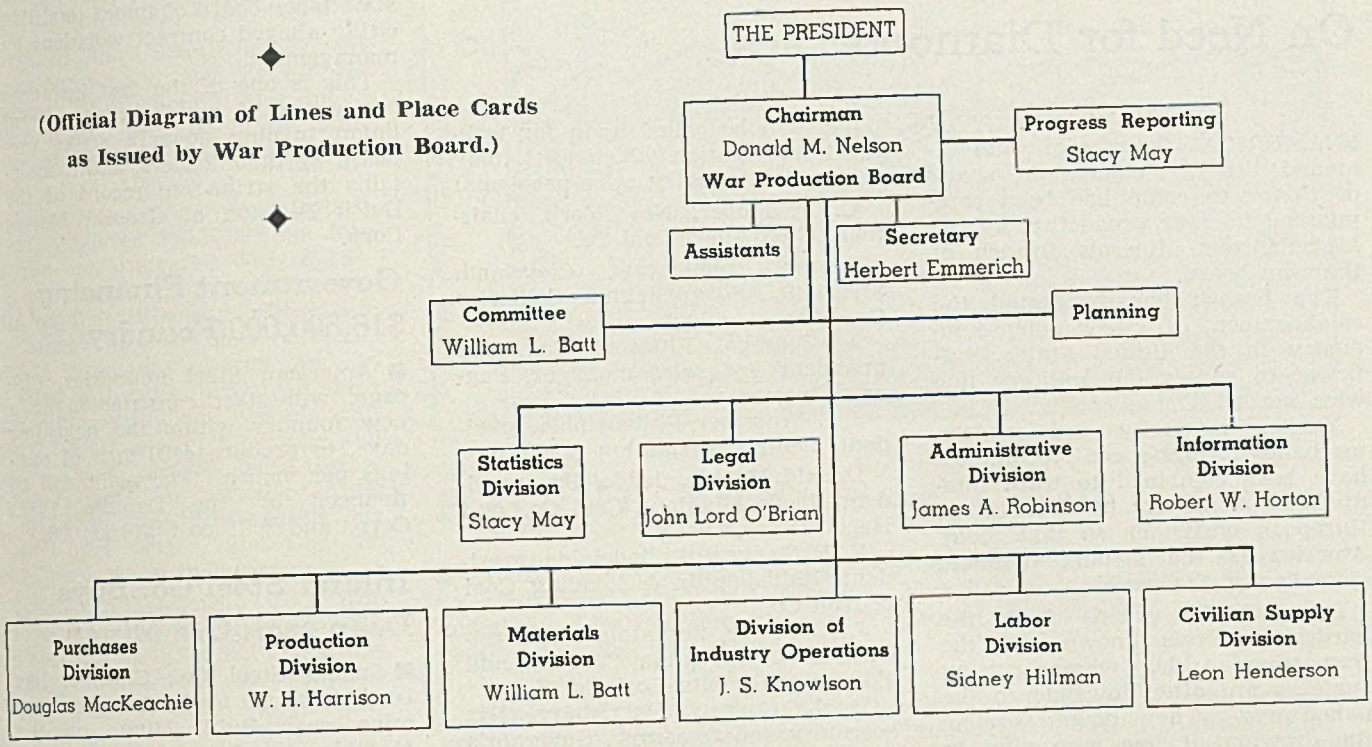


Photo not available at press time.

W. H. Harrison | W. L. Batt | J. S. Knowlson | Sidney Hillman | Leon Henderson

phia. He has been associated with the armament program since June, 1940, as a member of the raw materials division of the NDAC. When OPM was created Mr. Batt was appointed deputy director of the Production Division; last September, he was named director of the Materials Division. He was a member of the President's special mission to Russia and is chairman of the joint United States-Canadian materials advisory committee.

♦

LEON HENDERSON has had a long experience in government service dating from NRA days. He was a member of the Security and Exchange Commission, of NDAC in charge of price stabilization, of OPM, SPAB and is administrator of OPA.

♦

SIDNEY HILLMAN, on leave as president of the Amalgamated Clothing Workers Union of America, has served the government in various capacities since 1933. He was director of the labor division of NDAC, and associate director general of OPM.

Ernest Kanzler
Who will direct the conversion of the automotive industry to full war production

♦

DOUGLAS C. MacKEACHIE was New England purchasing director for the Atlantic & Pacific Tea Co. before becoming associated with the defense program in October, 1940. He was assistant co-ordinator of purchases on NDAC and deputy director and director of purchases on OPM.

♦

STACY MAY has been chief of the Bureau of Research and Statistics since June, 1940, under NDAC, OPM and retains that post in WPB.

♦

JOHN LORD O'BRIAN has been general counsel for OPM, in charge of the legal division. Formerly he was actively engaged in law practice in Buffalo.

New War Industry Built Up On Need for Diamond Dies

WASHINGTON

■ AMERICA'S supply of vital diamond dies that change the shape of things to come has been safeguarded for war production by the Miscellaneous Minerals Branch of the war board.

The branch has facilitated the establishment of a new defense industry in the United States, sufficient to supply our military fine wire needs.

Yankee ingenuity and modern mechanized high-speed techniques have been combined to train hundreds of diemakers by the best of European craftsmen so that today America is the leading diamond diemaker of the world.

Diamond dies, made from the hardest minerals known, are the tremendous trifles whose cutting surfaces are often invisible to the naked eye. They make possible the drawing of fine wire vital in the manufacture of aircraft instruments, high frequency radio tubes, resistance wire in all measuring instruments, electric lights, and inner workings on the dashboards of tanks and bombers.

Until last year, individuals were still manufacturing the dies by perseverance alone, wearing tiny holes in the gems by poking at them with continually sharpened needles for hundreds of hours. Now they are scientifically drilled in whole groups, with new visual inspection aids and high speed electric motors, by craftsmen who have learned in weeks what used to take a lifetime. Overcoming the technical difficulties involved in training workers, the industry now has manufacturers drilling dies below 0.0008, and in larger quantities dies of 0.001 are in constant production. Even spider webs are thicker than tungsten wire from these pierced gems.

The Miscellaneous Minerals Branch gathered all available information first, then studied the technological processes involved in the art of drilling fine dies. As a result, it says, dies previously sought after by the wire drawers of the world are now being matched in quality by the American manufacturers.

Anthracite Producers on Industry Advisory Panel

Eight anthracite producers, representing a major part of the industry, have accepted appointment by the Office of Price Administration to an industry advisory panel. This panel will be called upon for technical information which OPA may require on industry price problems:

C. F. Huber, New York, chairman, Glen Alden Coal Co.

James Prendergast, Cleveland, president, Susquehanna Collieries Co.

J. Tedesco, Pittston, Pa., vice president and sales manager, Pagnotti Interests.

J. B. Warriner, Philadelphia, president, Lehigh Navigation Coal Co.

Donald Markle, Jeddo, Pa., president, Jeddo Highland Coal Co., and Hazelbrook Coal Co.

R. E. Taggart, Philadelphia, president, Philadelphia & Reading Coal & Iron Co.

J. H. Pierce, Scranton, Pa., president, East Bear Ridge Coal Co., and Edison Anthracite Coal Co.

D. L. Corgan, Harrisburg, Pa., secretary and treasurer, Governor's Emergency Committee, Commonwealth of Pennsylvania.

Buick Local Rejects Leaders' Strike Proposal

■ Members of Buick local of UAW-CIO, Flint, Mich., last week rejected a strike vote proposed by their officials. Local officers previously had filed notice with the state labor board of intent to strike, citing alleged contract violations by management.

This is one of the first instances on record of members of a local union turning down a strike proposed by their leaders, and it maintains the strike-free record of the Buick Division of General Motors Corp.

Government Financing $16,500,000 Foundry

■ American Steel Foundries, Chicago, will start construction of a new foundry within the next few days, to produce 4400 tons of castings per month. The plant will be financed by the Defense Plant Corp. and will cost $16,500,000.

Inland Steel Co. Buys Dean Iron Ore Mine

■ Inland Steel Co., Chicago, has bought the fee to the Dean iron ore mine near Buhl, Minn., on the Mesabi range. It is an open-pit truck operation and was opened in 1915 in connection with the adjacent Itasca mine by the Tod-Stambaugh Co., control later passing to the Dean Mining Co.

Dean mine has produced about 6,500,000 tons of ore and has an estimated reserve of 4,000,000 tons. The ore is typical Mesabi analysis.

Automobile Workers Protest Layoffs

■ Three thousand Fisher Body workers last week formed a picket line, marched to the state house at Lansing, Mich., protested against further layoffs in the automotive industry. NEA photo

U. S. Steel Subsidiaries Set Ore, Shipping Records

■ United States Steel Corp. subsidiaries established several all-time records in production and movement of iron ore and in the shipment of limestone and coal during 1941.

Oliver Iron Mining Co., Duluth, Minn., produced 34,127,982 net tons of iron ore, compared with 26,193,055 net tons in 1940. Of this, vessels of the Pittsburgh Steamship Co. brought to lower lake ports 23,542,751 gross tons of iron ore. In addition to this the Pittsburgh ships and other subsidiary vessels carried 7,418,607 tons of limestone and coal. These records were established between the period of April 4, 1941, when the first vessels left their winter berths, and Dec. 12, when they closed their season.

Pittsburgh Steamship Co.'s iron ore tonnage record compares with a movement of 18,713,382 gross tons in 1940 and exceeds the previous record year of 1916 by 3,900,222 gross tons. Of the total iron ore moved during the 1941 season on the Great Lakes, 80,116,360 gross tons, the Pittsburgh Steamship Co. was responsible for about 30 per cent.

Foundry Equipment Sales Index Up in December

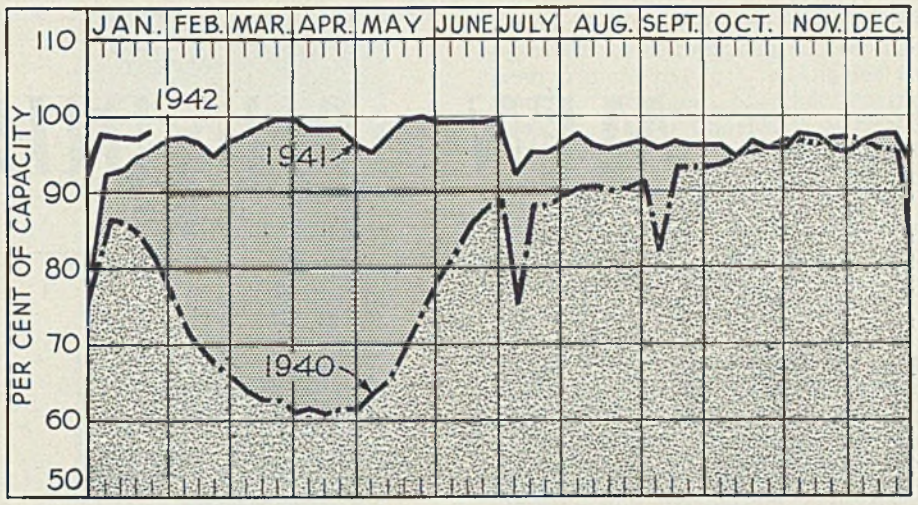
■ Foundry Equipment Manufacturers' Association, Cleveland, reports index of net orders closed on new equipment in December, 1941, was 505.3, compared with 417.4 in November and 414.2 in October. Index for repairs was 408.7, compared with 381.7 in November and 327.2 in October. Total sales index was 481.2 in December, 408.5 in November and 403.8 in October.

Indexes are percentages of monthly averages of sales to metalworking industries, 1937-39.

Work Shop Planned in Cleveland Public Hall

■ Underground sections of Cleveland's Public Hall will become a machine shop for manufacture of ordnance, as the result of a plan being worked out by city officials and Lieut. Col. H. M. Reedall of the local ordnance district. Approximately 160,000 square feet of floor space in the exhibition hall and garage will be made available for working space.

It is proposed to pool machine tools and equipment obtained from small shops and garages throughout the city. Many of these tools are said to be idle at present,



PRODUCTION . . . . Up

■ PRODUCTION of open-hearth, bessemer and electric furnace ingots last week advanced 1 point to 97 per cent. Five districts advanced, four declined and three were unchanged. A year ago the rate was 95½ per cent; two years ago it was 81½ per cent.

Youngstown, O. — Scrap allocations enabled steelmakers here to increase production 2 points to 86 per cent, with 67 open hearths and three bessemers active. One open hearth is scheduled to be added this week. Sharon Steel Corp. plans to relight its relined blast furnace this week.

Chicago—Gained 1 point to 102 per cent, all but one of six producers making increases, largely because of an increased flow of scrap. Several companies could have operated at higher rates if more scrap had been available.

Detroit—Advanced 6 points to 92 per cent as better scrap supply allowed idle open hearths to be lighted. Ford Motor Co. had the best steel production record week since November.

Birmingham, Ala.—Held at 90 per cent for the third week, with 22 open hearths active.

St. Louis—One open hearth was dropped because of scrap scarcity, reducing the rate 5 points to 76 per cent.

Buffalo—Unchanged at 79½ per cent with 34 of 43 open hearths producing.

Cincinnati — Two open hearths taken off because of scrap shortage caused production to drop 3½ points to 88 per cent.

Cleveland—Addition of two open hearths by one interest and an increase by another advanced production 4½ points to 94½ per cent. Maintenance of this level depends on scrap supply.

Central eastern seaboard—Several shifts in active furnaces caused a gain of 1 point to 90 per cent.

New England — Withdrawal of two open hearths reduced operations 15 points to 85 per cent.

Pittsburgh—Continued at 95 per cent for the third week, scrap shortage preventing a higher rate.

Wheeling—Declined 1 point to 88 per cent.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Jan. 24	Change	Same week 1941	Same week 1940
Pittsburgh	95	None	96	78
Chicago	102	+ 1	97	91
Eastern Pa. ...	90	+ 1	96	80
Youngstown ...	86	+ 2	94	68
Wheeling	88	— 1	100	80
Cleveland	94.5	+ 4.5	91.5	74
Buffalo	79.5	None	93	67
Birmingham ..	90	None	100	94
New England..	85	—15	100	75
Cincinnati	88	— 3.5	90	74.5
St. Louis	76	— 5	87.5	83
Detroit	92	+ 6	95	87
Average	97	+ 1	95.5	81.5

Connors Steel Co. Adds Second Electric Furnace

■ Connors Steel Co., Birmingham, Ala., is installing an electric furnace with capacity of 36,000 tons per year, expected to be in production during March. A unit with annual capacity of 24,000 tons has been in service for some time. The new furnace is being built by Pittsburgh Lectromelt Furnace Corp., Pittsburgh.

The company's plant is located at 5000 Powell avenue, Woodlawn, a Birmingham suburb. Its products are bars, strip and small shapes.

MEN of INDUSTRY

■ **L. T. WILLISON** has been appointed manager of ordnance sales, a newly created department, Jones & Laughlin Steel Corp., Pittsburgh. Associated with the company since 1927, Mr. Willison has for some time devoted special attention to steel for shells produced in automatic machines.

♦

Milan Freese, formerly of the sales promotion department of Ohio Seamless Tube Co., Shelby, O., has been named advertising manager.

♦

Robert B. Shepard, since 1924 head of electrical work, Underwriters' Laboratories Inc., Chicago, has been made chief electrical engineer, in charge of all work at Chicago, New York and San Francisco testing stations.

♦

Henry A. Saller has been named a research engineer, Battelle Memorial Institute, Columbus, O., and has been assigned to research in metallurgy. He formerly was associated with Carnegie-Illinois Steel Corp.

♦

E. L. McGraw, formerly director of purchases, Allegheny Ludlum Steel Corp., Pittsburgh, has been named manager of the newly created Scrap and Salvage Department which will be located at the company's Brackenridge, Pa., plant. **E. A. Grine** has been appointed assistant manager of that department.

L. H. Bittner has been appointed director of purchases. Mr. Bittner, who joined the Brackenridge purchasing office several years ago, formerly was purchasing agent at Allegheny Ludlum's Dunkirk, N. Y., plant. He will be assisted by **N. W. Hayson,** who has been made purchasing agent. Both men will make their headquarters at Brackenridge.

L. T. Willison

♦

I. M. Laddon has been named executive vice president and general manager, Consolidated Aircraft Corp., San Diego, Calif. Associated with the aircraft industry since 1917, Mr. Laddon formerly served as vice president and works manager.

♦

James S. Anderson, formerly associated with the Steel & Tubes Division of Republic Steel Corp., in the Cleveland general sales office and more recently with the Philadelphia district sales office, has joined the New York district sales office of Babcock & Wilcox Tube Co., 85 Liberty street, New York.

♦

Martin Eliason, of the Chicago branch of Jessop Steel Co., Washington, Pa., has been appointed representative in the Milwaukee territory, with offices at 419 Colby Abbott building, Milwaukee. Before joining Jessop, Mr. Eliason was sales representative for four years and general superintendent for seven years at the Chicago division of York Safe & Lock Co.

♦

George M. Williams, since 1934 president, Russell Mfg. Co., Middletown, Conn., has resigned to become first assistant to **T. M. Girdler,** chairman of Republic Steel Corp. and also of Vultee-Consolidated Aircraft Corp., San Diego, Calif., during the war. Mr. Williams recently was granted leave of absence by his board of directors and will return to his post at the end of the war.

♦

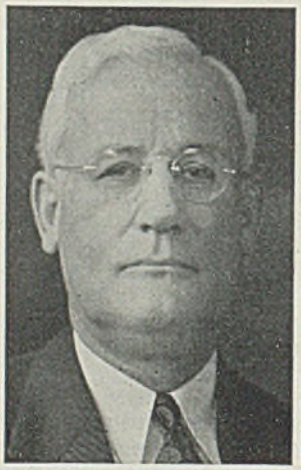
F. H. Cash, formerly in charge of the Minnesota iron ore mines of Republic Steel Corp., has been placed in charge of both the Minnesota and Michigan ore mines of the corporation, in accordance with a reorganization placing all northern ore mines in one operating district. Mr. Cash, whose headquarters will be in Hibbing, Minn., has been with Republic and its predecessor companies for nearly 33 years.

♦

Wallace N. Guthrie has been elected executive vice president and general manager, Cuno Engineering Corp., Meriden, Conn. He has been with the company on a part time basis the past year in connection with work now being done by Stevenson, Jordan & Harrison Inc., New York, industrial and management engineers, of which he is a partner. Mr. Guthrie will now devote his full time to his new position.

♦

Thomas C. Jones, since 1927 manager at St. Louis for Aluminum Co. of America, has been appointed regional manager to co-ordinate



E. L. McGraw

L. H. Bittner

N. W. Hayson

work in the company's bauxite mines and new plants in Arkansas. The company is constructing plants near Bauxite and Hot Springs, Ark., to convert the ore mined at Bauxite into alumina and aluminum.

♦

A. Mosby Harris, assistant superintendent of freight transportation, western region, Pennsylvania railroad, Chicago, has been promoted to division engineer, Renovo division, with headquarters in Erie, Pa. **David E. Smucker,** division engineer at Toledo, becomes assistant superintendent of freight transportation, succeeding Mr. Harris. **Kirk A. Werden,** track supervisor of the Maryland division, succeeds Mr. Smucker at Toledo.

♦

R. C. Hempstead, district master mechanic, Chicago, Milwaukee, St. Paul & Pacific railroad, Milwaukee, has been appointed assistant superintendent of motive power, to succeed the late **P. L. Mullen. A. M. Martinson,** master mechanic, La Crosse, Wis., succeeds Mr. Hempstead as district master mechanic, Milwaukee. **F. L. King** has been named master mechanic at La Crosse.

♦

Harold M. Moore, St. Louis representative of Manning, Maxwell & Moore Inc., Bridgeport, Conn., and a Reserve Army officer, has been called for active duty with the

A. W. Herrington

Who has been elected president, Society of Automotive Engineers, as announced in STEEL, Jan. 19, p. 26. Mr. Herrington is president of Marmon-Herrington Co. Inc., Indianapolis

commission of a captain. He is located at Camp San Luis Obispo, Calif., with the 40th Infantry Division, Field Artillery.

James H. Withers has been appointed a representative of Manning, Maxwell & Moore in the Los Angeles district.

♦

Wallace G. Burbo has been appointed manager, Boston branch office, Ilg Electric Ventilating Co., Chicago. Other promotions in the company's sales organization are: **Charles E. Parks,** formerly manager, Pittsburgh branch office, has been transferred to Los Angeles as district manager of the Pacific Coast territory; **Charles H. Schneider,** heretofore, in the Philadelphia branch office, assumes the post vacated by Mr. Parks, and **W. M. Vernor** has been placed in charge of Houston, Tex., office, under the jurisdiction of **Joseph J. Friedler,** manager of the southern territory.

♦

Herb A. Shutts, research and marketing analyst and authority on the farm market and automotive industry, has joined MacFarland, Aveyard & Co., Chicago, as director of research and marketing. The past three years he has been director of research, MacManus, John & Adams Inc., Detroit.

♦

W. A. Wirene has been appointed assistant sales manager, petroleum, chemical, mining and steel mill section, Industrial Department, General Electric Co., Schenectady, N. Y. Associated with the company about 17 years, Mr. Wirene has been sales engineer of the petroleum and chemical section, Industrial Department, since July, 1940.

♦

Clyde Llewelyn has been named assistant to the president, Bliss & Laughlin Inc., Harvey, Ill. Associated with the company 13 years, he has been in charge of the company's problems pertaining to priorities, allocations, etc., the past 20 months, and he will continue to spend much time in Washington in that capacity.

♦

Lowell Thomas, president, General Smelting Co., Philadelphia, has been elected president, Philadelphia Metals Association. **Joseph Axelrod,** president, Pennsylvania Smelting & Refining Co., has been named vice president, while **Arch Rosenthal** and **John E. Fitzpatrick,** of Joseph Rosenthal Sons, have been re-elected treasurer and secretary, respectively.

♦

Steel Founders' Society Announce New Officers

Steel Founders' Society of America, Cleveland, last week announced the following officers and directors elected, appointed or confirmed at an organization meeting of the board in New York Jan. 14: President, O. E. Mount, American Steel Foundries, Chicago; vice president, L. C. Wilson, Reading Steel Casting Division, American Chain & Cable Co., Reading, Pa.; Mr. Mount, Mr. Wilson and C. L. Harrell, Sterling Steel Casting Co., East St. Louis, Ill., constitute the executive committee.

Oliver E. Mount

Directors include:

Mr. Mount, chairman; Mr. Wilson; D. P. Murphy, Symington-Gould Corp., Depew, N. Y.; Frank M. Robbins, Ross-Meehan Foundries, Chattanooga, Tenn.; C. W. Howat, Continental Roll & Foundry Co., Pittsburgh; F. K. Donaldson, Machined Steel Casting Co., Alliance, O.; M. A. Fladoes, Sivyer Steel Casting Co., Milwaukee; Mr. Harrell; N. K. Anderson, Alloy Steel Metals Co., Los Angeles.

Alternate directors: E. M. Schumo, Pennsylvania Electric Steel Casting Co., Hamburg, Pa.; Ellis Hodge, Erie Forge Co., Erie, Pa.; F. G. Russell, Florida Machine & Foundry Co., Jacksonville, Fla.; T. H. Shartle, Texas Electric Steel Casting Co., Houston, Tex.; T. F. Dorsey, Fort Pitt Steel Casting Co., McKeesport, Pa.; A. A. Stroppel, Sawbrook Steel Castings Co., Cincinnati; Carl Clarke, Monroe Steel Castings Co., Monroe, Mich.; L. J. Wise, Allied Steel Casting Co., Chicago; S. V. Wood, Minneapolis Electric Steel Castings Co., Minneapolis; F. G. Langbein, St. Louis Steel Castings Co., St. Louis; E. L. Knight, Pacific Car & Foundry Co., Seattle; I. L. Johnson, Pacific Steel Castings Co., Berkeley, Calif.

Executive vice president, Col. Merrill G. Baker, Cleveland; secretary-treasurer, R. L. Collier, Cleveland; technical advisor, C. W. Briggs, Cleveland.

Illinois Manufacturers Publish Tax Calendar

Illinois Manufacturers Association, 120 South La Salle street, Chicago, has published a tax calendar to remind members of the dates on which returns, payments and reports required by federal and Illinois laws must be made.

Tax dates are circled in red on a calendar on the front of the four-page circular, while the various taxes are listed on the inside.

Also included is a list of employer forms of Illinois unemployment compensation act and federal old age contribution act.

MEETINGS

Del Monte Theme Centers On War Requirements

■ Eighteenth annual Conference of Iron, Steel and Allied Industries, in Del Monte, Calif., is scheduled for Feb. 12-14. Features of the program include:

Thursday, Feb. 12

9:30 a.m.

"The Steel Industry's Part in This Emergency", by C. B. Tibbetts, vice president, Los Angeles Steel Casting Co., Los Angeles.
"Lincoln," by James Mussatti, general manager, California State Chamber of Commerce, San Francisco.
"War Demands on the Steel Industry" by an official of OPM, Washington.
"Industry's Position in Emergency Readjustments", speaker to be announced.

Friday, Feb. 13

9:30 a.m.

"New Steel Requirements for Merchant Ship Construction", by Capt. H. L. Vickery, U. S. Navy, member U. S. Maritime Commission, Washington.
"Castings in Industry", by H. S. Simpson, president, National Engineering Co., Chicago, and president, American Foundrymen's Association, Chicago.
"Priorities and Allocations", by Col. Wayne Allen, Consultant OPM, on city, county and state purchases, Washington.

Meetings will be held Thursday afternoon grouped under Foundries, Manufacturers and Purchasing Agents, Merchant Steel, Reinforcing, Steel Plate Fabricators, and Structural.

Secretary is C. S. Knight, director, Industrial Department, California State Chamber of Commerce, the association under whose auspices the conferences are held.

National Authority on Labor To Address Association

Information needed in shaping labor policies will be brought to industrialists by J. C. Gall, Washington, who will speak on "Labor Relations in Peace and Wartime" at the twenty-second annual meeting of the Associated Industries of Cleveland, Hotel Statler, 12 o'clock, Jan. 28. Mr. Gall formerly was counsel for the National Association of Manufacturers, New York.

Engineers To Discuss Long-Range Problems

How industrial research can be further mobilized to aid the nation's war effort and what its role will be in the post-war readjustment period will be chief topics at meeting of the Industrial Research Institute, Hotel Savoy-Plaza, New York, Feb. 6-7.

A panel discussion of economic, political and social trends and their possible long-range effects on industrial research policies is noted for the opening session. H. K. Work, manager, research and development, Jones & Laughlin Steel Corp., Pittsburgh, will head the 5-man panel.

Convention Calendar

Jan. 26-28—National Warm Air Heating and Air Conditioning Association. Annual convention, Benjamin Franklin hotel, Philadelphia. William Boeddener, 145 Public square, Cleveland, is secretary.

Jan. 26-29—American Society of Heating and Ventilating Engineers. Annual meeting, Bellevue-Stratford hotel, Philadelphia. A. V. Hutchinson, 51 Madison avenue, New York, is secretary.

Jan. 26-30—American Institute of Electrical Engineers. Winter convention to be held at Engineering Societies building, 33 W. 39th street, New York. H. H. Henline, of this address, is national secretary.

Jan. 26-30—National Canners' Association. Annual meeting, Stevens hotel, Chicago. F. E. Gorrell, 1739 H street, Washington, is secretary.

Jan. 28—Associated Industries of Cleveland. Twenty-second annual meeting, 12:00 noon, Hotel Statler, Cleveland.

Feb. 6-7—Industrial Research Institute. Winter meeting at Hotel Savoy-Plaza, New York. C. G. Worthington, 8 S. Michigan avenue, Chicago, is secretary.

Feb. 12-14—Iron, Steel and Allied Industries. Eighteenth annual conference, Hotel Del Monte, Del Monte, Calif. C. S. Knight, 350 Bush street, San Francisco, is secretary.

March 2-6—American Society for Testing Materials. Thirteenth spring meeting and 1942 ASTM committee week. Hotel Cleveland, Cleveland. C. L. Warwick, 260 S. Broad street, Philadelphia, is secretary.

April 20-24—American Foundrymen's Association. Foundry and Allied Industrial Show, Cleveland Auditorium and Exhibition Hall, Cleveland. R. E. Kennedy, 222 Adams street, Chicago, is secretary.

DIED:

■ **Frederic B. Jacobs,** noted authority on the grinding industry and former editor of *Abrasive Industry,* formerly published by the Penton Publishing Co., Jan. 20, at his home in Cleveland, after a long illness.

Mr. Jacobs was born in South Hingham, Mass., Jan. 5, 1880, of an old New England family. Leaving school at Quincy, Mass., at an early age he learned the machinist trade, becoming skilled as a machinist and toolmaker. In December, 1908, he entered the employ of the Carborundum Co., Niagara Falls, N. Y., as a sales engineer, five years later joining the Abrasive Co. in a like capacity. In 1916 he became a tool designer with Nordyke & Marmon Co., Indianapolis, then assistant chief tool designer, working on tools that built the Liberty motors for the company in World War I.

He joined the Penton Publishing Co. in 1917 on the engineering staffs of *Marine Review* and *Iron Trade Review,* now STEEL, being named editor of *Abrasive Industry* in 1920 and holding that position until 1932. He was with the Cleveland Container Co. as advertising and sales manager in 1933, and in 1935 was employed as a machinist by National Acme Co. In May, 1936, he rejoined the Penton Publishing Co. in the editorial department of *Abrasive Industry,* which was changed to *Abrasives* in 1937. He had patented a number of engineering devices and was the author of five books on the art of grinding and since 1910 he had contributed to trade and technical magazines on engineering subjects.

♦

Frederick E. Fieger, 56, former vice president, Jones & Laughlin Steel Corp., Jan. 16, at his home in Edgeworth, Pa. He joined Jones & Laughlin in 1917 as superintendent of the wire department, and after serving in various capacities was named vice president in charge of operations in 1935, from which post he resigned in 1937.

♦

A. J. Johnson, 50, president, Precision Engineering Co., North Chicago, Ill., in Waukegan, Ill., Jan. 18.

♦

Ethan S. Boone, 59, secretary and a director, W. D. Allen Mfg. Co., manufacturer of brass goods, factory and industrial supplies, Jan. 15, while traveling near El Paso, Tex.

♦

George R. Helmer Sr., 56, for 20 years secretary-treasurer of the former Rochester Brass & Wire Works, Rochester, N. Y., Jan. 11, in that city. He retired in 1932 when the company went out of business.

♦

George A. Saylor, 62, for 20 years western sales manager, Colt's Patent Fire Arms Mfg. Co., Chicago, Jan. 15, in that city.

♦

Herbert Bertrand, president, Elbert Steel Corp., New York, Jan. 16, in that city. Prior to organizing his own company five years ago he was associated with the Crucible Steel Co.

♦

Domestic Manganese Ore Shipments Increased

■ Shipments of manganese ore containing 35 per cent or more manganese, natural, from domestic mines in 1941 are estimated by the Bureau of Mines at 76,000 gross tons, compared to 40,123 tons in 1940. Shipments of ferruginous manganese ore, 10 to 35 per cent manganese, in 1941 are estimated at 459,000 tons, compared with 320,000 tons in 1940.

Manganiferous iron ore, 5 to 10 per cent manganese, was shipped to a total of 820,000 tons in 1941, against 816,541 tons in 1941, it is estimated.

REVISIONS AND ADDITIONS TO

PRIORITIES—ALLOCATIONS PRICES

as published in Section Two of STEEL of Jan. 12, 1942

"M" ORDERS

M-6-b: Nickel, effective Jan. 20, 1942. Restricts use from Jan. 1 until April 1 for certain specified purposes to 50 per cent of consumption in the first quarter of either 1940 or 1941. Curtailment 100 per cent after April 1. Affected uses, except where necessary for operational purposes, are: Transportation equipment; plating; containers of all types; fire-fighting and lighting equipment; building supplies; hardware and ornamental metal work; plumbing, heating and air conditioning supplies; clothing accessories, jewelry, toilet articles, accessories, souvenirs, novelties, games, toys, art objects and musical instruments; branding, marking and labeling devices; decorative uses of all kinds; photographic and art equipment and supplies; sporting goods and pleasure boat fittings; saddlery and harness hardware and fittings. Also affects domestic and industrial appliances, except heating elements for replacement purposes or for use in manufacture of electric ranges, portable heaters and storage type water heaters.

M-47 (Amendment): **Burlap,** effective Jan. 19, 1942. Permits certain manufacturers, such as furniture and textile plants, to process up to and including ten unbroken bales out of stocks. Larger stocks may be disposed of to government or on government orders.

M-62: Sodium Nitrate, effective Jan. 15, 1942. Complete allocation by Priorities Director starts Feb. 1, 1942. Producers and distributors who have not received specific directions covering deliveries by first of the month may make deliveries without limitation, subject to provisions of Priorities Regulation No. 1.

M-65: Cadmium, effective Jan. 17, 1942. Deliveries prohibited except to distributors who during preceding 60 days disposed of cadmium equal to amount on hand at time of delivery; or on orders of A-10 or higher; or unless authorized by Priorities Director. Order M-65-a, effective Jan. 17, 1942, curtails use of cadmium in various specified items during January to amount consumed in January, 1941, prohibits use entirely starting Feb. 1, 1942. Consumption for other purposes in first quarter limited to 70 per cent of like 1941 period, banned completely starting April 1, 1942. Prohibited uses include certain items under following classifications: Automotive, trailer and tractor equipment; building supplies and hardware; home furnishings and equipment; textile equipment and miscellaneous articles.

M-79: Asbestos, effective Jan. 20, 1942. Prohibits, starting Feb. 1, 1942, processing of South African fibre, except to fill defense orders, and of Rhodesian Grade C and G-1 and 2 except to fill defense orders for core roving or nonferrous tapes, cloth and lapps. Also bans processing of grades B-1, B-3 and D-3 amosite asbestos fibre, except to fill certain specified defense orders. Permission of Priorities Director required to install high temperature pipe covering, except for installations of 200 degrees Fahr. or over. Processors must file PD-251 or PD-252 by 10th of each month. PD-253 to be filed upon request.

For additional revisions and additions see STEEL of Jan. 19, p. 30.

"P" ORDERS

P-5-b (Extension): **Material for production of Cranes and Hoisting Equipment,** issued Jan. 21, 1942. Extends P-5-b, issued Nov. 1, 1941, to May 1, 1942.

P-72 (Amended): **Material for elevator, escalator and dumbwaiter repair parts,** issued Jan. 22, 1942. Extends A-3 rating indefinitely to delivery of materials authorized under Production Requirements Plan. May be applied to parts to be used in South and Central America and Caribbean area with filing of separate PD-25a applications.

P-92: Steel Plate and Welding Electrodes, issued Jan. 17, 1942. Assigns priority to deliveries of these materials to training classes for welders under United States Office of Education. Rating determined after application received on PD-183. No more than 30 per cent of plates delivered may be new material.

P-98-a: Petroleum Industry Materials, effective Jan. 21, 1942. Permits use of ratings assigned by P-98, covering priority assistance for production, refining, transportation and marketing of petroleum, by operators outside the United States when specifically authorized by Office of Petroleum Coordinator.

P-107: Repair parts for medium and heavy trucks, truck trailers, passenger carriers, effective Jan. 22, 1942. Assigns A-3 rating to deliveries of material entering into such manufacture.

"L" ORDERS

L-1-c (Amendment): **Trucks, Truck Trailers and Passenger Carriers,** effective Jan. 20, 1942. Permits transfer of title or repossession of vehicle pursuant to installment contract entered into prior to 6 p.m., E.S.T., Jan. 1, 1942.

L-2-f (Amendment): **Passenger Automobiles,** effective Jan. 20, 1942. Permits transfer of title or repossession of vehicle pursuant to conditional sale or installment contract entered into prior to 6 p.m., E.S.T., Jan. 1, 1942. L-2-g, effective Jan. 20, 1942, prohibits manufacture of passenger automobiles, starting Feb. 1, except that operations may continue until Feb. 10 to complete January quota.

L-3-e, L-3-f: Light Motor Trucks, effective Jan. 20, 1942. Imposes same regulations on light trucks as L-2-f and L-2-g apply to passenger cars.

L-4-a (Amendment): **Replacement parts for passenger cars and light trucks** effective Jan. 23, 1942. Production during the first six months of 1942 limited to 150 per cent of number of parts sold for replacement purposes during all of 1941. Does not include parts made on government orders. Covers engine, clutch, transmission, propeller shaft, axles, brakes, wheels, hubs, drums, starting apparatus, spring suspension, brackets and shackles; exhaust, cooling, fuel, lubricating and electrical systems; gages, speedometers, fuses, flares, directional signals, rear-view mirrors, windshield wipers, control mechanisms, steering apparatus and driving gears.

L-35: Spare parts for medium and heavy trucks, truck trailers, passenger carriers, effective Jan. 22, 1942. Limits production quota in first quarter of 1942 to 60 per cent of number sold for replacement purposes in second half of 1941.

PRICE SCHEDULES

No. 67—Machine tools (new), effective Jan. 21, 1942. Maximum prices for dealers and manufacturers are Oct. 1, 1941 lists, or, in absence of such list, last price at which similar articles sold between Jan. 1 and Oct. 1, 1941.

No. 71—Cadmium, effective Jan. 19, 1942. Maximum prices for primary and secondary metallic cadmium per pound delivered are 95c for anodes, balls, discs and other special or patented shapes, 90c for bars, ingots, pencils, pigs, plates, rods, slabs, sticks and other regular straight or flat forms.

No. 72—Fuel oil (Bunker C and No. 6 grade), effective Jan. 9, 1942. Maximum prices are those effective on Jan. 9, f.o.b. refineries and terminals (ex lighterage).

No. 73—Fish meal, effective Jan. 20, 1942.

No. 74—Animal product feedingstuffs, effective Jan. 20, 1942.

No. 75—Dead-Burned Grain Magnesite, effective Jan. 28, 1942. Maximum prices, f.o.b. Chewelah, Wash., are $22 a ton in bulk, $26 a ton in bags or sacks.

GUIDE AVAILABLE

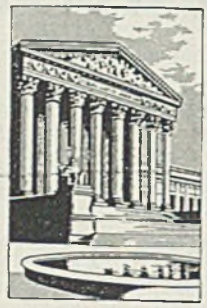
Additional copies of STEEL'S section on Priorities, Allocations, Prices, are available to regular subscribers.

STEEL also has available at nominal prices many of the "PD" Forms which may be reproduced. These are listed on page 10 of the Priorities, Allocations, Prices Section.

Address inquiries to STEEL, Penton Building, 1213 West Third Stret, Cleveland, O.

Windows of WASHINGTON

Henderson sees no inconsistency in limitations on scrap metal inventories and price premiums . . . Survey of copper plants started by WPB to determine compliance with priorities regulations . . . Lead products price regulations modified . . . Standardization of cold-rolled steel sizes sought . . . Tire makers rescind price increases to farm implement makers . . . Machine tool prices frozen at Oct. 1 levels



By L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ LIMITATIONS on nonferrous scrap metal inventories of both fabricators and dealers, as set by the former OPM, and price premiums, established by the Office of Price Administration for shipments of scrap in excess of specified quantities, are entirely consistent with one another, Leon Henderson, OPA administrator, declared last week.

In most finished and semifinished goods, price premiums are customary for smaller shipments because of higher producing and transportation costs, Mr. Henderson explained, adding that the reverse is the case in most scrap materials however, because users find it more desirable to receive large shipments.

He pointed out that users are willing to pay more for large shipments, because they require less handling, and can be more economically routed into production. To the scrap seller, he said, extra expense is involved in assembling and preparing these large quantities. The premium for large quantities covers this extra cost, and affects the additional value.

Scrap metals usually occur originally in rather small quantities, he stated. These small quantities usually are sold to a dealer who combines them to make up a full carload or more, which he sells to a consumer at price slightly higher than at which he has picked up the small lots.

"Since the original maker of the scrap, and the small dealer to whom the scrap may in some cases first be sold, do not have the contacts nor the time and facilities to deal with consumers," it was OPA's intention in framing its schedules to recognize the function of the larger dealer who expedites the movement of material and thus serves both the maker and the user of the scrap.

"For example, OPA set a ceiling price of 10 cents per pound in lots of less than 40,000 pounds of No. 1 copper scrap, and 10½ cents in lots of 40,000 pounds or more. On the other hand, OPM has placed limitations upon the inventories of copper and brass scrap in the hands of dealers and fabricators. Fabricators' inventories are limited to 30 days' production (unless smaller than five tons), and no dealer is allowed to accept deliveries of scrap unless in the previous 60 days he has sold an amount at least equal to his current inventory. These inventory limitations should operate to prevent a misuse of the quantity premiums by small fabricators and small dealers, who might otherwise attempt to hoard materials in order to earn the premium.

"Under present shortage conditions, no person is justified in accumulating more than a minimum scrap metal inventory. If he can possibly increase the speed of movement of his metals inventory, or reduce its size, he should do so."

Priority Aid Granted Oil Firms Operating Outside U. S.

Priority assistance for the production, refining, transportation and marketing of petroleum by firms operating outside the limits of the continental United States is provided by Preference Rating Order P-98-a, was announced last week.

The order permits the use of the ratings assigned by Preference Rating Order P-98 by operators outside of the United States when specifically authorized by the Office of Petroleum Coordinator.

An operator who wishes to use preference ratings under P-98-a must make application to the Office of Petroleum Co-ordinator and receive authorization specifying the kinds and quantities of materials to obtain which the assigned ratings may be used.

When such authorization is granted, the operator will serve a copy of the order with the serial number assigned to him upon each of his suppliers, and the rating may then be applied and may be extended by the supplier by endorsement in accordance with provisions of Preference Rating Order P-98. The countersignature of the district representative of the Office of Petroleum Coordinator is not required on orders which bear a preference rating in accordance with the terms of Order P-98-a. Otherwise, operators and suppliers who extend ratings assigned in accordance with P-98-a are subject to all restrictions and provisions of Order P-98.

WPB Orders Investigations of Copper Fabricating Plants

War Production Board has announced a survey will be started immediately of copper fabricating plants by investigators trained in the copper and zinc branch and compliance section of the former OPM. Survey will cover receipts of primary copper and deliveries of copper scrap, inventories, and other factors to determine whether plants are complying with priorities orders.

OPA Modifies Price Action On Metallic Lead Products

Modification of an earlier request to hold prices of metallic lead products to the levels of Jan. 2, made the same day that the ceiling price of primary lead was raised 65 points to 6.50 cents a pound, New York, is contained in telegrams sent out to 77 producers last week by Price Administrator Henderson.

Telegram asked manufacturers of lead pipe, sheets, type and bearing metals, solders, ammunition, and other metallic lead products not to

exceed prices obtained by taking their April 1, 1941, prices and adding 65 points per pound of lead content in each product. Prices of metallic lead products on April 1, 1941, reflected a price of 5.85 cents a pound for primary lead established five days earlier, in contrast with the present price of 6.50 cents a pound. If products now being made were not priced on April 1, 1941, OPA's approval must be obtained for any price exceeding that in effect on Jan. 2.

Request is not intended to affect firm contracts entered into in the period from Jan. 14 to Jan. 19, inclusive, in accordance with the previous request. Prices determined by applying the method outlined in the telegram are to continue in effect until formal action is taken by OPA. The maximum price later to be decided upon will depend upon the results of studies now under way and may be either lower or higher than the temporary ceiling.

Study Standardization of Cold-Rolled Steel Sizes

Standardization of cold-rolled steel sizes was discussed last week by cold-finished steel producers and government representatives under the auspices of the OPM Iron and Steel Branch.

Problems discussed included the interests of the armed forces in having many sizes of steel for shells, the determination of what sizes and grades of steel are regularly distributed and the sizes of cold steel units distributed at present, so that manufacturers and government representatives can eliminate unnecessary sizes to reduce costs throughout production.

A committee from the American Steel Warehouse Association attended the meeting. Others included representatives of the Army, Navy, and the subcommittee of cold-finished bars, Iron and Steel Branch, and Bureau of Industry Advisory Committees, OPM.

Farm Implement Tire Price Increases Are Rescinded

Price increases in original equipment tires for farm machinery, established by the "Big Four" tire producers as of Jan. 1 have been voluntarily rescinded, following a request made by OPA that these firms make this "your contribution to stable farm prices."

Firestone, Goodrich, Goodyear and U. S. Rubber Co., also agreed to OPA's suggestion that they re-bill at former prices all sales of original equipment tires for farm machinery made since Jan. 1.

Farm machinery manufacturers had indicated the necessity of raising their farm equipment prices to pass on to the consumer these Jan. 1 tire increases.

South African Asbestos Under Priority Control

South African asbestos has been placed under strict priority control by Conservation Order M-79 curtailing the uses of certain types of asbestos. It takes effect immediately.

Order prohibits the use of South African asbestos after Feb. 1, except to fill defense orders, and permits its use to fill orders for specified purposes only.

Unless specifically authorized, after Feb. 1, no one shall process any Chrysotile asbestos fiber unless necessary to fill defense orders for core roving or nonferrous tapes, cloth and lapps.

Prohibitions are also placed by the order on processing grade B-1 amosite asbestos fiber except to fill defense orders for woven felt blankets and mattresses for marine turbine insulation. Nor shall anyone process grade B-3 or D-3 amosite asbestos fiber unless to fill defense orders for turbine insulation blankets, fireproof board, sprayed amosite, welded amosite pipe covering and blacks, 85 per cent magnesia pipe covering, flexible amosite pipe insulation or dry pack insulation. The order prohibits installing without specific authority any high temperature pipe covering unless used where temperatures of over 200 degrees Fahr. occur.

Anyone processing asbestos fiber must file all information required on form PD-251 or PD-252 by Feb. 10, and by the tenth of every calendar month thereafter.

Cincinnati Industries Plan 56-Hour Week

CINCINNATI

■ Proposals for a round-the-clock production schedule received approval from 150 representatives of war industries in this district.

Program was submitted by George A. Seyler, vice president, Lunkenheimer Co.; Willets Peaslee, Cincinnati Milling Machine Co.; and Fred Schoeffler, Lodge & Shipley Machine Tool Co.

It calls for a 56-hour, six-day week, each worker to put in 16 hours overtime. Utilizing units of three men, the program enables one to be off duty Saturday, another Sunday, and another on Monday. On off days the other two men would each work 12-hour shifts. On other days each man would work eight hours.

Employment of women also was considered in the conference.

Machine Tools Price Ceiling At Oct. 1 Levels

■ MAXIMUM prices for new machine tools have been fixed at Oct. 1, 1941, levels by OPA in Price Schedule 67, in accordance with an understanding reached at a conference Jan. 7 between OPA officials and 300 machine tool manufacturers.

Schedule forbids sales of tool or extras after Jan. 20, by either builders or dealers, at prices in excess of those listed Oct. 1; if there were no list price on that date, the maximum is set at the price of the last sale for similar item between Jan. 1 and Oct. 1.

Existing price arrangements in government or defense contracts are not disturbed by new schedule.

Machine Tool Shipments $85,100,000 in December

■ Machine tool shipments in December, 1941, were valued at $85,100,000, the highest volume of any month in the history of the industry, National Machine Tool Builders' Association reports. Output for the year reached $775,300,000, compared with $450,000,000 in 1940.

The association estimates the number employed in machine tool building at the end of the year exceeded 110,000, against an estimated 78,100 in December, 1940.

Pittsburgh Steel May Construct New Stack

■ Another new blast furnace may be built in the Pittsburgh district if plans of the Pittsburgh Steel Co., already approved by the government, materialize. Financing of the program, which also includes some extensions to open hearth facilities, has not yet been arranged.

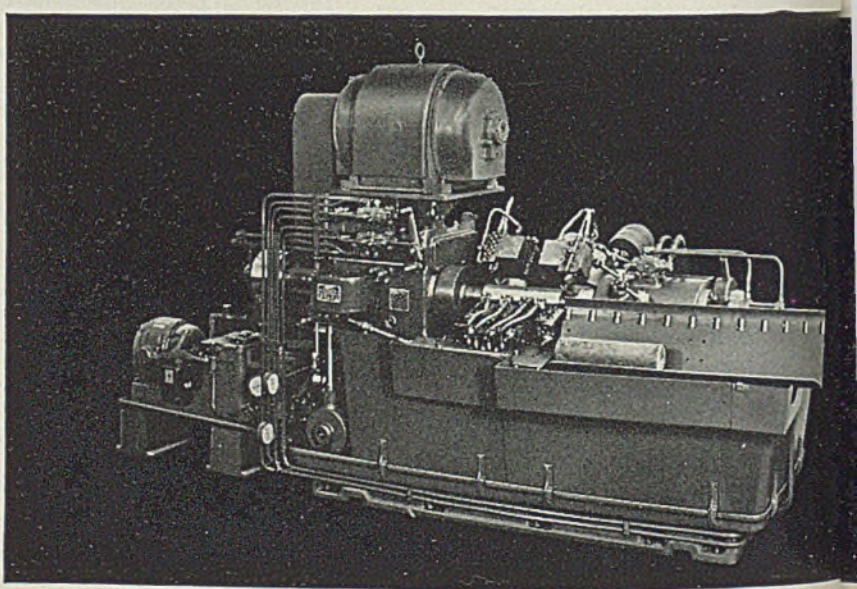
New facilities would be used to augment the company's available raw materials supply in the production of wire and pipe items for the war effort. Among the items cited are aircraft tubing, pins for tank treads, barb wire, and miscellaneous aircraft parts.

Also included in the company's expansion program is a new department for production of tubular railroad axles, privately financed, and improvements to its power plant. A bank of by-product coke ovens, financed by the government, is now nearing completion.

"PLEASE POST THIS IN

"The Lamson Catalog of 1865"

NEITHER Jones & Lamson nor its early predecessors has ever been backward about keeping industry informed of the newest developments in their machine tool line. When American missionaries were first bringing the Bible to heathen lands, Vermont machine tool men afoot, on horseback, flatboat and stagecoach were tooling infant industries on the frontiers of America. Sometimes these hardy salesmen ran out of cash on the road. One of them labored for weeks as a bartender in a hotel to earn money to travel on. Today Jones & Lamson representatives travel by auto, rail and air, but they are no less eager than their predecessors to bring you information of new ways to speed production.



Jones & Lamson 16" Fay Automatic Lathe tooled to machine a shell.

AUTOMATIC THREAD GRINDERS

OPTICAL COMPARATORS

RAM TYPE UNIVERSAL TURRET LATHE

A CONSPICUOUS PLACE"

THE machines shown in this catalog are no longer made. But there is one item worth remembering that can help you meet today's emergency and safeguard future earnings in postwar competition.

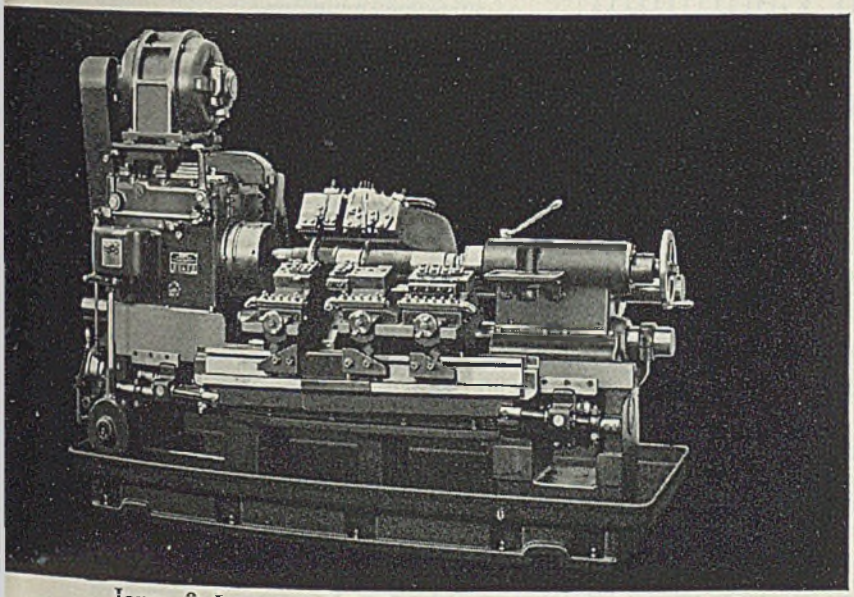
Now, as in 1865, Jones & Lamson equipment offers advances in machine design and precision workmanship that enable you to take every possible advantage of available cutting tools.

Specifically, Jones & Lamson Turret Lathes, Fay Automatic Lathes and Automatic Thread Grinding Machines embody numerous refinements that make for rapid, effortless low-cost operation. Into them are built excess reserves of speed, rigidity and *useful* power that permit maximum employment of any hard alloy tool or high speed grinding wheel now made, or likely to be made in the near future.

Detailed information of these features is available in the newest illustrated Jones & Lamson catalogs. Inquiries from large plants or small receive careful study here. It pays to put production problems up to Jones & Lamson engineers.

JONES & LAMSON

MACHINE COMPANY · Springfield, Vermont, U.S.A.

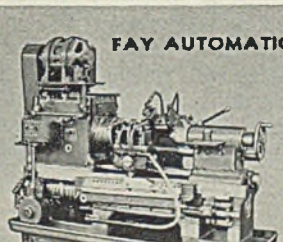


Jones & Lamson 16" Fay Automatic Lathe tooled to machine a rear axle housing.

Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Thread Grinding Machines . . . Comparators . . . Automatic Opening Threading Dies and Chasers

SADDLE TYPE UNIVERSAL TURRET LATHE

FAY AUTOMATIC LATHES



PROFIT PRODUCING MACHINE TOOLS

Restrictions On Nickel Tightened; Use in Many Items Prohibited

■ LOOPHOLES in priority control of nickel by which some secondary metal and nickel already in fabricators' inventories has been escaping into less essential uses have been plugged with the issuance of Conservation Order M-6-b.

Primary nickel has been under complete allocation since May 15, 1941, but control over scrap has been less rigid. The new order lists many items in which nickel cannot be used after April 1, and contains other restrictive provisions designed to conserve the metal for war production. Use of nickel in the items listed must be reduced to 50 per cent of a 1940 base period between Jan. 1 and March 31.

Use of the metal, except where necessary for operational purposes, is prohibited in the manufacture of transportation equipment, plating, containers of all types, fire-fighting equipment and lighting equipment. "Operational purposes," it was explained, will be strictly interpreted. Where any other metal will serve, even though nickel is preferable, the substitute metal must be used.

Nickel cannot be used at all for the manufacture of building supplies, hardware and ornamental metal work; plumbing, heating and air conditioning supplies; clothing accessories, jewelry, toilet articles, accessories, souvenirs, novelties, games, toys, art objects and musical instruments; branding, marking and labeling devices; decorative uses of all kinds; photographic and art equipment and supplies; sporting goods and pleasure boat fittings, and saddlery and harness hardware and fittings.

Home and office furnishings and appliances and commercial and industrial appliances also come under the general prohibition, except for heating elements for replacement purposes and in the manufacture of electric ranges, portable heaters and water heaters. The usual nickel-plated home electric appliances are included in the prohibition.

Exceptions to the order are the usual ones of government orders, safety regulations and priority ratings of A-1-k or higher.

Uses of nickel not specifically mentioned in the order are limited to OPM allocations of a specific amount of metal allocated for a definite purpose. Stocks on hand will be taken into consideration in making allocations and secondary metal will be included in such inventory consideration.

Strict Control Imposed on Cadmium

■ STRICT control over the distribution and use of cadmium has been effected through Orders M-45 and M-65-a.

M-65 invokes Priorities Regulation No. 1 and directs all deliveries of the metal. Deliveries are restricted to distributors, on preference ratings of A-10 or higher, or on specific authorization. A distributor may not accept delivery unless he has in the preceding 60 days, disposed of cadmium equal in weight to his inventory on the date of delivery.

M-65-a prohibits the use of cadmium in the manufacture of a long list of articles, attached to the order as List "A," effective Feb. 1. Use of the metal in these articles in January must not exceed the amount used in January, 1941.

Users of cadmium not on the list and not otherwise covered by the order are given until March 31 to continue manufacture. Seventy per cent of the amount used in the first quarter of 1941 may be consumed. After April 1 all use of cadmium not specifically permitted by the order must cease.

Permitted uses of cadmium are for certain government agencies, to comply with underwriter and safety regulations, on preference ratings down as far as, but not including, A-2, and on items in List "B" of the order.

List "A," the prohibited items, includes automotive, trailer and tractor equipment, building supplies and hardware, house furnishings and equipment, textile equipment and a number of miscellaneous uses.

List "B," items not covered by restriction, are chemicals, electrical fittings and contacts, electroplating of textile equipment, alloys in fire protection systems, measuring, recording and control devices, and solders.

Approximately 75 per cent of the essential use of cadmium is for plating as a preventative of rust. Its war uses are for vital parts of airplanes where rust might develop, and for instruments in planes, tanks and ships. It also is used for locks on ammunition cans where rust might interfere with rapid opening of the lock.

Formal price ceilings on primary and secondary metallic cadmium are established in Price Schedule No. 71 issued by OPA. Maximums set are 90 cents per pound, delivered buyer's plant, for sticks and 95 cents for anodes and special shapes. This move is necessitated by excessive prices for secondary cadmium.

Priority Aid Granted for Supplies for Welding Students

Priorities assistance has been granted for deliveries of steel plate and welding electrodes used in the operation of defense training classes for welders under the United States Office of Education.

Preference Rating Order P-92 was issued to carry out the program.

No specific preference rating is assigned to deliveries of steel plate and welding electrodes. The rating will be determined from time to time. An application form (PD-183) has been drawn up for this purpose.

The Office of Education is training more than 15,000 welders in vocational schools throughout the country in order to fill demands for war industries. Some of these defense training classes have had difficulty in obtaining steel plate and welding electrodes for necessary practice work by students and in some cases classes have been curtailed or stopped.

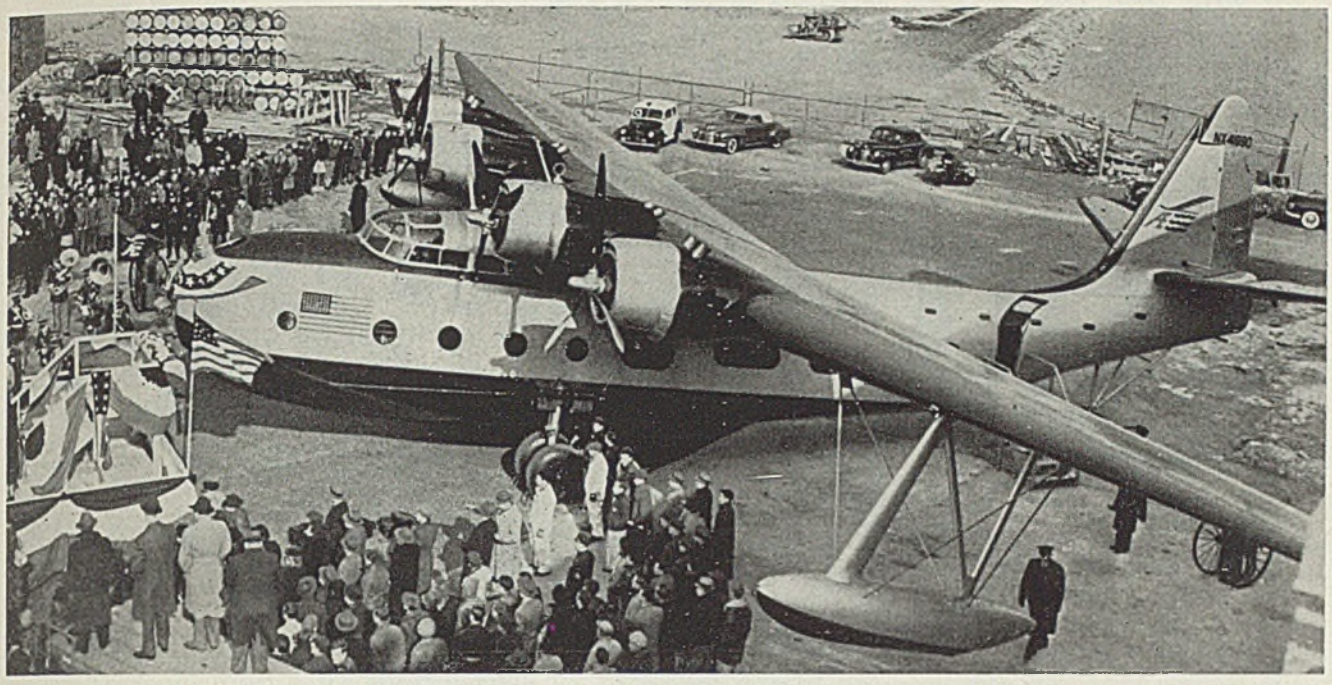
However, no more than 30 per cent of the steel plate to be delivered under a preference order can be "new" plate, which plate will be used only for testing the proficiency of welding students.

Copper Products Manufacturers Warned To File Form PD-189

Manufacturers of copper products have been warned that if they are using copper or copper base alloy in the manufacture of articles on list "A" of order M-9-c and have not filed Form PD-189, they are in direct violation of law and must file the form immediately.

List "A" includes more than a hundred less essential civilian items. The use of copper in the manufacture of these items is prohibited after March 31, 1942. Manufacture is permitted from Jan. 1 to March 31 under certain conditions.

The extension in time to March 31, afforded by paragraph (A) (4) of the order is not available to manufacturers unless each of the four conditions set forth therein, one of



STRATFORD, CONN: The Excalibur, designed to have the lon jest range of any flying boat yet built, was christened at the Vought-Sikorsky plant here last week by Mrs. Henry A. Wallace, wife of the vice president. It is the first of three being constructed for American Export Airlines for trans-Atlantic service. NEA photo

which is the filing of Form PD-189, is met.

Domestic Zinc Industry Expands for War Needs

■ Slab zinc production in 1941 totaled 864,000 net tons, compared with 706,100 tons in 1940, according to a review of the industry by the American Zinc Institute Inc., New York. Facilities were increased steadily during the year and output rose from 66,121 tons in January to 78,635 tons in December. At the end of the year it was at the rate of 926,000 tons annually, more than double that of 1938.

The 1941 supply was increased by about 18,000 tons of redistilled secondary metal and 36,000 tons of imports, principally from Mexico. This brought total supply of slab zinc available in 1941 for domestic consumption and export to 918,000 tons. About 10,000 tons of remelted zinc is not included.

Foreign supplies of concentrates were relied on to meet most of the additional needs of smelters and refiners. Concentrate imports on the basis of entries during the first nine months were at the rate of 240,000 tons of zinc content for the year. Bureau of Mines estimates total domestic mine production in 1941 was about 10 per cent over the output of 1940, which was 665,068 tons of recoverable metal.

Slab zinc price was 7.25c per pound, East St. Louis, for prime western, until Oct. 10, when an increase of one cent was approved.

Domestic consumption in 1941 totaled 751,943 tons of slab zinc, an increase of 11.46 per cent over 1940 total of 674,615 tons. In addition, 105,603 tons was exported, compared with 88,165 tons in 1940. Unfilled orders Dec. 31 were 87,666 tons, compared with 125,132 tons Jan. 1. Slab zinc stocks at smelters were 17,582 tons at the beginning of the year, dropping to the low point of 10,644 tons at the end of February and gradually increasing to 24,062 tons Dec. 31.

Ratings for Aircraft Materials Extended for Two Months

Preference rating orders granting priority assistance in obtaining materials entering into the production of airplanes, airplane engines and equipment, electrical relays and solenoid assemblies, radio receiving, transmitting and directional equipment have been extended two months, to March 31, 1942.

Priorities Established for Commercial Airline Travel

Cargo and passenger priorities for air line travel were established last week by Brig. Gen. Donald R. Connolly, military director of civil aviation. In announcing the schedule the War Department said reservations for seats and cargo space would continue to be made through the lines regularly established agencies but that seats would be assigned "only after those that may be required for official use have been billed."

Entitled to priority are:

1. White House personnel.
2. Army, Navy and Marine Corps ferry command pilots traveling under orders.
3. Personnel of the armed forces and allied military missions whose orders direct travel by air.
4. Army and Navy equipment, ammunition, supplies and material essential to the war program.
5. Personnel of government departments and agencies whose activities are essential.

In a memorandum to government departments, General Connolly requested that great care be taken to limit air travel priorities "to those cases where air travel is essential."

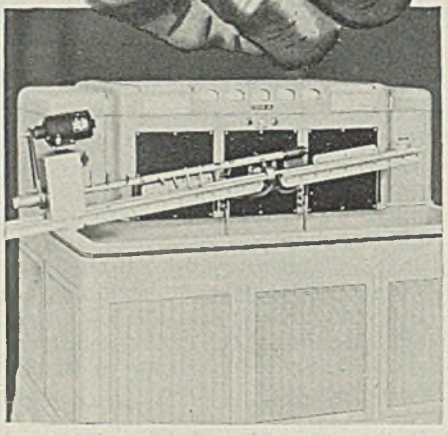
Silver Producers Seek New Uses in Industry

■ American Silver Producers' Research Project, represented by Handy & Harmon, 82 Fulton street, New York, announces that silver in a variety of forms has been made available without charge, on a consignment basis, to responsible manufacturers for research.

An objective is to develop new industrial uses, in addition to the many which have appeared in the past few years. Within the past decade use of silver by industry has increased several million ounces annually. It is taking the place of several metals not available for nondefense use, especially where material cost is low in relation to total cost.

Information concerning silver and its uses, much of it the result of research, has been gathered by the project and is available to interested manufacturers.

Let's SPEED UP your HEAT-TREATING!



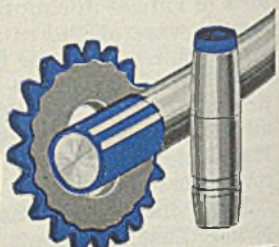
UP 233%. Here, TOCCO eliminates 9 production steps in hardening a compressor part, boosts production from 24 to 80 parts per man-hour. Cuts costs 75%. Simple push-button operation.

CUTS 8-HR. CYCLE TO 36 SECONDS. Here, TOCCO hardens wearing surfaces only of 36-inch, 6-bearing rocker shafts in 36 seconds, eliminating 8-hour carburizing cycle. Minimizes distortion. Automatic control eliminates necessity for skilled operator.

UP 600%. Here, TOCCO hardens wearing sections of drill chuck bodies at a 600% gain in output per operator-hour over former method. Elimination of rejects due to distortion saves $7300 per year.

Find out how TOCCO can speed up and improve your heat-treating output!

SPEEDY ELECTRIC HEAT IS GENERATED WITHIN THE PART OR SECTION TO BE HEAT-TREATED



THE OHIO CRANKSHAFT COMPANY
Cleveland • Ohio

TOCCO
World's Fastest, Most Accurate Heat Treating Process

Mirrors of MOTORDOM

Quartermaster corps ordering 128,000,000 screws and bolts for army truck maintenance. Will tax resources of producers to supply enormous total . . . Disposal of new cars and tires according to rationing plans to create many hardships and inequities . . . Ford accelerating war production program, taking on new work . . . Plants have "forgotten automobiles until victory is assured"

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ AN EXAMPLE of government procurement which has a large part of the screw and bolt industry here groggy trying to comprehend is the inquiry which originated in this district for the motor transport section of the quartermaster corps, covering repair and replacement needs of army trucks on screws and bolts. The inquiry, subsequently placed according to latest information in the industry, encompassed the stupendous total of 891,000 *gross*, or 128,304,000 pieces, up to about ½-inch diameter, 3-inch length, and in about 250 different shapes and sizes.

Authoritative sources in the screw industry are guessing the inquiry must have been prepared, not by consulting any original truck equipment list, but probably by simply copying down sizes out of a screw catalog, since many of the sizes are not even used in trucks, and the quantities specified are so enormous that how they can ever be used up by the Army's truck fleet of several hundred thousand vehicles is completely mystifying.

Increases Industry's Burden

Deliveries specified on the inquiry were from 90 to 120 days, and all screws were required to be packaged in single-gross boxes. A rough estimate indicates it would require a whole trainload of freight cars to accommodate the shipment, which is destined for eight quartermaster depots throughout the country.

The load which this throws on the already heavily burdened screw and bolt industry, now working day and night on vitally needed aircraft and related material, can scarcely be imagined. Quantities of some sizes exceed what the entire industry produced in the last five years, according to one source.

Many other complicating factors appear in connection with the business. Large quantities of steel will be required. All pieces must be cadmium plated, which will make terrific inroads on the restricted cadmium supply of the country. Years hence, after boxes of unused bolts have reposed undisturbed on depot shelves, they will have to be thrown on the market as distress merchandise, which will lead to an inter-industry price-cutting war and heckling with which this industry already is too familiar. Each depot probably will have to erect a new building to accommodate its consignment of screws and bolts.

The questions the industry are asking are these: If this is typical of war-time procurement, is not the same situation liable to be present in other products besides screws and bolts? And is it not a contributing cause of the huge cost of the war effort? And why could not representatives of the screw industry and the truck industry have been consulted as to probable replacement needs and then their estimates multiplied by a safety factor of four or five to determine the number to be ordered? And further why was the business placed item by item, instead of apportioning quantities to the various producers according to their available facilities for production and packaging? Experienced parts buyers in the automobile industry, which in a good year will use a couple of hundred million screws, follow the policy of distributing their business among several producers. Why not the same pattern for the Army?

One possible reason for this apparent overbuying on the part of the quartermaster corps is that contracts under $1,000,000 may now be let from district offices rather than from Washington; and this screw and bolt contract will amount to less than the limit. But certainly Washington officials must be aware of the transaction. It is without any doubt the largest single inquiry ever dropped into the laps of the industry in its entire existence, and it has had some pretty fair-sized inquiries in its day.

Car Assemblies Slated To Halt for Sure Jan. 31

First result of the appointment of Donald M. Nelson as czar of the war effort was a dimming of the importance of the seven-man industry-labor automotive committee, and the centering of control of the industry's war program in Ernest C. Kanzler, who headed the OPM's automotive branch and formerly was chief of Universal Credit Corp., a Ford affiliate. Also it became apparent that production of passenger cars and light trucks must be stopped at midnight Jan. 31, although the loophole of special permission to continue assemblies until Feb. 10 is provided.

The Washington experts now dope the outlook about like this: The 450,000 new cars now in dealers hands will be rationed to the military services and approved civilian and government buyers, while the 130,000 passenger cars produced this month will be stored for one year and then rationed, with dealers being reimbursed for storage costs on the basis of about $15 a month. Dealers likely will be reimbursed as well for storage costs on cars now jammed into their display rooms and "frozen" since Jan. 1.

Many of the cars being assembled this month are without tires, or else equipped with used tires. One plan suggested has been to supply tireless cars to customers on ration, then require them to buy tires for their new cars under rationing terms as well. On top of that, these ration-weary individuals will have to prove their case to state license bureaus which are not inclined to issue any 1942 plates for new cars.

The problems involved in this ra-

tioning program are tremendous and almost impossible of equitable solution. For example, Michigan dealers now are estimated to have better than $14,000,000 worth of tires and tubes in stock, on the basis of "floor taxes" paid the state in recent months. According to present rationing quotas, these same dealers are permitted to release about $200,000 worth of tires a month, so they have stocks which theoretically would last six or seven years.

Other disconcerting angles include the statement by a rubber company executive that the country has ample supplies for both military and civilian needs to last better than two years, by which time the synthetics may be in the picture, or the supply routes to the East reopened. Then the Brazilian foreign minister in a radio speech said that if this country would pay only half the present price of synthetic rubber, or 60 cents a pound, instead of the 30 cents being offered, there would be a rush to the 20,000,000 wild rubber trees in Brazil which would provide rubber in a hurry.

Auto dealers meeting in Chicago last week for their annual convention got a wry laugh from reports that one of their brethren in Indianapolis had stocked up his showroom with radios, stoves, bicycles and whatnot, and advertised, "You can buy anything here but a new Buick."

War Effort Disrupts Normal Pattern of Activity

As each day passes, the redoubled efforts of Ford to speed up war production and to shoulder an increasingly heavy load are emphasized. The normal pattern of events is no more. Greenfield Village has been closed to visitors. The Ford Sunday evening radio hour will stop March 1. So busy are the Ford administrative offices that telephone callers frequently receive the busy-signal from the large switchboard.

Steelwork for the new Ford armor plate plant has been awarded to Whitehead & Kales. It is reported a bessemer converter will be installed in the open-hearth plant as a preliminary to more extensive bessemer installations elsewhere. The Highland Park plant is being equipped to supply certain tank subassemblies and power lines were changed recently from 220 DC to 220 AC for a new manufacturing program which at present is known only as the "Sperry job." Machine equipment, including a number of profilers with high-speed spindles, is now on order for this job, apparently for production of some type of armament instrument designed by Sperry Gyroscope or Sperry Products in the East. Three other plants in this area also are tooling for production of some sort of "Sperry" equipment. They are Vickers (owned by Sperry incidentally), the Hudson naval ordnance plant and AC Spark Plug at Flint.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1939	1940	1941
Jan.	356,962	449,492	524,058
Feb.	317,520	422,225	509,326
March	389,499	440,232	533,849
April	354,266	452,433	489,854
May	313,248	412,492	545,355
June	324,253	362,566	546,278
July	218,600	246,171	468,895
Aug.	103,343	89,866	164,792
Sept.	192,679	284,583	248,751
Oct.	324,689	514,374	401,360
Nov.	368,541	510,973	373,892
11 mos.	3,219,748	4,188,808	4,806,443
Dec.	469,118	506,931	.....
Year	3,732,718	4,692,338	.....

Estimated by Wards Reports

Week ended:	1941	1940†
Dec. 27	24,620	82,545
Jan. 3	18,530	76,690
Jan. 10	58,990	115,935
Jan. 17	75,025	124,025
Jan. 24	79,930	121,948

†Comparable week.

Pontiac Will Undertake New Gun Assignment

In appropriate ceremonies, the Pontiac Motor division of General Motors was awarded the Navy Department ordnance flag and "E" pennant last Tuesday for "outstanding production of Navy materiel." Already production of Oerlikon antiaircraft guns for ship installation has been doubled and redoubled, according to H. J. Klingler, general manager of Pontiac. He added that additional assignments have been taken on which will place the plants on a 100 per cent war basis. One of these, according to information in the trade, is production of the 40-millimeter Bofors antiaircraft gun of the type now being supplied by Chrysler Corp. The latter, incidentally, is sighting on a production goal on the Bofors gun of 3000 a month.

Speaking at the Pontiac ceremony, R. H. Grant, in charge of General Motors' war work, said, "We have forgotten about automobiles and will not think of them again until Victory is assured. Every machine, every lathe, every employe now is consecrated to the production of more and still more guns and tanks and planes and shells. General Motors has become General Armorers."

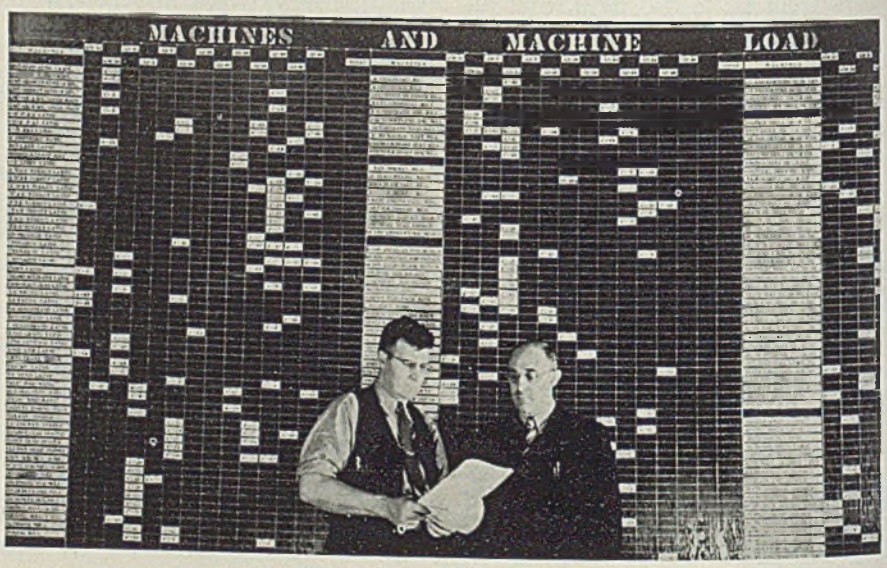
Idle Tool Lists Out Soon

First general meeting of the Automotive Council for War Produc-

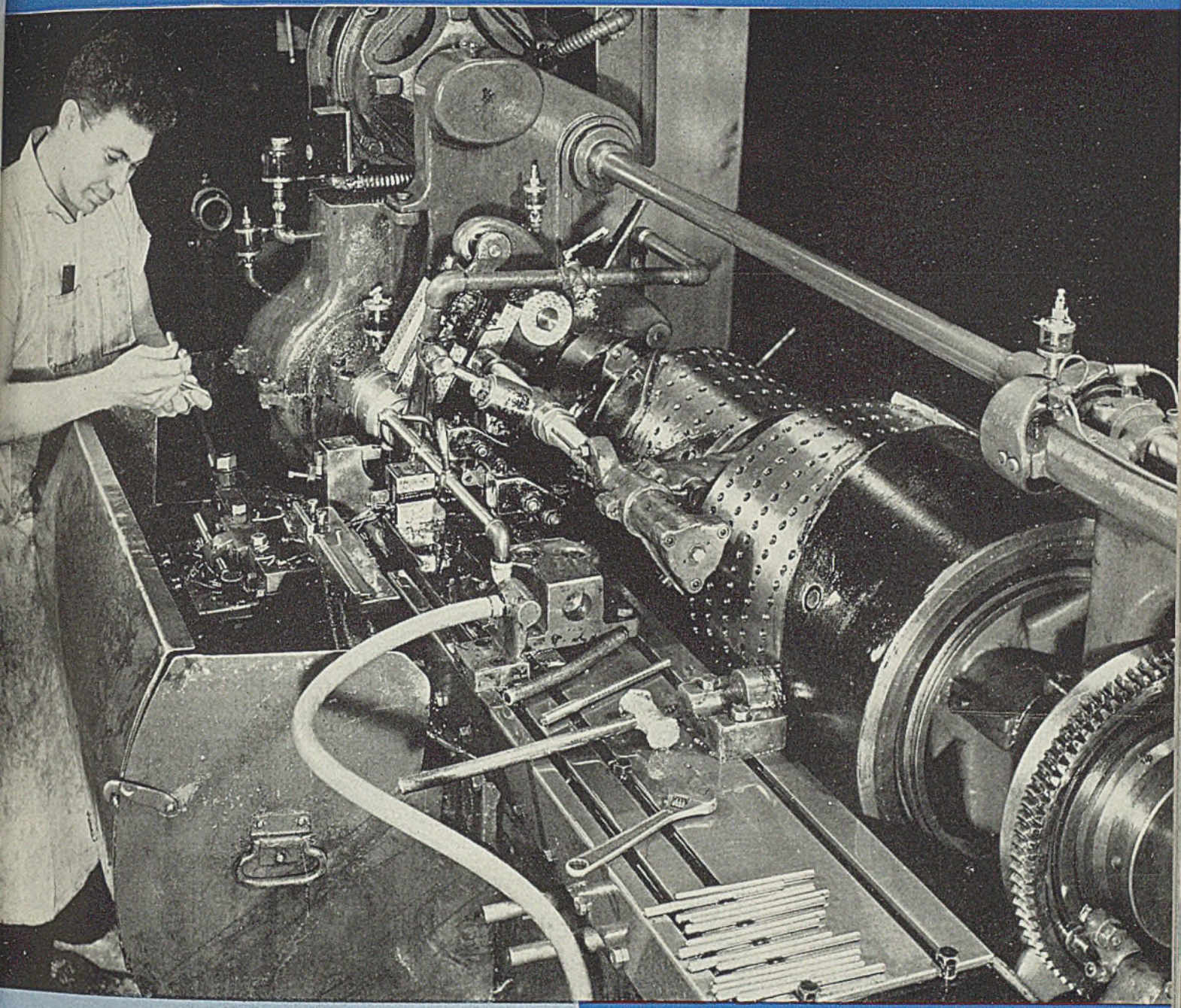
(*Please turn to Page 42*)

Equalizing Machine Tool Load at Allison Plant

■ Keeping accurate tab on machine loads at the Allison Division of Cadillac in Detroit has been facilitated by this new 7 x 20-foot board which lists each of the 750 machine tools (240 different types) in use in the plant. Directly opposite each machine posting, in columns headed by the designation of 13 departments, are the number of machines and the hours they run. At the end of the horizontal posting is the total load on machines of each type. Where a shortage of a certain type of "machine-hour" exists, the time figure is posted in red, indicating that to keep pace with schedules a specified time must be handled by other machines than those designed specifically for the job. The board also facilitates determination of the effects of changed specifications and rerouting of parts



WINCHESTER TRADE MARK REPEATING ARMS USES CLEVELAND MODEL 'B' IN THEIR *Tool Room!*



• Cartridge case draw punches for small arms ammunition are required in such quantities today that Model B Cleveland Automatics are used by Winchester Repeating Arms Company, Division of Western Cartridge Company at New Haven, Connecticut for their manufacture. Model B Clevelands are built from 1 1/16-inch to 2 1/2-inch capacities, and are used throughout industry for metal turning jobs which are simple but where high production is required. Ask for literature if you produce tap blanks, shafts with multiple diameters, nipples, studs and similar parts in quantity.

THE CLEVELAND AUTOMATIC MACHINE COMPANY
2269 ASHLAND ROAD, CLEVELAND, OHIO

Sales Offices at:

Newark, 15 Washington Street • *Detroit*, 2842 W. Grand Boulevard
Chicago, 565 W. Washington St. • *Cincinnati*, 507 American Bldg.

CLEVELAND *Single Spindle* AUTOMATICS

Mirrors of Motordom

(*Concluded from page 40*)

tion (which imposing name, by the way, is now the greeting of the operator when you call the Automobile Manufacturers Association), was held Saturday and about 1400 representatives from auto plants, parts producers, tool and die shops and others met with army and navy officials at Detroit's Masonic Temple. Alvan Macauley, chairman of the council and president of the A.M.A., presided. K. T. Keller of Chrysler, Paul G. Hoffman of Studebaker and O. E. Hunt of General Motors discussed production and technical services to be rendered by the council.

Following a general session in the morning, a series of smaller meetings followed, at which engineers and production experts from the various plants formulated plans for speeding output of all types of war material. Further details were revealed on the council's plan for listing idle production equipment which it will make available to any company in any industry having need for such equipment in war production. The list will include special-purpose machines and heat treating equipment, as well as standard machine tools.

♦

Formation of an eastern aircraft division of General Motors for the purpose of beginning manufacture of fighting planes for the Navy was announced last week. Included in the new division are Fisher Body plants in Tarrytown, N. Y., and Baltimore; Delco-Remy in Bloomfield, N. J.; Ternstedt in Trenton, N. J., and the Linden assembly division in Linden, N. J.

L. C. Goad, formerly general manager of AC Spark Plug at Flint, will head the new division.

♦

Packard has received new order for marine engines for use in naval torpedo boats which will result in doubling present production by August. New machinery will be required and some present automotive floor space will be turned over to manufacture of the 1350-horsepower engines. Present marine engine plant will be devoted to assembly and testing. Under terms of the new contract Packard extends its service to supply engines to the navies of the United States, British and Soviet.

Quotas Established for Truck, Auto Replacement Parts

Quotas for the manufacture of replacement parts for medium and heavy trucks, truck trailers, passenger carriers and school buses for the first quarter of this year have been established at 60 per cent of the amount sold by manufacturers during the last half of 1941, under Order L-35. A rating of A-3 has been assigned for materials entering into such parts, by P-107.

Automobile manufacturers were granted permission to make up to 150 per cent of replacement parts for passenger cars and light trucks as were manufactured during the 1941 calendar year. The output is planned as a stockpile to last an indefinite period after new automobile production facilities are converted to defense. An A-10 rating was granted for these parts and it was ruled their manufacture may continue during the first half of 1942 as long as skilled labor and machine tools are still available.

Associated Committees Ask for Ideas To Solve Mechanical Problems in War

■ ASSOCIATED Defense Committees of Chicago Technical Societies has been formed to enlist "the best brains of technical society members and industrialists in solution of many problems arising in the war effort." Twelve societies, including Chicago chapters, are co-operating. The organization is working with National Defense Inventors' Council Committee, which has assembled a large number of practical problems for which ideas are sought.

Not only are men needed for production of war material, but also their invention ingenuities. Each of the co-operating societies has selected from the problems those for which its industry would be fitted to make suggestions for solutions. These are being submitted to the full membership of the industry. The replies are presented to the National Defense Advisory Committee in Washington. A number of problems are reported to have been solved in this way.

The associated committees urge that any idea, no matter how far-fetched it may seem, be submitted as it may contain a clue leading to solution of a problem. While many improvements are made through sustained research, almost an equal number result from some idea or suggestion that has escaped researchers.

The technical societies co-operating with committees include: Acoustical Society of America; American Chemical Society; American Foundrymen's Association; American Institute of Electrical Engineers; American Society for Metals; American Society of Mechanical Engineers; Chicago Medical Society; Chicago Society for Measurement and Control; Illinois Professional Communications Association; Institute of Radio Engineers; Physics Club of Chicago; Western Society of Engineers.

Acting on instructions from Thomas J. Watson, president, International Business Machines Corp., New York, senior engineers, inventors and scientists at the company's research and engineering laboratories have turned over all of their usual duties to assistants, and are concentrating efforts on development of munitions, guns and implements of war.

Mr. Watson also instructed them to use any subordinates showing special talent. Many of the members of the IBM staff of experienced senior engineers, inventors and scientists have developed war implements or accessories of considerable promise. Some 350 persons are engaged in the corporation's laboratories.

Watch for Saboteurs, Fairless Warns

■ Benjamin F. Fairless, president, United States Steel Corp., in a statement addressed to all employes of the corporation and subsidiaries, published in the January issue of *US Steel News*, called upon them to keep a watchful eye for sabotage and fifth-column activity.

While this is a patriotic duty, Mr. Fairless pointed out that it should be exercised with good judgment and without resort to unwarranted suspicion or unjustified accusations.

"The overwhelming loyalty of the American people is self-evident," Mr. Fairless declared. "Our big job will be production. What we do and how we do it will have far-reaching effects on the battle line. We share a common danger. Our country, our homes, our families, our freedom—all that we hold dear—are at stake. We must and will fight through to victory."

■ Seamless Steel Tube Institute, Gulf building, Pittsburgh, has established a new service to furnish information on availability of various types and sizes of seamless steel tubing for new or special wartime requirements.

The new service follows numerous requests for such information, resulting from wide distribution of war work.

Steel Warehousemen Appeal to OPA; Report Price-Ceiling "Injustices"

■ AMERICAN Steel Warehouse Association Inc., Cleveland, last week appealed to Price Administrator Leon Henderson for relief from "hardships and inequities" resulting from price schedule No. 49, applying to warehouse sales, which went into effect Dec. 15.

The board of directors' executive committee sent Mr. Henderson a long statement of difficulties encountered by the industry in attempting to conform to the order. The association states it has 400 members, whose function is to supply steel from stocks to more than 200,000 large and small consumers in carload and less than carload lots. "More than 70 per cent of sales are currently for war purposes. Dislocations resulting from application of the order hamper supply of steel now urgently needed for war." Further:

"Without attempting to catalog all of the provisions which urgently call for revision, this schedule works hardship and inequity in that:

"1. *The order operates not only to fix a price ceiling, but in practical effect it introduces widespread changes and confusion in the economics of steel distribution.*"

The claim is made that the order in its practical operation goes far beyond the stated purpose of keeping prices within reasonable limits and would bring about damaging changes in steel distribution, in effect barring warehouses from the carload market by a provision that sales over 40,000 pounds be made at the mill price; that it restricts warehouses to certain trade areas and by a price wall bars them from other markets; that its "mixed carloads" provision is ambiguous.

Reduces Prices in Many Areas

"2. *The order, while its declared intent is to fix prices as of April* 16, 1941, *in fact reduces prices in many areas far below that level, and in certain cases puts them below cost without allowance even for the cost of handling.*"

In practical operation, the association says, the result of the order has been to reduce prices on certain classes of business and in certain areas as much as $7 per ton below the prices of April 16, 1941, and therefore, at some points, is confiscatory.

"3. *The order results in needless delay in fulfillment of calls for car lots of steel, virtually all of which are urgently needed for war industries.*"

The requirement for obtaining from OPM certification for shipment of certain car lots from warehouse stocks, it is claimed, will result in delays to the war effort. OPM already has full control over distribution from warehouses and it would appear the expedient way of controlling release of such car lots would be by priority ratings.

"Staggering Burdens"

"4. *The order imposes staggering burdens upon the industry with respect to keeping and forwarding records to Washington.*"

This complaint arises from uncertainty in interpretation of regulations as to records to be filed with OPA on any sales of 40,000 pounds or more of any iron or steel products to any single customer in any calendar month, to be filed before the 15th day of the succeeding month.

Attention is called to the fact that many warehouses serve 5000 customers or more through a single plant, that inventories include practically every steel product, in numerous instances 10,000 or more items, and the task of keeping requisite records is claimed to be immense.

"5. *The order creates many other ambiguities and injustices which call for correction.*"

Inadequate provision is made to compensate Pacific Coast distributors for increased freight costs arising from restrictions on water shipments, the association claims; distributors are required to absorb freight rate advances which have become effective since April 16 in other parts of the country; in certain territories and on certain products unnaturally low prices resulting from temporary market disturbances, subsequently alleviated, have been frozen as ceiling; special handling charges necessarily incident to certain products have not been recognized by the schedule.

The complaint adds that schedule No. 49 cannot operate as declared in the order itself: "To protect both the consumer and the jobbers, dealers and other distributors who have maintained a reasonable price level." The committee asked for a conference with the price administrator.

Idea Helps Speed War Production

■ Employes contribute their inventiveness to speeding up and improving airplane production. Here W. S. Haughton of the Lockheed metal fittings department, explains to his foreman, G. H. Wales, a new type of welding torch, with an air-cooled tip which he calls an "aerobutor", and which is claimed to have 50 per cent greater life by virtue of finned duralumin construction

■ To aid in conserving steel Standard Oil Co. of Indiana last week appealed to customers who receive lubricating oils and greases in steel barrels to return them as soon as they are empty.

Navy To Spend $20,000,000 at Lukens

Steel for Additional Plate Capacity

■ UNITED STATES Navy will spend nearly $20,000,000 for additional facilities and plants at Lukens Steel Co., Coatesville, Pa., and its subsidiary, By-Products Steel Corp., also at Coatesville, it was announced last week by Robert W. Wolcott, Lukens president.

At By-Products Steel, a new flame-cutting plant, 90 x 350 feet, costing approximately $800,000, will be constructed by the Navy, which will be rented to and operated by this Lukens subsidiary.

At Lukens Steel, the Navy will spend $18,909,600. Additional facilities for handling and shipping rolled armor plate will be constructed. A new 120-inch finishing mill will be installed behind the present Lukens 112-inch mill. Additional facilities will be installed in the Lukens No. 3 open hearth steelmaking plant. In addition, an armor plate heat-treating plant will be built. Mr. Wolcott said Arthur G. McKee & Co., constructors, will handle all engineering and construction work.

Urges Use of Strip Mills for Plates

■ IMMEDIATE conversion of strip mill facilities to produce at least 3,000,000 tons of plates annually and later adaptations to double this figure were urged last week by Joseph Malborn, engineer, United Engineering & Foundry Co., Pittsburgh.

Speaking before the Cleveland district section of the Association of Iron and Steel Engineers, Cleveland Engineering Society, Jan. 19, Mr. Malborn contended early action along these lines "is essential if the steel industry is to supply the plates needed for the victory program. . . .

"With this country and its allies facing one of the gravest perils in history, it becomes our duty to provide the materials necessary to defeat the Axis powers."

Plate and sheets are the most important commodities produced by the steel industry today, he pointed out, and there is no country in the world which can supply them in greater quantities and with greater speed than the United States.

Digressing briefly, he emphasized there is a tremendous demand for duralumin as well as aluminum sheets for the aircraft industries. "We cannot build mills to roll this product, for the time is too short," he remarked. A similar situation faced England when it entered the war, but rather than wait to lay down new mills for rolling duralumin the British reconditioned old tin mills in Wales which long had been idle.

Three weeks afterwards six mills were engaged in the production of this type of sheets. The old pack furnaces were used until more modern furnaces could be built. Today four plants in South Wales are engaged in the production of duralumin sheets. "This is brought to your attention merely to show that some of the things we are considering today impossible are far from being in such a state."

"If platemakers in this country were asked to schedule their mills on such specifications as the foreign producers are obliged to do, they would turn their heads the other way. . . . Before this war is over, we in this country may be obliged to do things which formerly were considered impossible."

Late last year the quantity of plates needed in this country was said to be about 8,500,000 tons. Later the estimate was increased to 10,000,000 tons. Today this is not enough.

"No one today can tell us how much steel plate tonnage will be needed this year, although it appears likely that it will be 12,000,000 tons," he said.

This country now has capacity for only 6,000,000 tons of plates annually, Mr. Malborn stated. "We have that capacity all right," he said, "but the way orders are being served out, the 6,000,000 figure is maximum.

"Not long ago I saw a 100-inch plate mill rolling material 48 inches wide, ⅜-inch thick. We have strip mills in this country to roll material in this width and gage, and until we get tonnage to fit 100-inch plate mills we are never going to attain the output necessary to meet present war-time needs."

He urged that this country take steps immediately to get 3,000,000 tons of plates from present strip mill installations, adding "and this figure will have to be increased to 6,000,000 tons."

Of the 28 wide continuous strip mills, 25 are available to produce a total of 15,500,000 tons of strip, 30 to 92 inches wide. These mills are capable of rolling 2,600,000 tons of strip 30 to 37 inches wide; 5,000,000 tons of strip 38 to 60 inches wide; 4,800,000 tons of strip 70 to 74 inches wide; and 3,100,000 tons of strip 84 to 92 inches wide, or a total of 15,500,000 tons of available capacity.

Many of the mills are not adapted to rolling plates, "though by installing longer cooling beds and heavier shearing and leveling equipment we should be able to get at least 3,000,000 tons of 3/16-inch to ¾-inch plates."

The speaker said that the smaller mills must be studied for the possibility of getting plate tonnage from them immediately, as for them there is no time to install the longer cooling beds and heavier shearing equipment.

New construction, he said, will bring in approximately 2,000,000 tons of plate capacity but only half of this will be ready this year.

Mr. Malborn contended that it would be better to put equipment in mills that could produce plates "to win the first battle", rather than to wait for an alteration of mills "to win the last battle."

Scrapped on the Lakes, Second Step Is on the Seas

■ A conversion cycle of steel in the form of ship plates—from a famous Great Lakes passenger vessel, to scrap, back to plates, thence to California shipyards and fabrication into merchant vessels for service on the high seas—was described last week by E. J. Kulas, president, Otis Steel Co., Cleveland.

The side-wheeler CITY OF ERIE, 324 feet long, 2233 tons displacement, was built at a cost of $375,000 in 1897 at Detroit Dry Dock Co.'s yards, Wyandotte, Mich. It was one of the fastest passenger vessels on the Great Lakes. Its historic race with the steamer TASHMOO of Detroit, between Cleveland and Erie, Pa., 94 miles, in 1901, was won in four hours, 19 minutes, or 45 seconds ahead of the TASHMOO.

After more than 40 years' service, the CITY OF ERIE, like many Great Lakes passenger boats, gave way to improved railroad transportation, automobiles and airplanes. Retired, it was purchased by Otis last fall for scrap. New plates made with the scrap are being used in building Pacific carriers.

"It is possible," said Mr. Kulas, "that the CITY OF ERIE's plates were originally rolled at Otis' Lakeside works, as the company in those days rolled plates for many ships, and operated the only mill in this district which produced plates of this type."

36,000 New Freight Cars Assured by May 1; Plan for 926 Locomotives

■ COMPLETION and delivery of 36,000 new freight cars by May 1, under the program approved early this month by Supply Priorities and Allocations Board, was pledged to the Office of Production Management last week by the railroad industry's advisory committee. At the same time 926 locomotives of various types will be built.

This car and locomotive program is estimated to require 1,413,893 tons of steel, 353,637 tons of iron castings, 19,985 tons of nonferrous metals and 570 tons of rubber.

The advisory committee asked OPM to reconsider the need for new coaches and sleeping cars. Production of all passenger equipment has been scheduled for elimination when current orders are filled. The committee pointed out that military traffic will increase and civilian passenger traffic will be heavier, due to curtailed use of automobiles. OPM was asked to make available immediately material for repair of existing equipment and to authorize construction of new passenger cars.

War agency officials have been reluctant to add to heavy material requirements by construction of passenger equipment and have been working out a program to convert Pullman cars into troop sleepers and parlor cars into passenger cars with increased seating facilities.

The committee also has asked OPM to resurvey requirements of the railroad industry for steel castings to determine more definitely whether the supply of castings will be large enough for the projected building program and also repair parts. The Army has experimented with manufacture of tanks from castings instead of armor plate and indications are that the tank program will require a large number of castings, thus causing a shortage for other uses. To meet this condition car builders and OPM have been experimenting with increased use of welding to reduce need for castings in freight cars.

632 More Liberty Ships Ordered by Maritime Commission

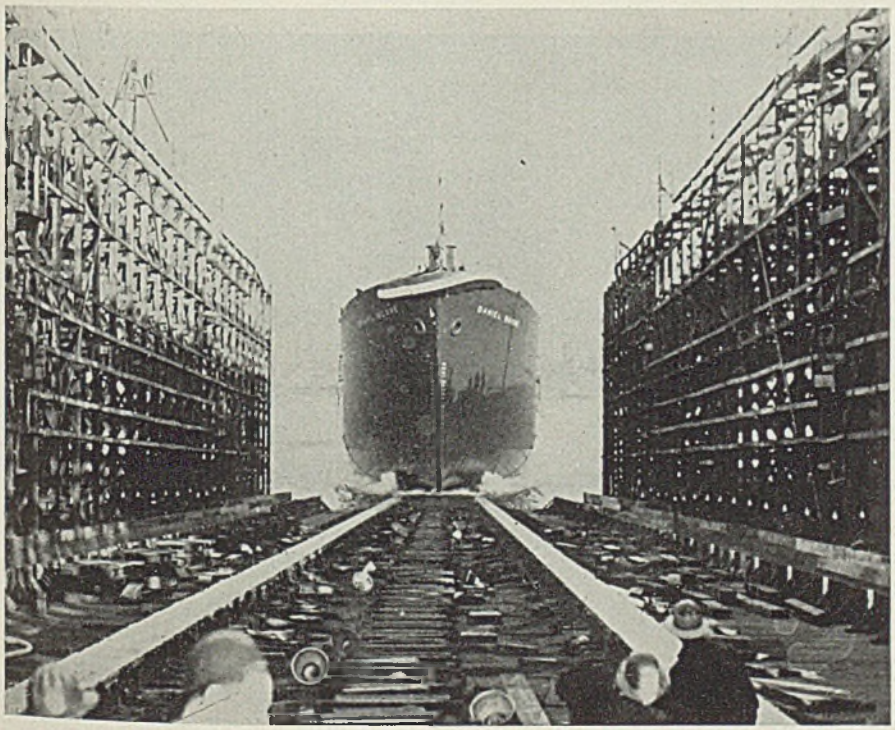
■ United States Maritime Commission last week negotiated contracts for the construction of 632 additional merchant vessels to bring its program up to President Roosevelt's request for 8,000,000 deadweight tons of shipping this year and 10,000 000 deadweight tons in 1943.

Capt. Howard L. Vickery, member of the commission, estimated the new ships—all of the emergency type known as "Liberty ships"—would cost $1,110,000,000. All will be completed by the end of 1943.

"This will mean," he said, "American shipyards will turn out over 1900 vessels in the next two years, the greatest shipbuilding effort in history. The ships newly contracted for represent more than 5,000,000 deadweight tons and will give the United States a total of 18,500,000 tons of new maritime construction."

Captain Vickery said the reason the commission is able to carry out the President's expanded shipbuilding program is largely because the design of the Liberty ships has been standardized and their building becomes a manufacturing problem. He estimated the program will require about one-third more workers than are presently employed.

Slogan for the new construction program will be "105 days from keel laying to delivery."



■ Liberty freighter, DANIEL BOONE, sliding down the ways last week at Long Beach, Calif., shipyards. This was sixth of a series to be launched at the yards

Propose 48-Hour Week To Speed Shipbuilding Program

Plans for shipbuilding on a six-day 48-hour week for workers, patterned after a tentative wartime agreement reached on the Pacific coast, will be proposed for shipyard operations in the Atlantic, Gulf and Great Lakes zones, according to Sidney Hillman, WPB Labor Division.

Under the Pacific coast agreement worked out by the representatives of the government, labor and management, now awaiting final ratification by the unions and governmental agencies, shipyards will be in production seven days a week, 24 hours a day, with staggered shifts making possible one day of rest weekly for each worker. Time and one-half overtime will be paid for all work above 40 hours weekly.

"With adoption of similar agreements in the other three zones of the nation, shipyard owners and workers will have gone a long way toward securing the 18,000,000 tons of new shipping scheduled for the next two years," Hillman said.

He declared further that representatives from his office reported that "On the West roast, the President's request for continuous operations of yards was met by enthusiastic response from nearly 100 conferees who, in two days of discussion, fashioned an agreement covering 55,000 employes."

Through extension of staggered shifts and the six-day, 48-hour week to all American shipbuilding facilities, all-out, around-the-clock production will be achieved.

Dominion Extends Algoma Steel Corp. Expansion; $17,000,000 in Project

TORONTO, ONT.

■ ALGOMA Steel Corp. Ltd. is proceeding with a plant expansion program at Sault Ste. Marie, Ont., which, when completed in 1943, will represent expenditure of $17,000,000, according to C. D. Howe, Minister of Munitions and Supply.

The expansion program is being financed by the Canadian government, and was started last year, when the financial outlay was reported as $4,000,000. However, due to depletion of scrap resources in this country, and to provide raw materials for steel production, the government has decided to greatly extend its original project at the Algoma works. When completed the company's steel production will be increased by 500,000 tons per year. In addition to extending rolling mill facilities, a new blast furnace will be installed and the old blast furnac will be rehabilitated, which will result in an increase of 1000 tons in production of basic iron and provide for additional 300 tons of foundry or malleable iron daily. More coke ovens also will be constructed.

Used 4,000,000 Tons of Steel

At the present rate of production, war materials output in Canada will require about 4,000,000 tons of steel this year, including alloy and armor plate. At least 1,750,000 tons will have to be imported from the United States. According to Ottawa officials, Canada's output of war materials will be stepped up from time to time and in this case imports of steel from the United States will have to be raised considerably.

J. H. Berry, director-general of automotive production in the Department of Munitions and Supply, announced that an order has been placed with Chrysler Corp. of Canada Ltd., Windsor, for 3000 trucks for the Army and Air Force, to be delivered early this year.

Hollinger Consolidated Gold Mines Ltd. will construct a $50,000 mill at its mine at Timmins, Ont., for recovery of tungsten from the Hollinger scheelite, E. L. Longmore, superintendent, announced. He stated that the new mill is distinctly a war measure. Mr. Hollinger has made three shipments of the raw ore to Ottawa where a mill was constructed for experimental purposes, and recently has been producing small quantities of tungsten concentrates for Canadian tool steel plants.

Mr. Longmore stated: "We are by no means certain the production of tungsten will be profitable for us. However, the government needs it for war industry and we are hopeful that the scheelite can be found in sufficient quantity to make the venture a success." He stated that scheelite deposits discovered to date in the Hollinger mine were very erratic, but the new mill will be available to other mining companies in the Porcupine area.

Hollinger Consolidated Gold Mines is the largest producer of gold in Canada, and tungsten will be a by-product of the primary enterprise.

Department of Munitions and Supply for the week ended Jan. 6, placed 2960 contracts of total value $11,998,151. The list included orders to United States firms valued at $57,926, while the most important award went to Ford Motor Co. of Canada Ltd., for ordnance at upwards of $8,000,000. Orders include:

Land Transport: General Motors Products of Canada Ltd., Oshawa, Ont., $98,492; Dunlop Tire & Rubber Goods Co. Ltd., Toronto, $37,185; Gutta Percha & Rubber Ltd., Toronto, $32,350; Firestone Tire & Rubber Co. of Canada Ltd., Kitchener, $24,440; Chrysler Corp. of Canada Ltd., Windsor, $8003; National Steel Products Ltd., Montreal, $19,800.

Aircraft: Overseas Requisition, London, England, $86,940; Fairchild Aircraft Ltd., Longueuil, Que., $35,277; Aviation Electric Ltd., Montreal, $14,535; Noorduyn Aviation Ltd., Montreal, $8118; Laurentian Metal Products, Aylmer, Que., $8653; Campbell Steel & Iron Works Ltd., Ottawa, $5274; Ottawa Car & Aircraft Ltd., Ottawa, $16,043; Peterborough Canoe Co. Ltd., Peterborough, $14,428; National Steel Car Corp. Ltd., Malton, Ont., $11,212; DeHavilland Aircraft of Canada Ltd., Toronto, $147,726; Progress Engineering Co., Toronto, $57,600; Weaver Industries Ltd., Chatham, $31,820.

Instruments: Overseas Requisition, London, England, $30,800; Therapeutic Electric Products, Levis, Que., $5908.

Electrical Equipment: Northern Tool & Gauge Ltd., Eastview, Ont., $43,965; R. C. A. Victor Co. Ltd., Ottawa, $84,804; Canadian Telephones & Supplies Ltd., Toronto, $10,343; Sparton of Canada Ltd., London, $23,413; Canadian General Electric Co. Ltd., Vancouver, B. C., $7127.

Machinery: Herbert Morris Crane & Hoist Co. Ltd., Niagara Falls, $7105.

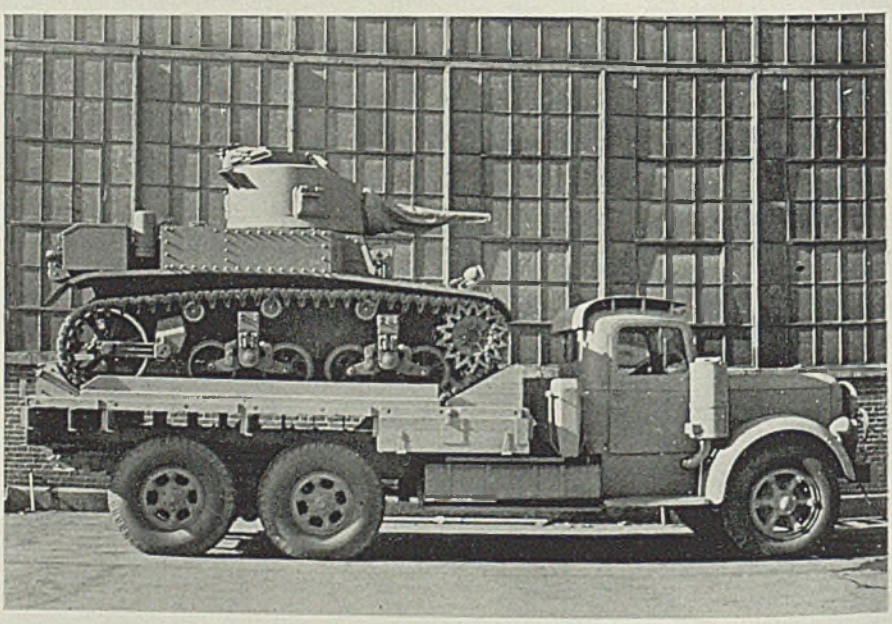
Ordnance: Overseas Requisition, London, England, $5500; Hall Machinery Co., Sherbrooke, Que., $57,195; Delamere & Williams Ltd., Toronto, $24,732; Ford Motor Co. of Canada Ltd., Windsor, $8,026,263.

Munitions: A. Deslauriers & Fils Ltd., Quebec, $7970; Viceroy Mfg. Co. Ltd., Toronto, $5539; T. W. Hand Fireworks Co. Ltd., Cooksville, Ont., $118,800.

Miscellaneous: Steel Co. of Canada Ltd., Montreal, $13,978; Dominion Rubber Co. Ltd., Ottawa, $15,722; Dominion Brush Mfg. Co., Granby, Que., $7000; George W. Prowse Range Co. Ltd., Ottawa, $8529; Canada Cement Co. Ltd., Winnipeg, Man., $65,561.

■ Tyson Roller Bearing Corp., Massillon, O., manufacturer of tapered roller bearings, has broken ground for an addition to cost a third of a million dollars. New plant will be completed by April 1. Company already has doubled plant facilities in the past two years.

Trucks Give Fighting Tanks a Lift



■ Fast motor transportation of fighting tanks to the scene of combat has been a feature of the successful British offensive in Libya. Large numbers of American-built, diesel-powered trucks of the type illustrated have been used effectively by the British forces for this purpose. Trucks are equipped with a special skid structure whereby the tanks can be run on and off the trucks in a matter of minutes. Photo, Mack Trucks Inc.

Nazis "Surprisingly Well Supplied" With Minerals Essential for War

■ GERMANY "is surprisingly well supplied with minerals for essential military needs" as result of an 8-year mobilization of resources through purchase and aggression, according to a report by the Bureau of Mines.

The survey, prepared by Charles Will Wright, foreign minerals specialist, points out that the Nazis have stockpiled scarce minerals since 1933.

While the report deals with the mobilization of natural resources of Germany and its victims rather than that of the democracies, it emphasizes the tasks confronting the United States.

In the case of aluminum and magnesium, metals essential to the manufacture of airplanes and incendiary bombs, Germany was outproducing the United States, Great Britain and Canada up to 1941. By the end of 1941, it was expected that the combined aluminum output of the three allied countries would pull ahead of German-dominated nations, and that the Allies' 1941 figures would be nearly doubled by the end of 1942. In the case of magnesium, it is believed that American and British output is now equal to German production, while American output alone by 1943 will be more than four times Germany's expanded 1941 production.

Germany is assured ample supplies of lead, zinc, and mercury for all essential needs, and now controls enormous resources of iron ore, manganese, and coal capable of supporting an iron and steel industry that can compete with that of Great Britain and the United States.

Blast furnaces now within the German sphere of domination produced 44 per cent of the world's pig iron in 1940, and the Axis is diverting a larger proportion of its steel to military needs than are the democracies.

Germany also has available large reserves of regimented labor, and if she is successful in controlling the areas now occupied and in reorganizing industry and transportation to meet military requirements, she should be able to wage war effectively for some time.

Germany lacks copper, tin, tungsten, nickel and petroleum but these deficiencies have been made up in part by substitution, reclamation, stockpiling, and increased production mostly from submarginal deposits. There is no immediate prospect of a collapse of the military machine because of shortages of any of these minerals.

German possession of the Near Eastern oil fields, would assure ample petroleum for all essential needs if transport and reconstruction problems were solved.

Estimated 1942 Production in German Controlled And Supplying Countries

(In Metric Tons)

Country	Coal 1000 T.	Iron Ore 1000 T.	Pig Iron 1000 T.	Manganese Ore 1000 T.	Chromite	Tungsten 60% WO_3	Nickel	Copper
Germany-Austria	450,000	15,000	22,000	...	.....	...	600	36,000
Poland	40,000	900	1,000	...	.....	...	.....	.....
Belgium-Lux.	30,000	6,000	5,000	...	.....	...	.....	.....
France	51,000	35,000	8,000	...	.....	...	.....	.....
Netherlands	13,000	.....	300	...	.....	...	.....	1,000
Norway	.....	1,500	175	...	.....	20	1,250	20,000
Sweden	450	14,000	700	6	.....	200	.....	10,000
Finland & Est.	...	.....	30	...	.....	...	.....	12,000
Czechoslovakia	31,000	2,000	1,200	...	.....	...	.....	.....
Hungary	11,000	400	500	24	.....	...	.....	400
Rumania	2,600	130	140	40	.....	...	.....	600
Bulgaria	3,000	20	.....	1	4,500	...	.....	400
Yugoslavia	6,000	600	60	6	60,000	...	.....	65,000
Greece	120	300	.....	11	57,000	...	1,300	.....
Italy	3,000	1,000	1,000	60	.....	...	200	1,000
Switzerland	3	180	.....	...	.....	...	.....	.....
Tunisia	.....	800	.....	...	.....	...	.....	.....
Algeria	13	2,800	.....	...	.....	...	.....	.....
Morocco	100	1,600	.....	90	.....	16	.....	.....
Ukraine	.....	18,000	9,000	1,200	.....	...	.....	.....
Portugal*	.....	.....	.....	...	.....	2,500	.....	3,000
German Controlled† Countries — Total	641,286	100,230	49,105	1,438	121,500	2,736	3,350	149,400
World's Output	1,360,000‡	216,675	113,000	5,250	1,210,000	25,520	130,000	2,290,000
Per cent controlled by Germany	47	46	44	27.5	10	11	2.5	7

(In Metric Tons)

Country	Zinc	Lead	Antimony	Bauxite 1000 T.	Aluminum	Magnesium	Mercury	Molybdenum ore	Petroleum and Substitutes in 1000 bbls.
Germany-Austria	220,000	190,000	180	20	240,000	25,000	65	...	26,263
Poland	150,000	22,000	...	...	.....	.....	...	...	3,891
Belgium-Lux.	20,000	90,000	...	...	.....	.....	...	...	.....
France	10,000	42,000	...	700	50,000	2,000	...	...	496
Netherlands	.....	.....	...	...	.....	.....	...	...	.....
Norway	5,000	320	...	...	15,000	.....	...	600	.....
Sweden	32,000	.....	...	...	1,400	.....	...	...	...
Finland & Est.	1,000	...	...	...	.....	.....	...	...	1,000
Czechoslovakia	3,000	4,500	900	1	.....	.....	100	...	119
Hungary	1,000	200	...	700	2,800	.....	...	...	1,755
Rumania	.....	5,200	...	40	.....	.....	...	160	43,231
Bulgaria	.....	.....	...	...	.....	.....	...	...	.....
Yugoslavia	30,000	10,000	3,350	150	2,800	.....	...	60	9
Greece	3,000	5,000	10	50	...	...	...	300	.....
Italy	100,000	40,000	800	530	40,000	500	2,320	40	1,716
Switzerland	.....	.....	...	...	28,000	700	...	...	.....
Tunisia	6,000	24,000	...	...	.....	.....	10	...	.....
Algeria	15,000	.....	800	...	.....	.....	6	...	2
Morocco	1,000	.....	200	...	.....	.....	...	280	25
Ukraine	.....	.....	...	...	.....	.....	...	...	.....
Portugal*	.....	.....	130	...	.....	.....	...	...	.....
German Controlled† Countries—Total	597,000	433,220	6,370	2,191	380,000	28,200	2,507	1,440	78,507
World's Output	1,800,000	1,750,000	34,000	4,400	800,000	42,500	6,000	21,220	2,259,378
Per cent controlled by Germany	33	25	19	50	47.5	66	42	7	3.4

*The portion of production that probably went to Germany. †To these estimates should be added part of the mineral production of Spain including iron ore, copper, lead, zinc and mercury and of Turkey, including chromite, copper, zinc and antimony. ‡1939 production estimate. Only slight change expected in total 1940 coal output.

Trenton Shops Form Pool for War Contracts

■ A pool is being formed by 35 industrial establishments in the Trenton, N. J., area to engage in war work. Sloane-Babon Corp., Trenton, is in charge of co-ordinating facilities and will aid in engineering, figuring costs and negotiating contracts. This is one of several such organizations being formed in New Jersey and will be known as the Central New Jersey pool.

Government officials and the Trenton Chamber of Commerce have made a survey which revealed that 326 machine tools important to the war effort have not been used. War orders, prime or subcontracts, are being solicited in the medium heavy machine tool field. Formation of such pools in New Jersey is under guidance of Lewis Fenn Vogt, industrial consultant, head of the pooling section, Division of Contract Distribution, Newark.

Four-Point Program To Increase Vital War Supplies Outlined by OEM

WASHINGTON

■ THE CLEAR superiority of the United States in raw materials in the vast struggle now in progress is encouraging, states OEM in a review of the situation at the beginning of 1942. The nation's job, it points out, is to see how rapidly the country can translate her products of mine, farm and factory into the finished instruments of war, emphasizing the fact we are geared to a high degree of civilian production is a handicap in many ways.

Lack of rubber for automobile tires and tin for canned foods, it is pointed out, are far more serious problems for the United States than they are for Japan or Germany. On the other hand, restricted use of these luxuries opens up a vast storehouse of materials no other nation possesses.

The United States produces nearly half the world's supply of raw materials and regularly consumes as much as the rest of the world combined.

We produce a third of the world's iron ore, more than 40 per cent of its iron and steel, 25 per cent of its coal and two-thirds of its oil. From our mines come 37 per cent of the copper, 29 per cent of the zinc and 24 per cent of the lead in the world.

The other nations of the Western Hemisphere provide us with additional stores of these basic materials and with others that we lack. Canada produces 85 per cent of the world's nickel, as well as many other vital metals. Chile sends us large quantities of copper. Brazil supplies all our quartz crystals. Argentina is a tremendous source of hides. Bolivia is sending us tin ore. Sixty per cent of our bauxite supply comes from Dutch Guiana. Mexico currently is supplying us with mercury.

On Debit Side

On the debit side, we are largely dependent, insofar as normal demand goes, upon other parts of the world for tin, rubber, hemp, chromite, tungsten, mica splittings, graphite, burlap, jute, palm and cocoanut oils, manganese, cork, asbestos, cadmium and a score of lesser known materials that we can do without if we have to.

Immense as our stores are of the vital materials for war, they are not enough for our present purposes. Thus the United States now is engaged in a fourfold attack to increase its supplies of all vital materials that supply the war production machine. These steps are:

1. Increasing our domestic production by government subsidy and by private capital; by urging adoption of the 160-hour work week in key industries.

2. Increasing our imports from all parts of the world where imports are possible and encouraging increased production in all areas to which we have shipping access.

3. Limiting civilian use of critical materials.

4. Encouraging substitution and conservation in this country.

The government, through the RFC, has advanced billions of dollars to industry for the construction of new plants, additions to existing ones, opening of new mines, mining of low-grade ores, and the like, for increasing domestic production.

Doubling Aluminum Output

The most important material for war, next to steel, is aluminum. Our 1939 primary production of 328 million pounds was adequate for all civilian purposes, but it did not begin to fill the bill when we started to produce warplanes in quantity. So we stepped it up, in 1941, to about 600 million. Now we are faced with a heavy bomber program, which uses 30,000 pounds of aluminum per ship as compared to 5000 for a fighter. So in numerous localities today new aluminum plants are going up, aimed at doubling our aluminum output in 1942.

Magnesium is aluminum's twin in airplane production. In 1938 total consumption was less than 3 million pounds. Primary production in 1941 was about 33 million pounds and next year we expect to produce five times as much.

These three, steel, aluminum and magnesium, are materials which we have or have access to plentiful supplies of ores and our principal problem is increasing manufacturing facilities. In most of the other vital materials the problem is one of seeking new sources and developing to the limit present sources.

This is true of copper. Domestic production in 1941 set a record of more than a million tons. Imports, largely from Chile, were scheduled at about half a million. Despite the fact that never before have we had so much copper in this country, it is not enough. We have no known large deposits of high-grade copper not now being worked. Yet we expect to have in 1942, 1,800,000 tons or more. This can be accomplished by working available sources to the limit; increasing the work week in the copper mining industry to 160 hours where possible; increasing imports from Chile by approximately 150,000 tons, and by paying a bonus price for high cost copper production from low-grade ores.

Second only in importance to these basic metals are the many alloying metals. Most important of these are nickel, chromium, tungsten, manganese, vanadium, cobalt, molybdenum and silicon. Supplies of most of them are limited. In 1941 we consumed two-thirds of the world supply of nickel, and could have used more. Only molybdenum and silicon are found in plentiful quantities in this country and we largely are dependent upon imports for all the rest.

We have been dependent upon the Orient and the East Indies for large quantities of chromium, tungsten and manganese, quantities which probably will be lacking for some time to come as a result of Japanese aggression in the Pacific.

This country has low-grade deposits of these ores, which now are being worked under various forms of government subsidy. South American production has been sharply stimulated. Arrangements have been made for increased imports from the parts of the world, notably Africa, to which we have shipping access. In addition, stockpiles have been built up in this country over a period of years which will help carry us through.

More Alloy Steel Made

This country produced in 1940, approximately 5 million tons of alloy steel, a little over 8 million in 1941 and may go as high as 12 million in 1942. If we are to produce all the special steels of one kind or another the war program requires, care and study of specifications necessary.

The other best known materials we get from abroad are cork, tin, rubber and hemp. Cork comes from Spain and Portugal, tin, rubber and hemp from the Far East.

We use about 100,000 tons of tin a year, 75 per cent for "tin cans." All of it, practically, comes from Malaya and the Netherlands Indies. The strictest kind of conservation of tin is necessary.

Rubber, 72 per cent of which is used for tires, is a parallel case. There is no other source in the world for the 600,000 tons of rubber we need annually. The strictest kind of tire conservation is necessary.

In lead and zinc we have sufficient domestic production for war and essential civilian uses. Conservation will be necessary, but we do not face any lack of supply for military purposes.

AFL-CIO Merger Favored by Members, Leaders, but Faces Difficulties

■ JOHN L. LEWIS' unusual flair for the dramatic scored a major hit last week when he proposed an "accouplement" between the Congress of Industrial Organizations and the American Federation of Labor.

The surprise proposal was timed to coincide with publication of a Gallup poll showing 87 per cent of the leaders of both unions and 71 per cent of the membership favored such a merger.

It was made on Lewis' initiative (as a member of the dormant CIO "peace" committee), apparently without prior conference with high officials of his own union—particularly CIO President Philip Murray.

It followed several co-operative moves by the two major unions, such as the demonstration of solidarity in the labor leaders' conference with industrial management representatives last December which resulted in the no-strike, no-lockout pledge and the creation of the National War Labor Board. A more recent demonstration has been the co-operative action of CIO and AFL unions (with other labor groups) in San Francisco in buying newspaper space to jointly pledge no interunion disputes, peaceful settlement of all disputes and increased production for the duration of the war.

It came at a time of comparative freedom from jurisdictional disputes and at a time when the nation is united in the determination there shall be no stoppage of war material production by strikes.

Success In Doubt

Chances for success of the merger proposal only can be conjectured at present (Jan. 22). AFL President William Green has indicated his willingness to resume peace talks. CIO President Murray appeared piqued because the suggestion came from Lewis, suggested it should have come from the office of the CIO president. However, he agreed to submit it to the CIO executive board.

Even should the union conferees again take up the peace pipe, many barriers to a happy reunion will remain. Chief among these is the question of representation to be accorded the various subunions, and who will obtain the high offices in the united organization.

When the last peace conference broke down on April 5, 1939, the two groups were divided on the former issue. Green had proposed the CIO submit its membership list to audit as a preliminary to the peace negotiations, and asked acceptance of the AFL definition of membership—dues-paying membership. To this the CIO would not consent. Lewis claimed 5,000,000 members for the CIO. He admitted all were not paying regular dues, but had merely signed cards giving CIO the privilege of bargaining for them.

Last year the AFL had a dues-paying membership of slightly more than 4,500,000. Exemptions from dues payments accorded to workers who were ill or for other reasons were estimated to have brought total membership to about 5,000,000.

The CIO still does not make public the number paying dues but claims a membership of 5,000,000. Of these, 600,000 belong to United Mine Workers of America, 500,000 to the Steel Workers Organizing

National War Labor Board Holds First Meeting

Seated, left to right:
George W. Taylor, University of Pennsylvania economics department, vice chairman of the board.
Chairman William H. Davis, New York patent attorney.
Frank P. Graham, president, University of North Carolina.
Standing, left to right:
E. J. McMillan, president, Standard Knitting Mills Inc.
Mathew Woll, vice president, American Federation of Labor.
Walter C. Teagle, chairman, Standard Oil Co. of N. J.
A. W. Hawkes, president, Congoleum-Nairn Inc., and president, United States Chamber of Commerce.
Roger Lapham, president, American Hawaiian Steamship Co.
George Meany, secretary-treasurer, AFL.
Thomas Kennedy, secretary-treasurer, United Mine Workers of America-CIO.
R. J. Thomas, president, United Automobile Workers-CIO.
A twelfth member, Dean Wayne L. Morse, University of Oregon Law School, was not present at board's first meeting.

Committee, and 400,000 to the United Automobile Workers.

While these claims probably are somewhat exaggerated, there is no doubt that both unions have made large gains in membership since the beginning of the armament program, both as result of expanded employment and as result of gaining the closed or union shop in additional plants, thus forcing employes to sign.

Thus if the merger should be effected the united group probably would have a membership of nearly 10,000,000.

Substantiation of the gains made by the two unions is contained in last week's report by the House naval committee's ten-month investigation of the armament program. The committee found that the "tremendous financial gains" made by the unions during the defense effort "present an astounding picture of concentration of wealth, a situation hitherto usually associated only with industry and finance."

Committee found that the net assets of 117 unions investigated had increased from $71,915,665 to $82,-594,959, or 14.85 per cent, in the 18-month period between Oct. 1, 1939, and March 31, 1941.

Urge Government Audits

Urging government supervision of union finances, the committee said: "These vast tax exempt funds reposing in the treasuries of labor organizations, many of which by strikes and work stoppages have delayed and in instances even obstructed the defense program, present a problem which the committee feels should be well considered by Congress."

AFL national organization showed a percentage gain of 14.74 per cent in the 18-month period. CIO unions surveyed had a percentage increase of 69.93 and Lewis' United Mine Workers, wealthiest of the CIO unions, had a gain of 62.65 per cent.

Additional gains in war industry and all manufacturing employment have occurred since the committee's investigation was started.

Another obstacle to a happy remarriage of the CIO and AFL is that which caused Lewis to break away from the AFL in 1936 and set up the CIO. AFL leaders at that time refused to approve unionization on vertical lines and insisted on strict adherence to the traditional craft unionism.

The vertical union idea is to organize all workers in a plant or industry in one big union; the craft idea is to form separate unions for workers of differing skills—glaziers, bricklayers, carpenters, etc.—even though all are employed in one plant.

Still another difficulty that will pop up in any peace negotiations are certain long-standing feuds between leaders in the two unions. Best example is that between Lewis and Green, which reached its peak in the 1939 peace talks. They haven't been on speaking terms since and as late as December, they sat at the same conference table at the President's industry-labor meeting and ignored each other.

However, the changed conditions may work favorably toward the "accouplement". As Lewis said in his letters to Green and Murray: "The sequence of events since the last meeting . . . have enfeebled certain obstacles and factors of control which then existed."

Reunion of the two groups would tend to eliminate the major jurisdictional disputes, a leading cause for strikes during the past six years. Minor jurisdictional squabbles probably would continue if the craft unions were retained, such as those between the glaziers and bricklayers as to who should install glass block.

A united and numerically more powerful organization would be in a stronger position to demand closed shop or union shop.

Conceivably, it might also be in a better position to campaign for labor's newest aim, a voice in planning production and management, depending on the nature of the union's leadership and the restrictions or encouragements by the government.

Forty Million Now Under Old Age Insurance

At the end of 1941, the federal old-age insurance records showed the crediting of wages during the year to approximately 40,000,000 employes or some 5,000,000 more than the number who received taxable wages in 1940, Federal Security Administrator Paul V. McNutt announced. The taxable wages paid to these 40,000,000 workers amounted to about $41,000,000,000, nearly 25 per cent more than in 1940.

Summary of a survey by the Social Security Board's Bureau of Old-Age and Survivors Insurance, shows that the effect of the defense program on covered employment and taxable wages was already apparent during the latter part of 1940. An estimated total of 35,000,000 persons worked in covered jobs during some part or all of 1940. This figure was 1,900,000 higher than the corresponding total for 1939. The total taxable wages credited to the old-age and survivors insurance accounts of these 1940 workers was estimated at $32,900,000,000.

Industry Paying More Than Half of Earnings in Income, Profits Taxes

■ AMERICAN industry is contributing more than one-half of its earnings to the United States Treasury in the form of income and excess profits taxes.

As result of the higher federal levies imposed by last year's revenue bill, net profits of many companies in 1941 showed little gain over 1940 earnings despite the highly accelerated rate of production. In some instances, the higher taxes have taken all the increased earnings, leaving net profits no larger than in the preceding year.

In the first nine months of 1941, the aggregate earnings (before federal income and excess profits taxes) taxes of 81 representative corporations amounted to $1,813,-761,074, compared with $1,004,637,-495 in 1940. During the same nine months in 1941 the money set aside by the 81 companies as reserves for federal income and excess profits taxes amounted to $941,365,889, compared with $293,925,827 in the corresponding period of 1940, a federal tax increase of over 220 per cent.

As result of the greater tax reserves the aggregate net income of the 81 companies for the first nine months of 1941 was $872,395,185, compared with $710,711,668 in the like period of 1940. Thus it is seen that the increase in net profits after taxes during the first three quarters of 1941 compared with the corresponding 1940 period amounted to less than 23 per cent whereas the increase in earnings before taxes amounted to 80½ per cent.

These figures and the accompanying tabulation, page 51, were developed in a recent survey by the American Federation of Investors Inc., Chicago, a nonpartisan and not-for-profit organization.

Reserves set aside for federal income taxes during the first nine months of 1941 mounted to about 52 per cent of taxable earnings, compared with 29 per cent in the corresponding 1940 period.

All taxes in 1940, including local, state and federal, amounted to 56 per cent of total earnings before taxes. What percentage of earnings will be taken by all taxes in 1941 cannot yet be estimated.

Industry's Taxes for 1941 Running Three Times Ahead of 1940

Name of Company	(First Nine Months) EARNINGS, Before Federal Income and Excess Profits Taxes		(First Nine Months) FEDERAL TAXES—Reserves for Income and Excess Profits Taxes		(First Nine Months) NET INCOME, After Provision for Federal Taxes	
	1941	1940	1941	1940	1941	1940
Air Reduction Company, Inc.	$10,800,734	$ 6,345,123	$ 5,565,932	$ 1,543,654‡	$ 5,234,802	$ 4,801,469
Allegheny Ludlum Steel Corp.	10,879,434	4,323,326	6,890,198	1,542,041	3,989,236	2,781,285
Allis-Chalmers Mfg. Co.	8,935,793	5,870,397	4,765,000	2,101,000	4,170,793	3,769,397
American Cyanamid Company	12,307,565	6,214,972	7,984,500①	2,055,000①	4,323,065	4,159,972
Amer. Radiator & S. S. Corp.	10,571,849	4,948,806	5,400,000	1,228,000‡	5,171,849	3,720,806
American Steel Foundries	7,514,967	2,748,946	4,731,000	668,500‡	2,783,967	2,080,446
Amer. Water Wks. & Elec. Co.	7,580,320	5,551,125	4,935,372	2,793,736	2,644,948	2,757,389
Atlas Powder Company	4,667,447	1,727,079	3,341,350③	599,818③	1,326,097	1,127,261
Borg-Warner Corporation	14,509,980	5,910,170	8,159,050③	1,784,939‡	6,350,930	4,125,231
Brunswick-Balke-Collender Co.	2,589,240	2,525,849	1,067,000	887,000④	1,522,240	1,638,849
Butler Brothers	2,676,705	270,228	1,050,000	65,700‡	1,626,705	204,528
Celanese Corp. of America	10,441,361	8,722,590	5,325,000	3,506,765	5,116,361	5,215,825④
Chrysler Corporation	52,460,848	45,106,094	23,000,000⑥	14,400,000⑥	29,460,848	30,706,094
Cities Service Company	17,197,657	11,959,020	8,511,329‡	4,413,846‡	8,686,328	7,545,174
City Ice & Fuel Company	3,637,928	2,196,660	1,196,076‡	569,856‡	2,441,852	1,626,804
Coca-Cola Co.	43,248,600	33,228,887	19,857,000‡	11,350,000‡	23,391,600	21,878,887
Columbia Broadcasting System⑦	6,815,435	5,077,758	3,000,000	1,600,172	3,815,435	3,477,586
Columbia Gas & Elec. Corp.	18,283,804	15,500,788	10,336,390	5,751,003	7,947,414	9,749,785
Commonwealth Edison Company	32,490,856	28,320,782	13,329,103	7,245,784‡	19,161,753	21,074,998
Condé Nast Publications	404,209	275,656	135,002‡	81,777‡	269,207	193,879
Crown Cork & Seal Company	4,386,927	2,506,689	1,773,257	423,981⑤	2,613,670	2,082,708
Curtis Publishing Company	2,279,986	3,374,255	651,600	750,175‡	1,628,386	2,624,080
Cutler-Hammer, Inc.	3,261,060	1,556,191	2,018,518	630,964⑧	1,242,542	925,227
Diamond Match Company	2,709,946	2,439,517	1,210,462⑨	974,281⑨	1,499,484	1,465,236
Douglas Aircraft Company⑩	21,577,289	9,352,166	10,844,243	2,063,831‡	10,733,046⑪	7,288,335
Du Pont de Nemours & Co⑫	142,673,664	98,328,497	74,420,000	30,400,000	68,253,664	67,928,497
General Electric Company	119,471,681	63,994,776	82,000,000	26,900,000‡	37,471,681	37,094,776
General Foods Corporation	19,948,184	13,792,707	9,272,429	3,379,470‡	10,675,755	10,413,237
General Motors Corporation	367,242,107	181,713,355	205,993,000	52,472,000‡	161,249,107	129,241,355
Gillette Safety Razor Co.	5,174,990	4,239,536	2,841,653⑬	2,300,761⑬	2,333,337	1,938,775
Hershey Chocolate Company	7,394,337	5,662,417	2,447,461	1,395,881‡	4,946,876	4,266,536
Holland Furnace Company	1,804,209	1,472,205	634,055	368,046‡	1,170,154	1,104,159
Houdaille-Hershey Corp.	3,451,488	2,146,690	1,693,794	573,806‡	1,757,694	1,572,884
Inland Steel Company	28,357,247	13,415,669	17,109,905	3,527,185	11,247,342	9,888,484
Interlake Iron Corporation	3,045,022	13,584	1,221,000‡	.....	1,824,022	13,584⑭
Johns-Manville Corporation	14,056,586	6,717,694	9,567,602	3,191,369‡	4,488,984	3,526,325
Kimberly-Clark Corporation	3,659,080	2,467,775	1,449,500	581,500‡	2,209,580	1,886,275
Libbey-Owens-Ford Glass Co.	13,284,798	9,560,421	6,288,238	2,245,640‡	6,996,560	7,314,781
Link-Belt Co.	4,750,859	2,335,403	2,578,035	554,663‡	2,172,824	1,780,740
Louis. & Nashville R.R. Co.	19,585,290	7,414,142	6,647,800‡	1,447,200‡	12,937,490	5,966,942
Mead Corporation⑮	2,360,620	1,351,912	942,616	368,715‡	1,418,004	983,197
Mengel Company	1,407,462	192,188	634,046	38,601‡	773,416	153,587
Middle West Corporation	6,088,201	4,592,454	3,287,108	1,686,868	2,801,093	2,905,586
Mnpls.-Honeywell Regulator Co.	4,206,545	2,195,122	2,184,285	626,761‡	2,022,260	1,568,361
Monsanto Chemical Co.	12,316,301	5,891,789	7,379,722	2,350,820	4,936,579	3,540,969⑯
Mullins Manufacturing Corp.	1,786,313	316,395	1,094,500	61,000‡	691,813	255,395
National Cash Register Co.	3,946,656	1,947,971	1,397,922‡	455,586‡	2,548,734	1,492,385
National Gypsum Company	2,666,129	1,613,084	1,465,500	558,000	1,200,629⑰	1,055,084⑰
National Steel Corporation	27,271,847	14,203,822	14,349,575	3,362,694‡	12,922,272	10,841,128
National Supply Company	7,461,776	1,534,850	3,471,948⑱	545,201⑱	3,989,828	989,649
New York Central R.R. Co.	30,591,175	3,464,233	8,766,832‡	728,312‡	21,824,343	2,735,921
North American Company	25,250,902	20,873,035	8,778,997	6,737,363‡	16,471,905	14,135,672
Ohio Oil Company	9,754,016	8,419,260	1,949,728‡	1,265,369	7,804,288	7,153,891
Otis Elevator Company	3,372,948	3,117,957	1,480,000	565,000‡	1,892,948	2,552,957
Packard Motor Car Company	2,575,185	(d)1,439,064	804,347‡	.....	1,770,838	(d)1,439,064
Pennsylvania Railroad Co.	56,335,160	32,197,479	19,349,316‡	6,739,080‡	36,985,844	25,458,399
Peoples Gas Light & Coke Co.	4,679,617	3,000,710	1,498,126	769,699‡	3,181,491	2,231,011
Phillips Petroleum Company	17,441,156	10,595,533	4,878,558‡	1,817,000‡	12,562,598	8,778,533
Pittsburgh Screw & Bolt Corp.	2,677,113	820,999	1,686,581	246,000‡	990,532	574,999⑲
Pullman Incorporated	11,402,487	7,357,899	3,549,086‡	1,652,257‡	7,853,401	5,705,642
Radio Corporation of America	16,840,065	7,732,943	9,469,900‡	2,523,900‡	7,370,165	5,209,043
Raybestos-Manhattan, Inc.	5,074,546	2,022,159	3,328,652‡	662,537‡	1,745,894	1,359,622
Republic Steel Corporation	47,972,095	16,283,333	29,975,000	3,650,000	17,997,095	12,633,333
Revere Copper & Brass Inc.	12,060,510	3,555,099	8,800,000	1,850,000‡	3,260,510	1,705,099
Ruberoid Co.	1,828,269	672,525	753,898	146,100‡	1,074,371	526,425
Rustless Iron & Steel Corp.	5,386,201	1,401,340	3,676,000	634,000	1,710,201	767,340
Shell Union Oil Corporation	20,023,486	15,595,796	5,537,500‡	2,980,600‡	14,485,986	12,615,196
Standard Brands Incorporated	11,758,204	9,183,290	5,060,364	2,407,403‡	6,697,840	6,775,887
Stewart-Warner Corporation	5,135,070	1,509,321	3,764,959	514,637‡	1,370,111	994,684
Tide Water Associated Oil Co.	14,526,395	7,150,625	4,735,800	93,000‡	9,790,595	7,057,625
Union Pacific Railroad Co.	18,349,491	9,198,494	4,339,242‡	754,505‡	14,010,249	8,443,989
United Aircraft Corporation	50,783,036	18,788,855	40,011,304	9,589,087‡	10,771,732	9,199,768⑳
United Carbon Company	2,099,551	1,482,707	885,000	404,000‡	1,214,551	1,078,707
United Drug, Inc.	1,835,704	271,423	541,791‡	175,189‡	1,293,913	96,234
United Gas Improvement Co.	27,887,970	27,521,850	11,106,203	7,196,575‡	16,781,767	20,325,275
United States Steel Corp.	177,973,591	88,246,419	82,285,500	18,828,349‡	95,688,091	69,418,070
Walworth Company	2,785,272	640,945	1,473,452	135,275‡	1,311,820	505,670
Westinghouse Air Brake Co.	12,497,531	6,601,448	7,293,866	2,092,161‡	5,203,665	4,509,287
Westinghouse Elec. & Mfg. Co.	45,302,297	21,035,328	29,442,045	6,452,000	15,860,252	14,583,328
Wrigley (Wm.) Jr. Co.	11,281,213	9,569,456	4,670,562	2,801,142‡	6,610,651	6,768,314
Yellow Truck & Coach Mfg. Co.	22,639,486	4,598,566	16,024,204	1,091,697‡	6,615,282	3,506,869
Totals for 81 Companies	$1,813,761,074	$1,004,637,495	$941,365,889	$293,925,827	$872,395,185	$710,711,668

Footnotes: ‡Does not include provision for excess profits tax. (d) Deficit. ①Federal and foreign income tax. ②1941, provision for excess profits tax, Federal income tax, etc.; 1940, Federal income tax, etc. ③Includes provision for excess profits tax and Canadian taxes. ④Includes provision for excess profits tax in amount of $300,000, which was adjusted at the 1940 year end to $130,000 for full year 1940. ⑤Adjusted. ⑥1940, provision for excess profits tax, income taxes, etc.; 1940, income taxes, etc. ⑦Report for 40 weeks to Oct. 4, 1941; 39 weeks to Sept. 28, 1940 adjusted. ⑧Federal and state income tax. ⑨Income taxes, etc.; no provision necessary for excess profits tax. ⑩Report for nine months ending Aug. 31. ⑪Before $630,000 additional provision for estimated loss on military contracts. ⑫Earnings include income from General Motors investment. ⑬Foreign and domestic income and U.S. capital stock taxes. ⑭Before Federal income taxes. ⑮Report for 40 weeks to Oct. 4, 1941 and to Oct. 5, 1940. ⑯Before dividends received from British subsidiaries. ⑰After preferred dividends paid. ⑱Federal normal income and defense taxes, state and foreign income taxes, and Federal excess profits tax. ⑲Before excess profits tax, if any. ⑳As reported; adjusted income amounted to $10,461,127. (Tabulation above based on interim reports).

STEEL

Direct Action Replaces Debate

■ WITHIN the span of a few days Donald M. Nelson almost single-handed has done more to speed production for war than all of his numerous predecessors in the alphabetical agencies of the defense period.

He has done it by streamlining the war production organization and by adopting several fundamental administrative policies.

• • •

The principal changes in organization are in the direction of simplification and coordination. As far as one can judge from the initial blueprint, Mr. Nelson is attempting to devise a straight line of concentrated authority. Reporting to Mr. Nelson as chief of WPB will be the heads of five divisions—purchases, production, materials, civilian supply and industrial operations.

Under the division of industrial operations will be industry branches. The problems of converting facilities to war output, priorities, allocations, etc. will center in this division.

This fairly simple structure will afford a clarification and concentration of authority which was impossible under the previous cumbersome setup. The Nelson plan also provides for advisory committees and even a planning board or brain trust. However, these agencies will be in detached positions; they will not be permitted to clog the stream of executive functioning.

The obvious improvement in organization is extremely important, but no more so than the principles Mr. Nelson has announced in connection with his administration.

His divisional and branch chiefs will be clothed with extraordinary authority. To illustrate the powers they will exercise, Mr. Nelson intimated that "if there are tools in Ford's factory that are needed in General Motors . . . they will be moved over."

In announcing the appointment of Ernest Kanzler to the job of converting the automobile industry to war output, Nelson stated that Kanzler will head "no debating society."

Asked how much voice labor will have in the new set-up, Nelson replied that when the time comes to select a man for an important job in WPB, "I'm not going to think of whether he represents labor or industry—I'm ready to give him the job if he has the capacity to do it."

• • •

These three policies—placing equipment where it is needed most, substituting decisive action for debate and selecting men on merit—are distinctly revolutionary according to New Deal and defense era standards.

It will be a refreshing innovation to know that a Nelson man can issue orders without first having to debate the issue with a host of kibitzing bureaucrats.

It will be an even greater novelty to see good men appointed to jobs solely for the reason they are eminently qualified to hold them.

Mr. Nelson's new policies are absolutely necessary to the success of the war effort. They are at least a year over-due. They will help win the war if. . . .

If the President will support Mr. Nelson to the hilt.

E. L. Shaner

EDITOR-IN-CHIEF

Jan. 26, 1942

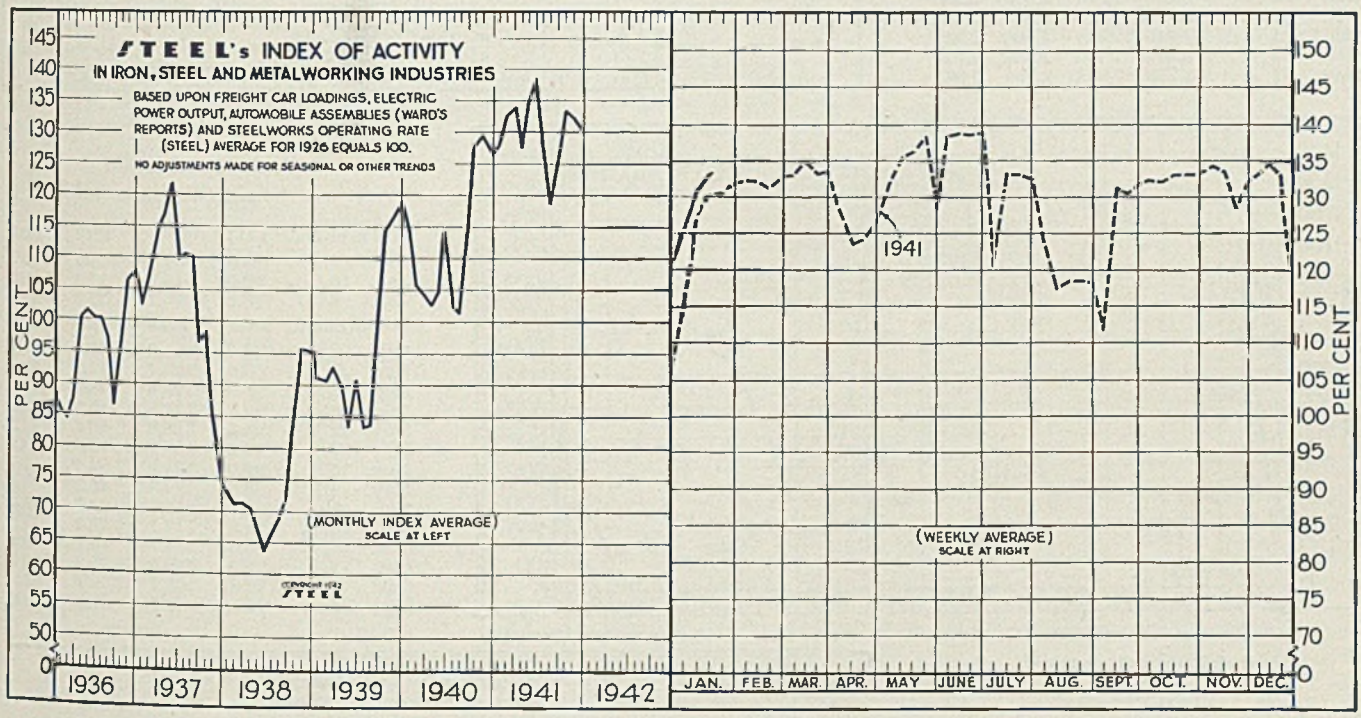
The BUSINESS TREND

Shift to War Basis Gains Momentum

■ CONVERSION to war production among numerous civilian goods manufacturers is making encouraging progress. Many small concerns, no longer able to obtain raw materials for normal operations, are seeking defense contracts. This transition from civilian to military goods production is being facilitated as much as possible by government officials. Industry is expected to be on an efficient war footing soon, with a consequent sharp increase in output of war goods indicated for the near future.

STEEL's index of activity advanced 1.9 points to 133.1 during the week ended Jan. 17. The index has recovered nearly all the ground lost during the year-end holiday period, and compares favorably with the 130.8 level recorded at this time last year.

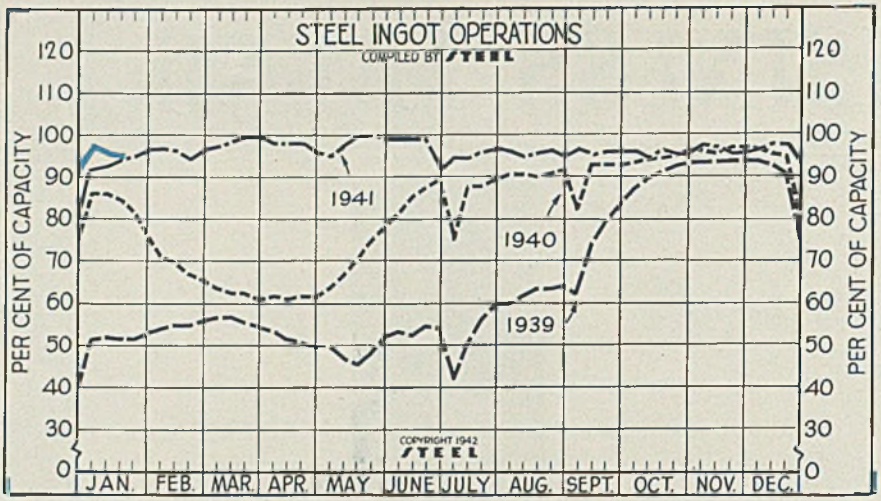
Slight decline in steelmaking operations and electric power consumption during the latest period was more than offset by a moderate upturn in automobile assemblies and a substantial increase in revenue freight carloadings. During the week ended Jan. 17 the national steel rate eased one half point to 96 per cent of capacity, while electric power output totaled 3,450,468,000 kilowatts. Automobile production edged upward to 75,025 units.



STEEL'S index of activity gained 1.9 points to 133.1 in the week ended Jan. 17:

Week Ended	1941	1940
Nov. 15	133.8	130.3
Nov. 22	128.4	124.7
Nov. 29	132.2	132.6
Dec. 6	133.4	132.5
Dec. 13	134.8	132.6
Dec. 20	132.9	132.4
Dec. 27	120.5	107.5
Week Ended	**1942**	**1941**
Jan. 3	124.7	114.5
Jan. 10	131.2	128.2
Jan. 10	133.1	130.8

Mo. Data	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
Jan.	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6
Feb.	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2
March	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4	98.6
April	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7
May	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2
June	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8
July	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9
Aug.	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4
Sept.	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7
Oct.	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8
Nov.	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0
Dec.	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3



Steel Ingot Operations

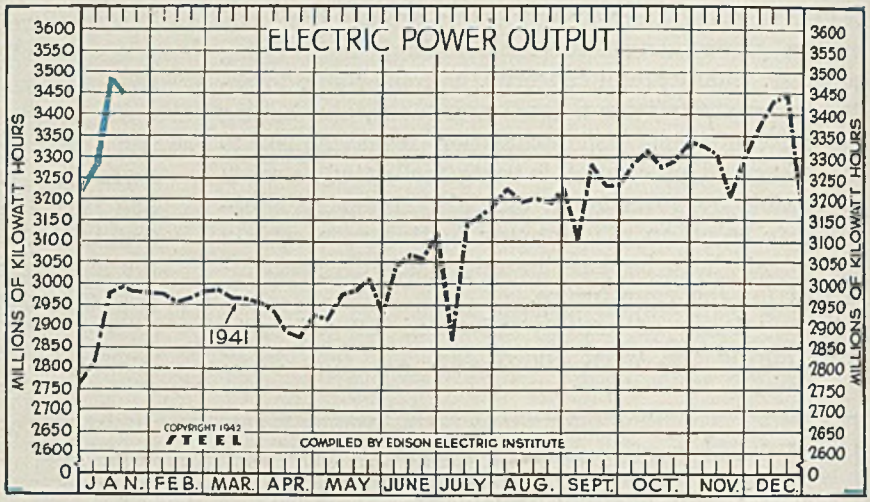
(Per Cent)

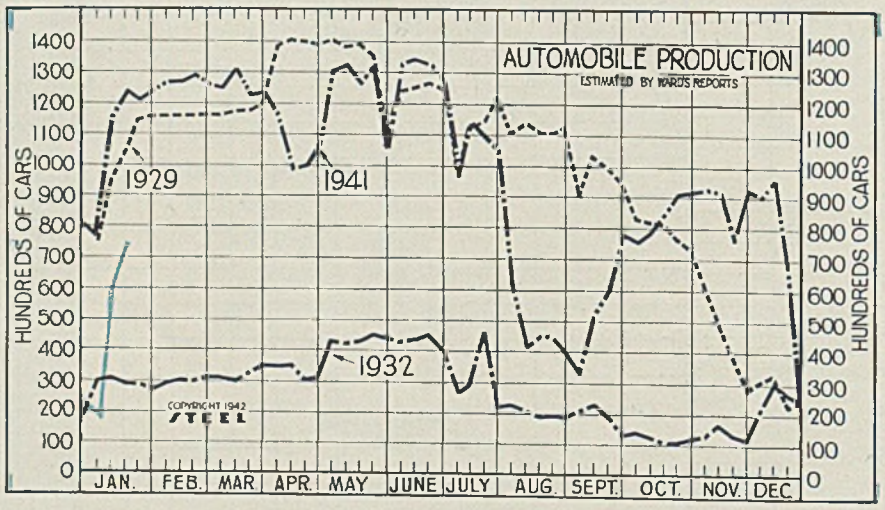
Week ended	1942	1941	1940	1939
Jan. 17....	96.0	94.5	84.5	51.5
Jan. 10....	96.5	93.0	86.0	52.0
Jan. 3....	97.5	92.5	86.5	51.5
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27....	93.5	80.0	75.5	40.0
Dec. 20....	97.5	95.0	90.5	52.0
Dec. 13....	97.1	95.5	92.5	58.0
Dec. 6....	96.5	96.5	94.0	61.0
Nov. 29....	95.0	97.0	94.0	61.0
Nov. 22....	95.5	97.0	93.5	62.0
Nov. 15....	97.0	96.0	93.5	63.0
Nov. 8....	97.5	96.5	93.0	61.5
Nov. 1....	95.5	96.5	93.0	57.5
Oct. 25....	95.5	95.5	92.0	54.5
Oct. 18....	96.5	95.0	91.0	51.5
Oct. 11....	94.5	94.5	89.5	51.5
Oct. 4....	96.0	93.5	87.5	48.5
Sept. 27....	96.0	93.0	84.0	47.0

Electric Power Output

(Million KWH)

Week ended	1942	1941	1940	1939
Jan. 17.....	3,450	2,996	2,674	2,342
Jan. 10.....	3,473	2,985	2,688	2,329
Jan. 3.....	3,287	2,831	2,558	2,239
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27.....	3,234	2,757	2,465	2,175
Dec. 20.....	3,449	3,052	2,712	2,425
Dec. 13.....	3,431	3,004	2,674	2,390
Dec. 6.....	3,369	2,976	2,654	2,377
Nov. 29.....	3,295	2,932	2,605	2,335
Nov. 22.....	3,205	2,839	2,561	2,248
Nov. 15.....	3,304	2,890	2,587	2,325
Nov. 8.....	3,339	2,858	2,589	2,277
Nov. 1.....	3,339	2,882	2,609	2,271
Oct. 25.....	3,299	2,867	2,622	2,284
Oct. 18.....	3,273	2,838	2,576	2,281
Oct. 11.....	3,315	2,817	2,584	2,251
Oct. 4.....	3,290	2,792	2,554	2,229
Sept. 27.....	3,233	2,816	2,559	2,208





Auto Production

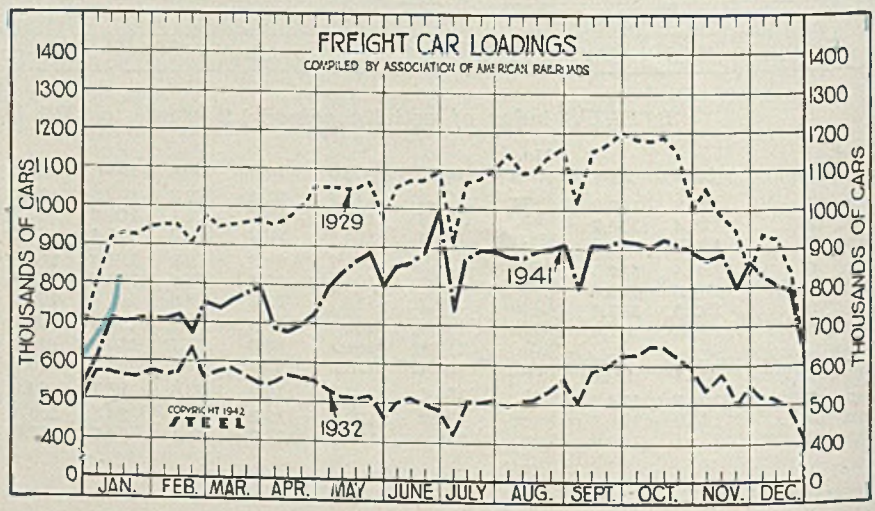
(1000 Units)

Week ended	1942	1941	1940	1939
Jan. 17....	75.0	124.0	108.5	90.2
Jan. 10....	59.0	115.9	111.3	86.9
Jan. 3....	18.5	76.7	87.5	76.7
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27....	24.6	81.3	89.4	75.2
Dec. 20....	65.9	125.4	117.7	92.9
Dec. 13....	96.0	125.6	118.4	102.9
Dec. 6....	90.2	124.8	115.5	100.7
Nov. 29....	93.5	128.8	93.6	97.8
Nov. 22....	76.8	102.3	72.5	84.9
Nov. 15....	93.0	121.9	86.7	96.7
Nov. 8....	93.6	120.9	86.2	86.3
Nov. 1....	92.9	118.1	82.7	80.0
Oct. 25....	91.9	117.1	78.2	73.3
Oct. 18....	85.6	114.7	70.1	68.4
Oct. 11....	79.1	108.0	75.9	50.5
Oct. 4....	76.8	105.2	76.1	37.7
Sept. 27....	78.5	96.0	62.8	25.4

Freight Car Loadings

(1000 Cars)

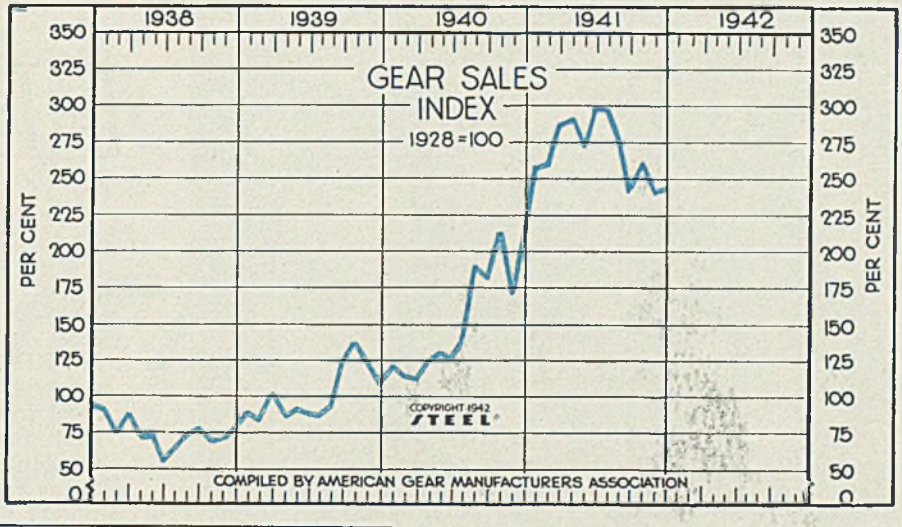
Week ended	1942	1941	1940	1939
Jan. 17.....	811	703	646	590
Jan. 10.....	737	712	668	587
Jan. 3.....	674	614	592	531
Week ended	**1941**	**1940**	**1939**	**1938**
Dec. 27.....	607	545	550	500
Dec. 20.....	799	700	655	574
Dec. 13.....	807	736	681	606
Dec. 6.....	833	738	687	619
Nov. 29.....	866	729	689	649
Nov. 22.....	799	733	677	562
Nov. 15.....	884	745	771	657
Nov. 8.....	874	778	786	637
Nov. 1.....	895	795	806	673
Oct. 25.....	914	838	834	709
Oct. 18.....	923	814	861	706
Oct. 11.....	904	812	845	727

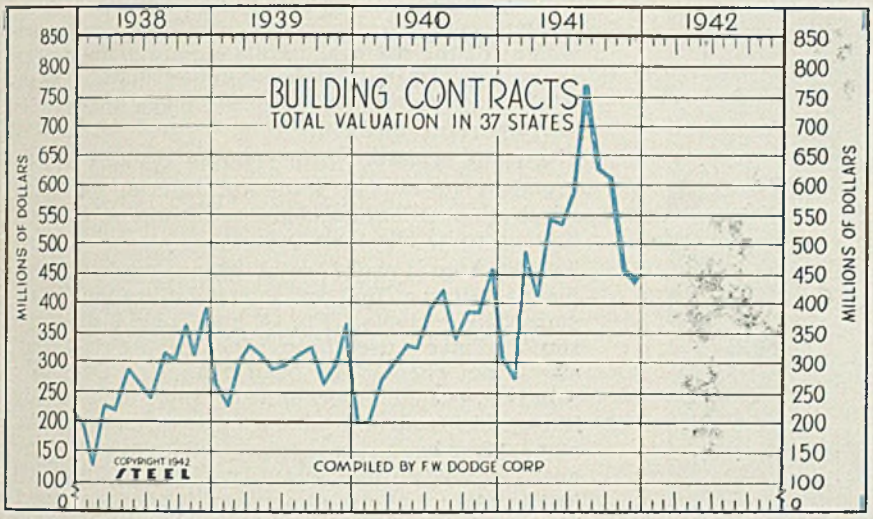


Gear Sales Index

(1928 = 100)

	1941	1940	1939	1938	1937
Jan.	259	123	91.0	93.0	144.0
Feb.	262	116	86.0	77.0	130.5
Mar.	288	114	104.0	91.0	195.0
April	292	128	88.0	74.0	164.0
May	273	133	93.0	70.0	125.5
June	299	129	90.0	58.0	134.0
July	298	141	89.0	67.0	124.0
Aug.	276	191	96.0	76.5	125.0
Sept.	243	183	126.0	80.5	123.0
Oct.	261	216	141.0	72.5	139.5
Nov.	241	173	126.0	72.0	127.5
Dec.	243	208	111.0	81.0	97.0
Ave.	269.6	155.0	103.0	76.0	135.5





Construction Total Valuation In 37 States

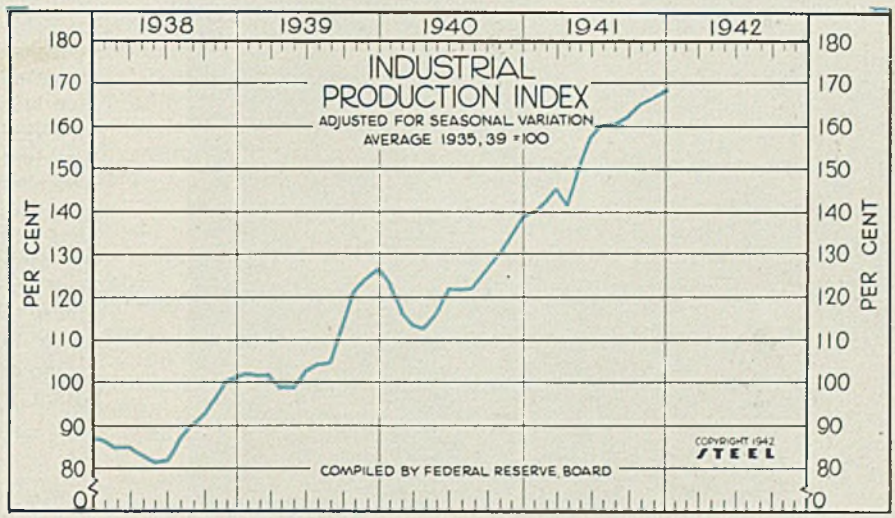
(Unit: $1,000,000)

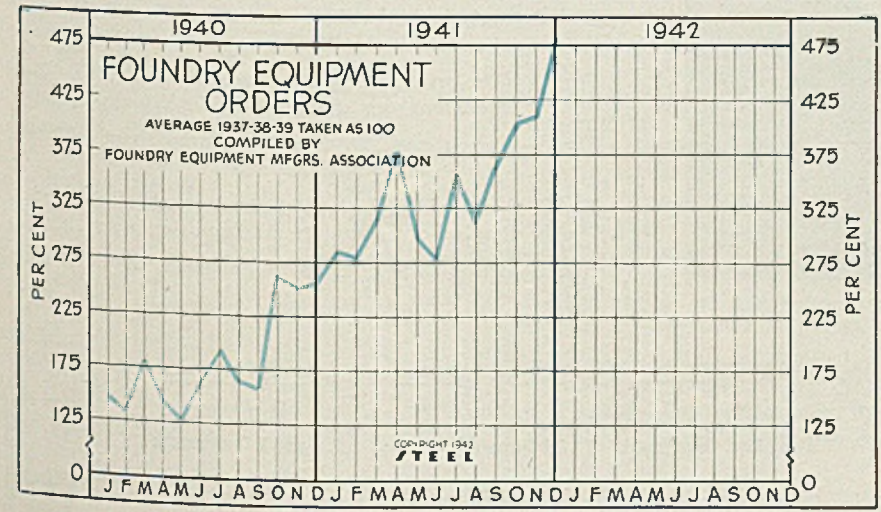
	1941	1940	1939	1938	1937
Jan.	$305.2	$196.2	$251.7	$192.2	$242.7
Feb.	270.4	200.6	220.2	118.9	188.3
Mar.	479.9	272.2	300.7	226.6	231.2
April	406.7	300.5	330.0	222.0	269.5
May	548.7	328.9	308.5	283.2	243.7
June	539.1	324.7	288.3	251.0	317.7
July	577.4	398.7	299.9	239.8	321.6
Aug.	760.3	414.9	312.3	313.1	281.2
Sept.	623.3	347.7	323.2	300.9	207.1
Oct.	606.3	383.1	261.8	357.7	202.1
Nov.	458.6	380.3	299.8	301.7	198.4
Dec.	431.6	456.2	354.1	389.4	209.5
Ave.	$500.6	$333.7	$295.9	$266.4	$242.8

Industrial Production
Federal Reserve Board's Index

(1935-39 = 100)

	1941	1940	1939	1938	1937
Jan.	139	122	102	86	116
Feb.	141	116	101	84	117
March	143	112	101	84	120
April	140	111	97	82	120
May	150	115	97	80	121
June	157	121	102	81	119
July	160	121	104	86	120
Aug.	160	121	104	90	120
Sept.	161	125	113	92	115
Oct.	163	129	121	95	107
Nov.	167	133	124	100	95
Dec.	168	138	126	101	87
Year Ave.	156	123	108	88	113





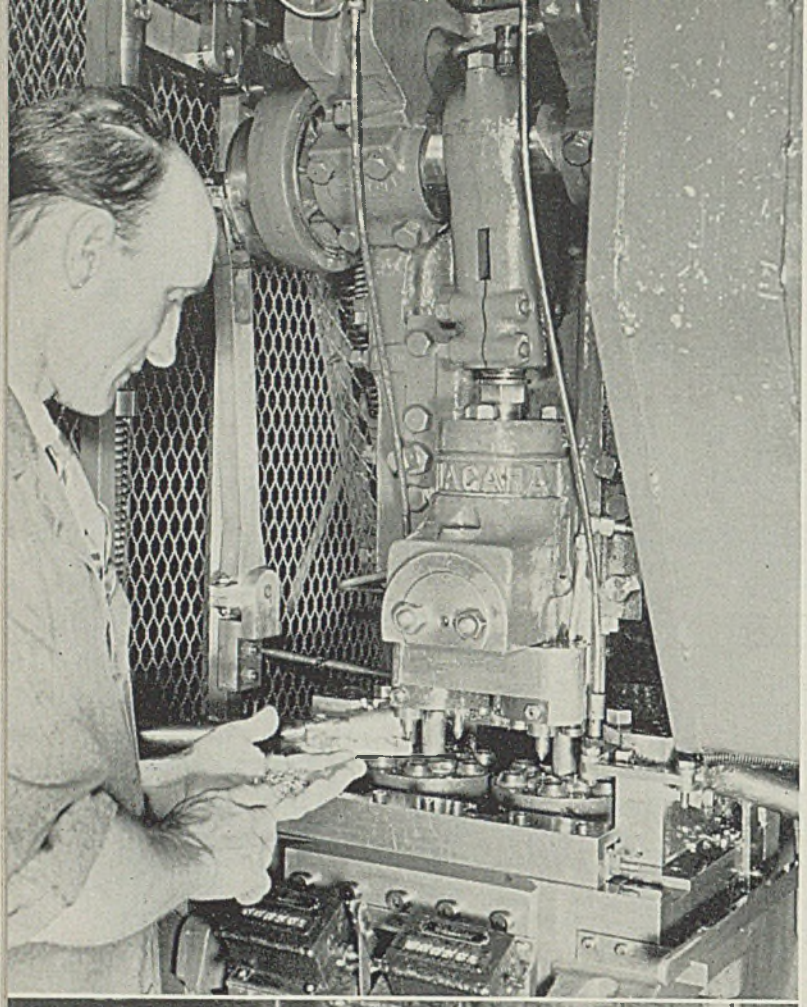
Foundry Equipment Orders

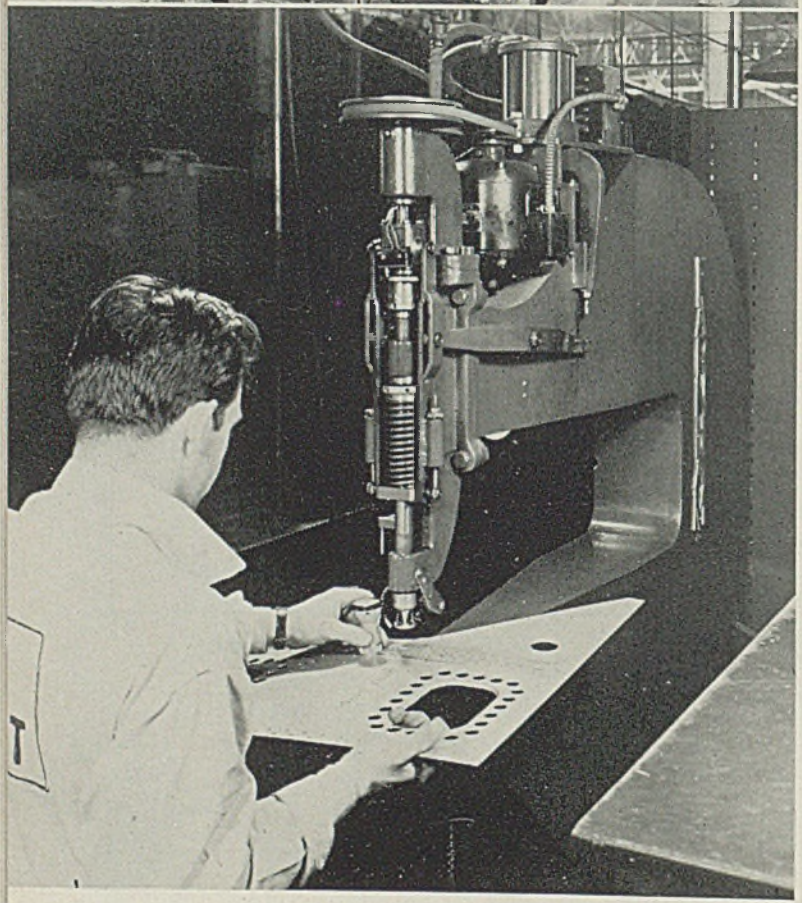
Monthly Average

(1937-38-39 equals 100)

	1941	1940
Jan.	285.3	149.0
Feb.	281.1	135.7
March	315.2	183.2
April	377.2	145.2
May	298.7	129.1
June	281.1	164.9
July	358.1	194.4
Aug.	312.9	165.4
Sept.	363.8	161.2
Oct.	403.8	264.0
Nov.	408.5	254.2
Dec.	481.2	257.8
Year	345.6	184.0

FLUSH-RIV





■ PRIMARY reason for development of flush riveting is that it adds speed to the plane, one of the most important factors in fighting aircraft. This additional speed arises from the decreased air friction caused by removal of projecting rivet heads from the air stream.

An additional advantage of no small importance is that countersunk rivets eliminate the entire weight of the old head, while simply dimpling the sheet cuts off half the weight of the old head. With 60,000 to 800,000 rivets per plane, this can be an important factor.

Various types of flush riveting systems will be found in the aircraft industry, differing one from another according to engineers' ideas on the best method to handle the work.

First step toward establishing most efficient flush riveting at Bell was to standardize the dimensions of the rivets. Fig. A and Table I show the standard rivets used here. Incidentally rivet head size is not checked by head diameter. Obviously this is impossible mechanically since theoretically it extends from one sharp edge to another. Instead, rivet head size is measured by height of the head—a measurable quantity. The B dimension in Fig. A, not the A dimension, is therefore used. Note that the proportions of one rivet to any other in Table I are the same—except length. Tolerances are plus or minus 0.002-inch, the tolerance expected above or below the level of the sheet surface of a finished driven rivet.

Selection of 120 degrees as the included angle of the rivet head is based on exhaustive experiments which showed that the sheet is first to fail, subsequent shear distortion being the cause of the rivet head shearing out of the rivet shank, even with the almost flat head angle. Obviously the rivet head is not the weak point—thus the emphasis given to dimpling (the forming of the sheet to same taper as the rivet head).

One of the first problems was to develop a gage which would measure depth of countersinks and

Fig. 1. (Left above)—Duplex rivet forging machine turns out precision rivets by the hundred thousand

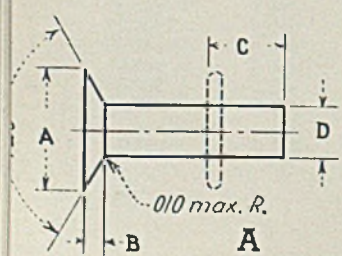
Fig. 2. (Left center)—Operator using drop-ball gage to check conical cut in countersinking

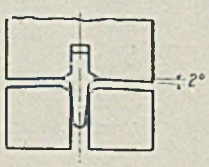
Fig. A—Design of standard rivet used at Bell. Dimensions are given in Table I, p. 58

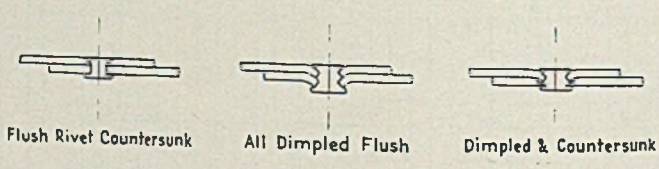
Fig. B—Punch and die used to dimple sheet to take flush rivets

Fig. C—Left to right, flush-rivet-countersunk, all-dimpled-flush, dimpled-and-countersunk flush riveting systems

Fig. D—Three of four steps in precision forging rivets







ETING TECHNIQUE

At Bell Aircraft

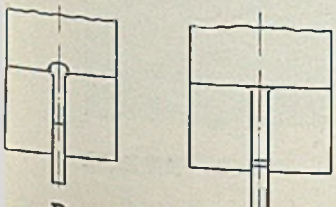
Standardization and simplification of rivet design; development of special rivet forging machines, an accurate gaging system and an improved dimpling method contribute to highly efficient rivet structures with smooth outer surfaces

By HARRY W. ASHBURN
Chief Tool Designer
Bell Aircraft Corp.
Buffalo

dimples accurately. It was decided to use the depth to which a known size ball would drop from the surface of the sheet into the countersink or dimple as a measure of its depth. Contacting the conical depression at a point about half way between the upper level of the sheet and the hole for the rivet stem, the accuracy of the measurement is not affected by any slight error in angle of the walls of the depression.

The gage that resulted from approaching the problem from this angle is shown in Fig. 3. It is furnished with various sized balls and heads to cover various ranges of dimpling and countersinking. In the illustration, a mirror is leaned against the front of the case containing other ball sets to show the ball extending from the back side of the gage. Such a gage has been found to speed up testing time greatly as only one test is required instead of several by other gaging methods. In addition, the result is read in thousandths of an inch, a very definite figure which in turn speeds up the adjustment of riveting machines and tools. In Fig. 2 the operator is using the gage to measure the depth of countersunk holes.

Dimpling: The first step in preparing the drilled or punched hole for the flush rivets is to form a dimple or protrusion on the under side of the sheet into which the conical rivet head may set. This comparatively simple operation, however, is not without its difficulties, since sheet aluminum alloy will stretch but about 12 per cent and then only if handled carefully. Dimpling machine at Bell Aircraft, shown in Fig. 5, uses both punch and die made with 115-degree included angle. The allowable stretch of 12 per cent is not exceeded when forming dimples with these tools. The divergence of 5 degrees between the 120-degree rivet and 115-degree dimple is useful in making the sheet lie flat on the substructure. Some of the divergence of course is also taken up in spring back.



Since dies and punches are formed to the same angle, no coining or metal flow occurs in dimpling, thus avoiding any possibility of work hardening the metal around the rivet.

As a further precaution against heat deformation and secondary dimples, a reserve angle of 2 degrees is provided on all dimpling tools as shown in diagram, Fig. B. The slight upward protrusion formed in the work by this angle disappears when the rivet is driven.

Countersinking: As shown in Fig. C, an outer flush riveted surface may involve at least three different types of riveted connection. In the "flush rivet countersunk" form, the outer sheet is not dimpled but is countersunk; the second sheet being simply drilled. Such a joint, although it provides the flush outer surface desired, is not quite as strong as the other two types shown in Fig. C since the effective thickness of the outer sheet is decreased considerably due to the taper cut in countersinking.

The "all-dimpled flush" design shown in Fig. C avoids this by dimpling both outer sheet and second sheet so that full thickness of the sheet stock is maintained.

For many applications, a sheet is riveted to a heavier structural member, in which case the dimpled and countersunk joint can be used effectively. Here the outer sheet is dimpled and the second or structural member is countersunk the desired distance to take the dimple of the outer sheet. Since this may be only a fraction of the total thickness of the second sheet, its strength may not be cut seriously by removal of this metal in countersinking.

To control countersinking accurately, a special setup shown in Fig. 4 is utilized. As shown in the diagram in the inset, Fig. 4, a pressure foot is utilized to hold the sheets down while countersinking. The upper end of the foot is used to gage the depth of the cut. The two sickle-shaped cutting edges of the bit produce a draw cut. These cutters of carbon steel drill rod have their tangs and contours turned in screw machines, then are tempered and subsequently have flutes cut in and sharpened on a grinding rig.

The pilot for locating the cutter is mounted in a stationary bed. Two levers alongside it are connected to a switch so that as a sheet engages the pilot, power is applied to rotate the cutter. Action of the cutter is controlled through a time delay relay so power is applied to it for a period just long enough to provide a few revolutions of the bit after the gaging collar has stopped accurately the downward motion of the cutter. This produces a smooth, true countersunk surface. Cutters run at 900 revolutions per minute, giving an excellent finish and accurately cut depth.

As shown in the closeup, Fig. 4, a spot light is provided to focus light on the pilot to aid the operator in locating the work quickly. In this same illustration can be seen the tube extending down from the left. It is connected to an air line through an automatic valve to blow the chips away during the cutting operation. The two projecting arms alongside the pilot trip the switch which controls application of power to the cutter. The switch then is tripped by the arms as the operator brings the pressure foot down over the work after it is located in the pilot. Such a setup conserves power since en-

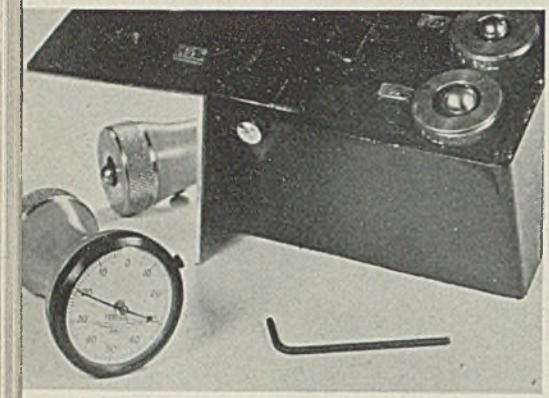


Fig. 3—Drop-ball gage employs interchangeable heads to cover wide range of conical depressions in dimpling and countersinking for flush rivets

TABLE I—Dimensions of Flush Rivets, Inches

Size	A	B	C	D
No. 1	0.125	+0.001 0.018–0.000	3/32	+0.002 1/16–0.000
No. 2	0.187	+0.001 0.027–0.000	9/64	+0.002 3/32–0.000
No. 3	0.250	+0.001 0.036–0.000	3/16	+0.0025 1/8–0.0000
No. 4	0.312	+0.001 0.045–0.000	15/64	+0.003 5/32–0.000
No. 5	0.375	—0.001 0.054–0.000	9/32	+0.003 3/16–0.000
No. 6	0.500	+0.001 0.072–0.000	3/8	+0.004 1/4–0.000

Note: For dimensions A, B, C and D, see Fig. A.

ergy is not applied to the cutter except when actually cutting.

As shown in Fig. 2, cutter head and pressure foot are brought down on the work by means of an air cylinder, the valve of which is actuated by a foot pedal so the operator's hands are free to move the sheet from hole to hole rapidly. The operator checks the depth of the countersunk hole frequently by means of the special gage mentioned above and shown in Fig. 3.

Rivet Making: In order to have a reliable supply of rivets for this precise work, Bell engineers developed an improved design of rivet forging machine shown in Fig. 1. This machine is really two production units in one since it has two sets of dies and is fed from two coils of wire through the two tubes seen running down the front of the machine. Note the two smaller ducts leading into the upper mounting of these tubes. These smaller tubes conduct lubricating fluid to the wire as it is fed into the machine.

This rivet forging unit features three additional stations in the die sequence as compared with usual rivet forging machines. In the first stage, illustrated at left, Fig. D, the material for a rivet head is gathered in a spherical lump and centered over the die. In the second stage, the centering is carried a little further to provide a shoulder to back up the head in the final operation, see center diagram in Fig. D. In both of these operations, a backup pin is used to position the length of wire in the dies. In the third stage, shown at the right Fig. D, the backup pin is dropped so any excess material in the head is forced down into the stem rather than allowed to form flash on the side of the head. *A fourth stage, not illustrated, is a final coining operation, with the backup pin dropped.*

This sequence of operations produces a rivet whose tolerances can be held extremely close. Overall length is controlled within satisfactory limits by accurately gaging the length of wire initially introduced into the dies. It has been found that this method of making rivets gives exceptionally long tool and machine life. Dies last at least five times as long as ordinarily. Too, only a fraction of the usual power for heading is required because the material is not confined at any point in the forming operation.

At the same time, the sequence of forming operations work hardens the rivet head slightly and creates a desirable grain flow into the shank, increasing the toughness in this section.

Releasing the backup pin in the final *two* stages reduces the possibility of hardening the rivet end—

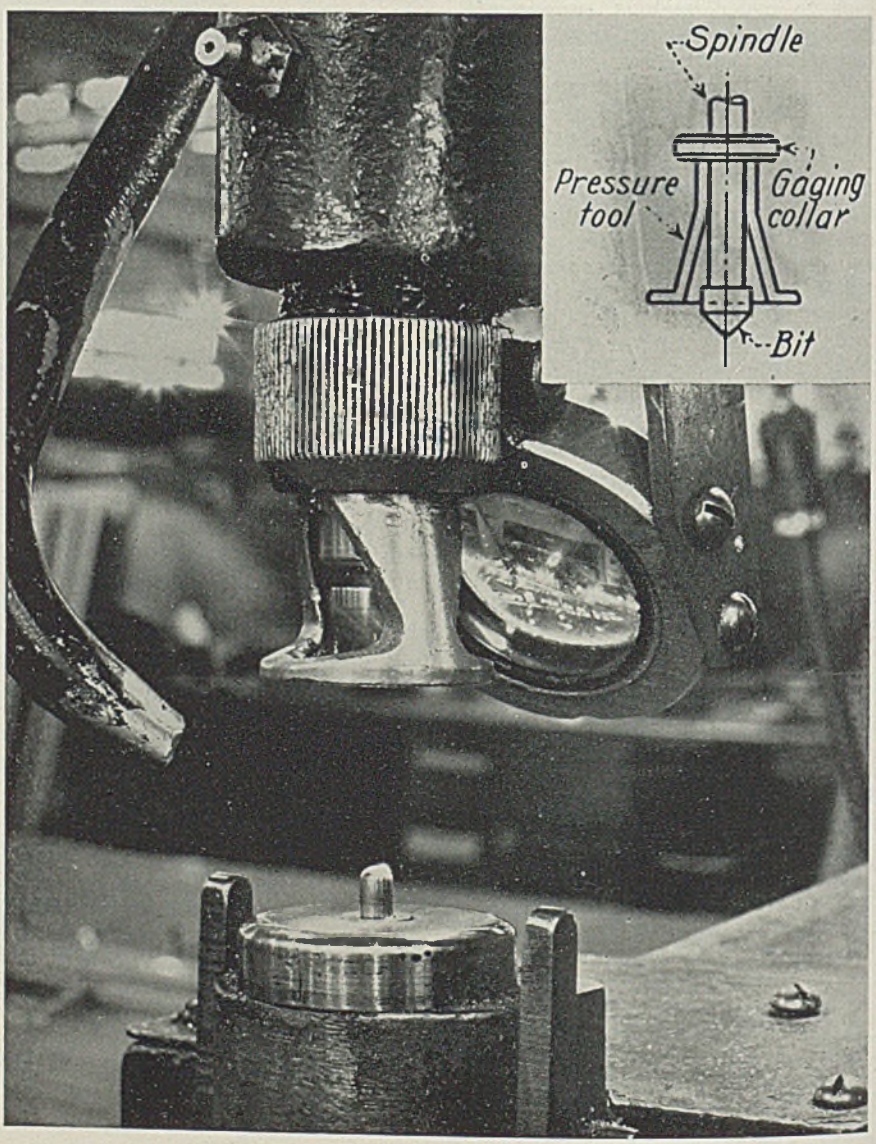


Fig. 4—Closeup of countersinking head showing pilot for centering cutter with pipe for blasting away chips during cut. Inset shows details of bit

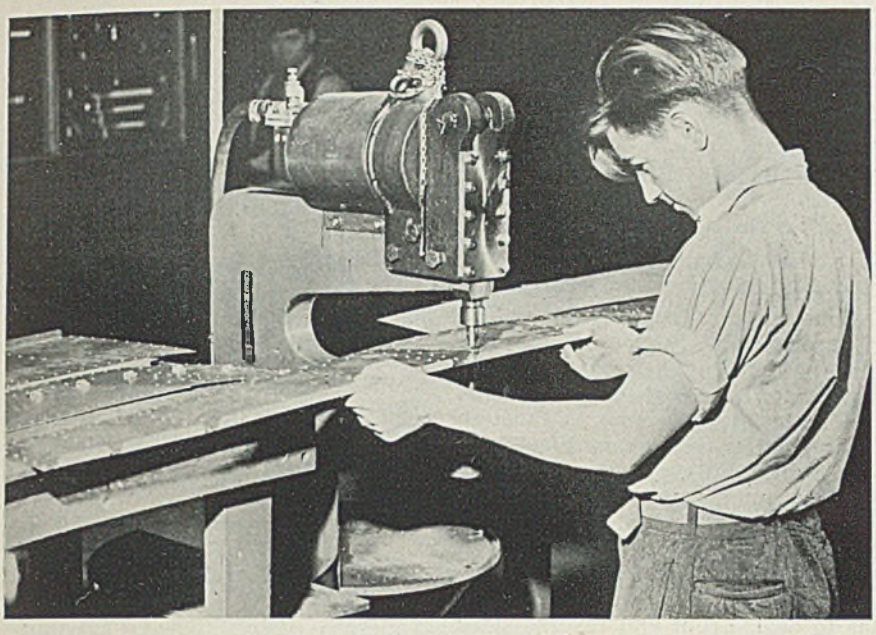


Fig. 5—Dimpling machine is air operated through foot valve

a feature that improves the driving qualities of the rivet since it will drive with maximum accuracy and minimum back pressure.

Some idea of the importance of the savings effected by use of this duplex rivet forging machine can be had from the following: Estimates were recently made for a plant using 600,000 rivets per day, 300 days per year. Cost of rivets purchased from an outside source would be around $120,000. When made on the Bell duplex rivet forger, the total cost would be only $72,600—an estimated annual saving of $47,400. This is based on cost of material of $42,000; labor and overhead, two shifts, $7200; anodizing and heat treating, $11,400; miscellaneous expense, $12,000.

In addition to these direct savings, other advantages accrue through being able to control the supply, eliminate production delays due to shortages, reduce inventory investment and handling. These also are important advantages. Thus such a company would easily save $50,000 on only $120,000 worth of rivet business.

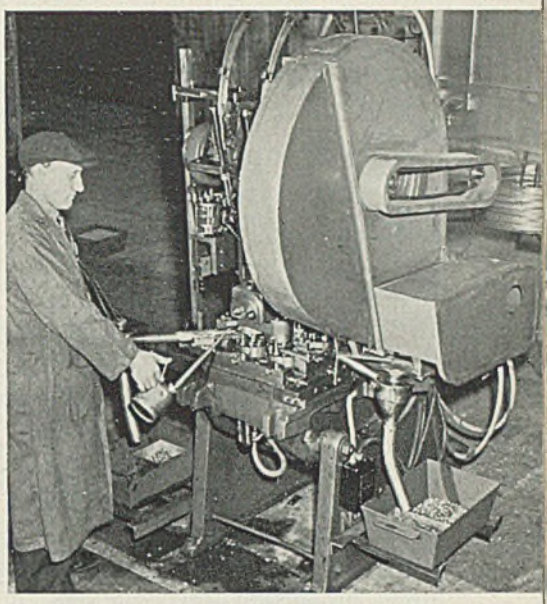


Fig. 6—Latest model of Bell duplex rivet making machine. Note wire feeds from coils at back; two sets of dies; two discharge chutes for finished rivets; etc

REVOLVING JIGS

Take Work Up to 85 Feet long

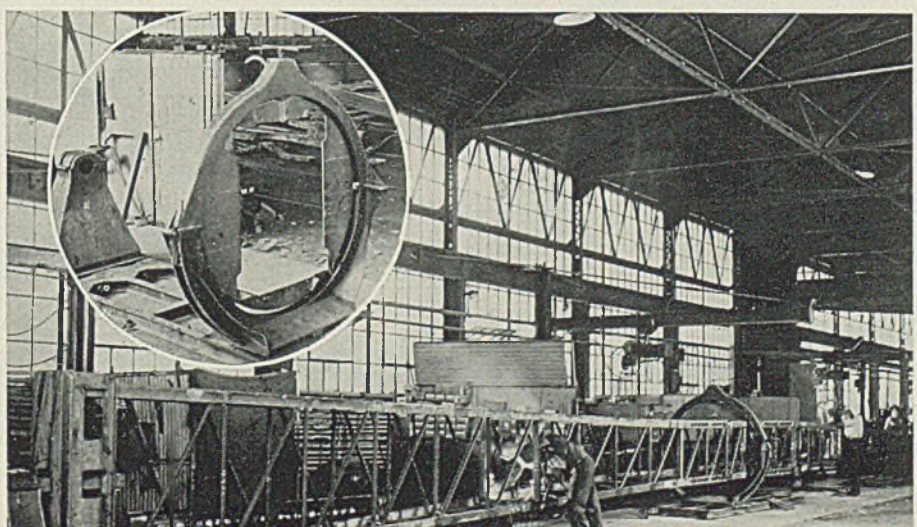
■ AT plant of Osgood Co., Marion, O., it was necessary to develop a means for welding boom structures used in dragline, crane and shovel service ranging in length from 16 up to 85 feet. The length made the ordinary revolving jig impracticable so a special jig was designed using a center section which surrounds the boom structure and permits its rotation. Each end of the boom structure then is clamped into a section carried in a bearing housing, permitting full rotation of the boom. Since the structural framework supporting the jig on the floor is divided into three sections, it is possible to pull the three portions of the jig apart to accommodate the wide range of structure lengths.

Provision is made for locking the rotating bearing caps and closures positively by means of a screw and wheel so the work can be held in any position yet can easily be revolved for downhand welding of all joints.

Welding procedure is as follows: Parts are assembled into a straight line first by tack welding the pipe lacing. Then the various joints are welded, starting from the center and going in both directions from the center portion of the welding jig, revolving the boom to permit all downhand welding in circular movements. No straightening is required of the finished boom.

According to Harry J. Hibbett, general foreman, Structural Forge and Welding Division, Osgood Co., several hundred booms have already been constructed in the jig, all of them meeting completely the requirements for straightness, accuracy and easy welding. In addition, a number of small three-piece structural booms have been built having a removable center section secured by forty ½-inch machined body bolts so the center section can be removed or inserted at will without requiring the use of drifts or reamers.

Continued repetition of accurate construction of this nature is evidence that the revolving jig meets the requirements.



CONSERVATION IS ENCOURAGED

By Disston Control Plan

■ AS IT WAS emphasized strongly in the article "Tooling—Strip It for Action", which appeared in the Jan. 12, 1942 issue of STEEL, conservation of existing metalcutting tools is vitally important in this national emergency. Appreciation of this situation on the part of the tool industry is exemplified by the conservation control plan which has just been launched by Henry Disston & Sons, Inc., Philadelphia.

Recognizing that pressure of wartime production—involving as it does employment of thousands of relatively green hands on difficult metalcutting operations—has led to an unduly high percentage of damage and breakage of scarce and valuable cutting tools including saws and milling cutters, Disston has worked out a campaign to cut down this waste of vital industrial assets. Of this plan, an official of OPM says:

"It reflects precisely what we would have every industrial plant in this country undertake".

Having determined that at a time when supervisory personnel already is spread all too thinly over greatly expanded operating forces, munitions work in many cases demands three times as much supervision as does production of ordinary peacetime products, this plan has been designed first and foremost to ease the pressure on foremen by providing "ready-made" instructions.

Constantly reiterating the slogan, "Conservation Serves Everyone," three angles of attack are being made upon waste of industrial tools and materials. The first is through "conservation control cards". There are 35 different types of cards, identified by numbers, for selective distribution to individual workmen to give them concise instructions in the correct, economical use of the tool or tools with which each one has to deal. Front and reverse sides of one of these cards—that having to do with the use of milling saws—are reproduced herewith. Value of the data set forth is self-evident.

Posters Aid in Campaign

The second line of attack is through a series of posters suitable for bulletin board use in plants engaged in war work. These stress the importance of industrial conservation, and ways and means of attaining it. The third is through promotion of the idea of conservation of vital materials—both by industry and by the public generally—through every possible publicity channel. This includes its teaching in all trade schools in much the same way that it will be carried on in factories.

As its contribution toward nation-wide promotion of the plan, Henry Disston & Sons Inc., stand ready to furnish to industries and vocational schools—without cost—the material which they have prepared. This includes small stickers carrying the slogan; selected sets of conservation control cards such as the one illustrated herewith; and the employe relations posters for bulletin board use.

Demand for Porcelain Enameled Sheets Grows

■ Porcelok Co., subsidiary Davidson Enamel Co., Clyde, O., reports that because of the shortage of zinc great demands are being made on its products corrugated porcelain enameled roofing and siding in construction programs.

These sheets through a special "interlock" provide complete protection for all bolt heads or other fasteners. They are offered in lengths up to 12 feet. Full sheets are 25¾ inches wide and expose 24 inches to the weather. All are cut, beveled, punched and otherwise prefabricated to erection drawings before enameling, eliminating field drilling or cutting. The sheets are being offered in several colors including the latest camouflage effects.

Milling Saws
CIRCULAR—HIGH TEMPER

How to obtain greater efficiency and make saws last longer.

FAILURE	CAUSE	CORRECTION
Premature wear	Operating speed too high for material.	Do not exceed 60 ft. per minute for ferrous materials. See recommendations on other side.
	Feed too light.	Increase feed until chip is normal. See recommendations on other side.
Tooth breakage	Stock slipping or turning.	Inspect clamping device. Use V block to hold rounds.
	Saw slipping on arbor.	Always use key or tug pins. Do not depend upon collars for clamping.
	Saw chatter.	Overhaul gearing to remove backlash.
Blade breakage	Stock slipping or turning.	Clamp stock rigidly.
	Saw slipping on arbor.	Drive with key or tug pins.
	Hanging up in cut due to irregular feed.	Inspect feed mechanism. Overhaul or re-new worn parts.

Correct use of tools . . . makes work easier . . . saves vital materials

Milling Saws
CIRCULAR—HIGH TEMPER
(continued)

RECOMMENDATIONS

Material to be cut	Saw Arbor Above Work		Saw Arbor Below Work		Rim Speed in Feet Per Min.	Feed in Inches Per Min.
	Style Tooth	Hook Angle	Style Tooth	Hook Angle		
STEEL (TOOL & ALLOY)	3	Rad.	3	5°	40-60	1/32-2 1/2
STEEL (TOOL & ALLOY)	2	Rad.	6	5°	40-60	1/32-2 1/2
STEEL (LOW CARBON)	3	Rad.	3	5°	40-60	2-3 1/2
STEEL (LOW CARBON)	2	Rad.	2	10°	40-60	2-3 1/2
CAST IRON	3	Rad.	3	Rad.	50-70	3-5
BRONZE	3	Rad.	3	10°	150-250	10-15
BRASS	3	Rad.	3	15°	300-700	12-20
COPPER	1	5°	1	20°	500-700	10-20
COPPER	3	5°	3	20°	500-700	10-20
ALUMINUM	1	10°	1	25°	800-1000	40-80
MONEL	3	Rad.	3	5°	100-200	2-3 1/2

STYLE 1 — Regular Straight Metal Saw Tooth

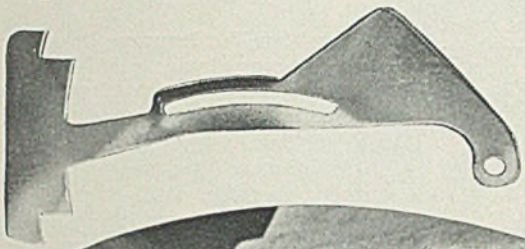
STYLE 2 — Alternate Square and Beveled Metal Saw Tooth

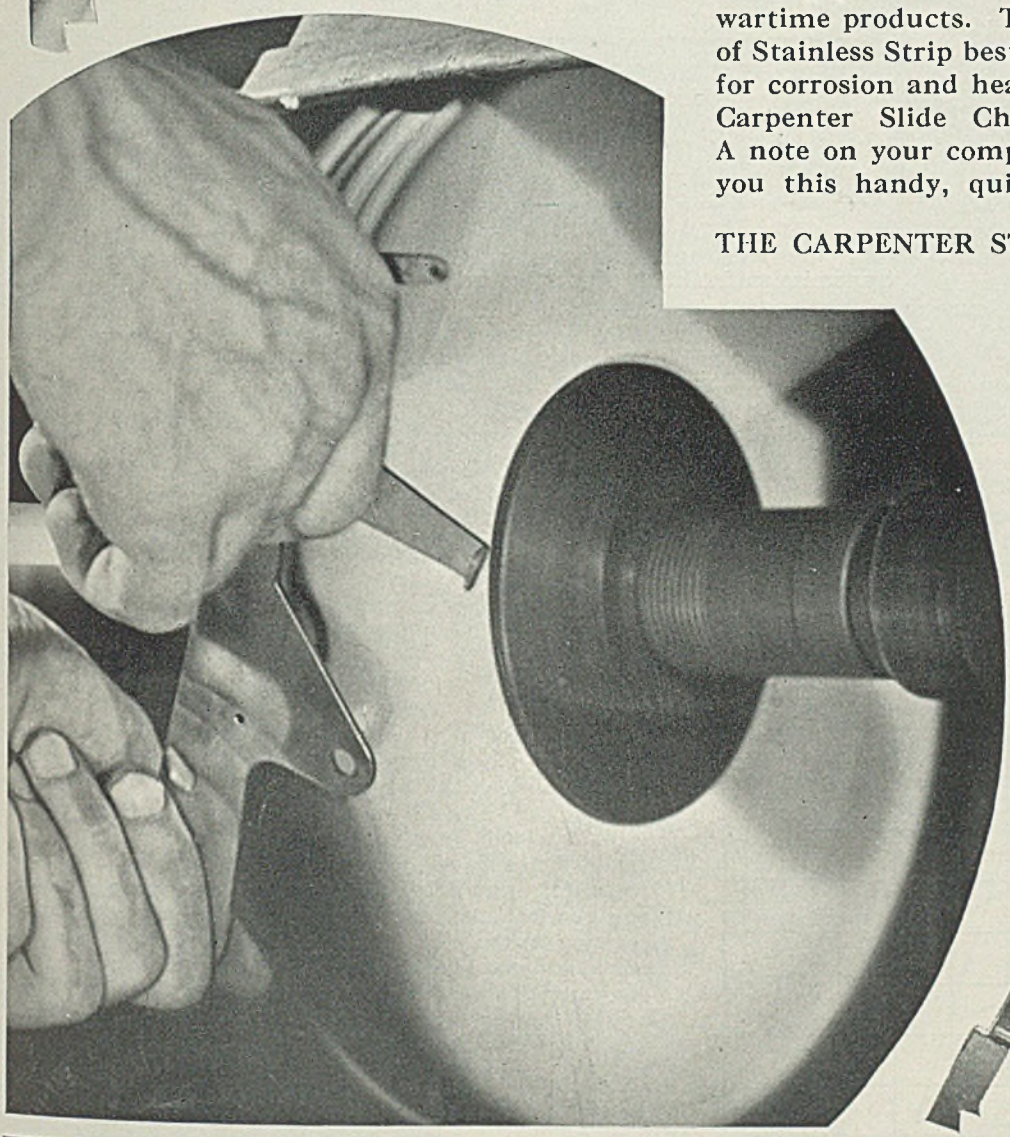
STYLE 3 — Regular Topped Metal Saw Tooth

CONSERVATION · DISSTON · SERVES EVERYONE

This is one of the 35 instruction cards designed for distribution to operatives in plants engaged in war work and defining correct selection and economical use of production metalcutting tools. Growing scarcity of tools plus their present unnecessarily high mortality on munitions work, make this campaign of vital importance in coping with emergency conditions

FOR *Speedier* PRODUCTION OF Stainless PARTS



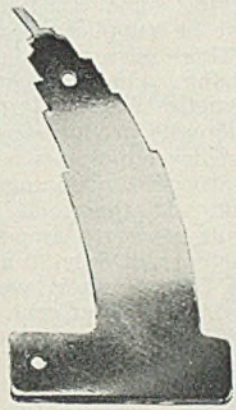


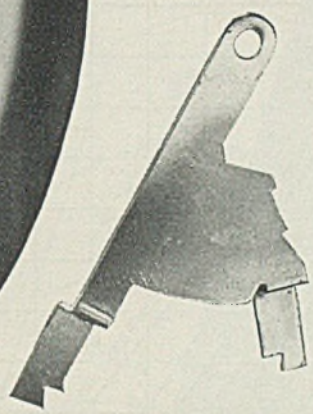
FROM the press room straight through to the finishing department, this Stainless Strip speeds your wartime production.

Intricate shapes and high precision are more readily obtained because of its uniform temper and absence of hard spots. Tool troubles diminish for the same reason. Faster press speeds and steadier output result from its uniform response to press operations. Even buffing time is cut down by the satin-smooth finish that brightens quickly on the buffing wheel.

That's why Carpenter Stainless Strip rates so high among production men. It has helped them out of many tough spots—and is now making possible the faster production of vital wartime products. To find out which analysis of Stainless Strip best meets your requirements for corrosion and heat resistance, send for the Carpenter Slide Chart on Stainless Steels. A note on your company letterhead will bring you this handy, quick-reference Slide Chart.

THE CARPENTER STEEL CO. · Reading, Pa.





Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

POWER-FACTOR IMPROVEMENT

. . . the fastest and most economical way to increase the capacity of the electric power distribution system in your plant

By M. I. ALIMANSKY
And
R. E. INSLEY
General Electric Co.
Schenectady, N. Y.

■ WHAT is power-factor? If we were to ask a group of engineers to give us their definition of power-factor, we probably would receive many different answers. Each person has his own practical conception of power-factor. One of the simplest and easiest to visualize is this one: "Power-factor" is the electrical term used to denote the ratio of useful power current to the total supplied current in a circuit, and can be best explained by two simple examples:

Example I: In an electric circuit supplying a load composed solely of incandescent lights, pressing irons, toasters, water heaters or other equipment containing no electromagnets, 100 per cent of the current supplied is used to produce heat, light, or other beneficial results. This circuit is said to have 100 per cent power-factor.

Example II: However, if the circuit contains magnetic equipment, such as induction motors, transformers, electromagnets, resistance welders etc., some additional current must be supplied to energize these. This current, known as "magnetizing current" produces the magnetic field. Magnetizing current actually produces no useful power but nevertheless is necessary for the proper functioning of the equipment. If the total current in a circuit were 100 amperes and the power current only 70 amperes, then the power-factor would be 70/100 or 0.70 or 70 per cent.

Why Do We Worry About Low Power-Factor? The generation and distribution system which supplies the circuit of Example II must necessarily provide 100 amperes, whereas the actual power current required is only 70 amperes. This means that the electric system must be 100/70 or 143 per cent as large as that of Example I, in order to provide the necessary magnetizing current required in addition to the power current.

Low power-factor then means that the existing generation and transmission facilities of the power companies, and distribution facilities in your own plant may be loaded to capacity, or even overloaded, from the standpoint of actual power being delivered. Since, for the same power delivered, low-power-factor loads impose a greater burden than high-power-factor, power companies have been allowed to introduce into their power contracts kva-demand and power-factor-adjustment clauses which impose an extra charge for low power-factor. Similarly, for industrials generating their own power, power-factor is extremely significant, since the power which can be drawn for production purposes is limited by the amount of generator capacity taken up by magnetizing current.

How Can We Improve Power-Factor? If some device could be found which could be located near the apparatus requiring the magnetizing current, which device were capable of providing this magnetizing current locally, then it would be possible to eliminate the magnetizing current from the generator and feeders, thus releasing system capacity for additional power load. Fortunately, such a device does exist; it is called a "capacitor." It is obtainable in many voltage and current ratings to fit the particular application. When such a capacitor is installed in the electrical system which previously had a low power-factor, the power factor is improved and the system operates more efficiently and inexpensively.

This means you can get more actual power out of your present plant distribution system—in effect increasing its capacity. At the same time you reduce your power costs, cut voltage fluctuations and receive other advantages of high power-factor operation.

Where and How Should Capacitors Be Applied? Means for improving power-factor should be applied at the source of trouble—near the load. Capacitors connected on circuits with low power-factor reduce the current between the point where they are connected and the

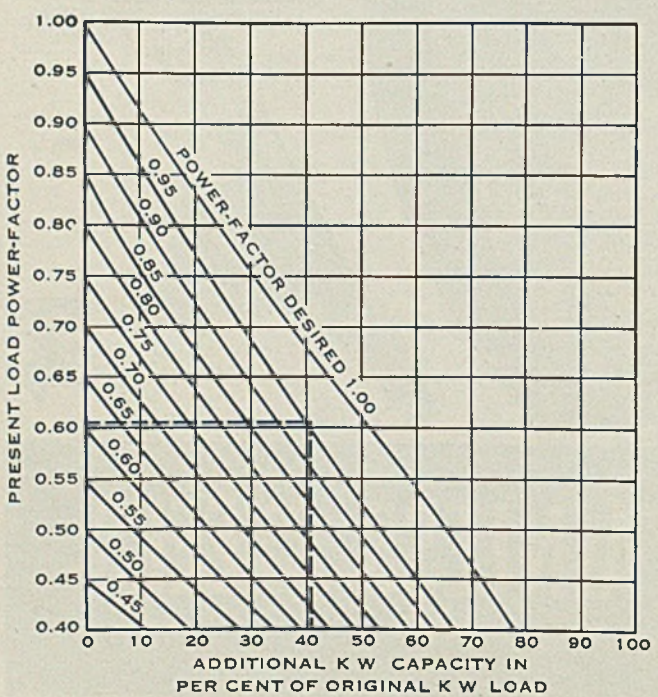


Fig. 1—To estimate gain in load-carrying capacity, draw horizontal line from point at left representing present power-factor. At point where this intersects curve representing desired new power-factor, draw vertical line to chart base and read there the new load your power system can carry after installation of capacitors. Dotted line shows how 60 per cent power-factor of 100-kilovolt-ampere load, when corrected to 95 per cent permits 41 kilovolt-amperes of new load to be handled

TABLE I—Condensed Table Showing How Much New Load Can Be Added After Power-Factor Correction

Original Power-Factor Per Cent	New load that can be added in per cent of present load with power-factor improved to: 90%	95%	100%
60	35.8	41	51.5
65	29	35	44
70	23	28.5	37
75	17	22.5	30

ZINC IN WAR

Loading a gun with 3-inch shells. U. S. Navy photo

BRASS, BRASS AND MORE BRASS

The United States Army and Navy have no satisfactory substitute for brass shells and cartridges. Nor is there any substitute for the high grade zinc used in ordnance brass.

When shell charges are detonated, brass casings heat rapidly to expand and seal the gun breach; then in cooling quickly they shrink to permit easy ejection. It is questionable whether this action can be obtained with any other metal.

From a manufacturing standpoint, it is essential to use 30% of high grade zinc in shell brass to achieve the proper degree of ductility and formability. These properties are necessary to withstand the deep drawing operations employed in forming shell cases in automatic machines.

The fact that one shell of 5-inch diameter requires 18 pounds of brass is impressive. But when the millions of cartridge and shell cases for automatic rifles, machine guns, anti-aircraft and mobile artillery are considered, then the total zinc tonnage required for the Victory Program can be more fully appreciated.

It is this tonnage, plus the war needs for other products normally consuming zinc, which is making it difficult for civilian users to obtain all of the zinc they would like to use.

THE NEW JERSEY ZINC COMPANY

MANUFACTURERS OF THE FAMOUS HORSE HEAD ZINC PRODUCTS

4 BRASS

CERAMICS

DIE CASTING

METAL SPRAYING

GALVANIZING

PHARMACEUTICALS

NICKEL SILVER

1 HULL PLATES

2 RUBBER

3 PAINT

New Jersey zinc

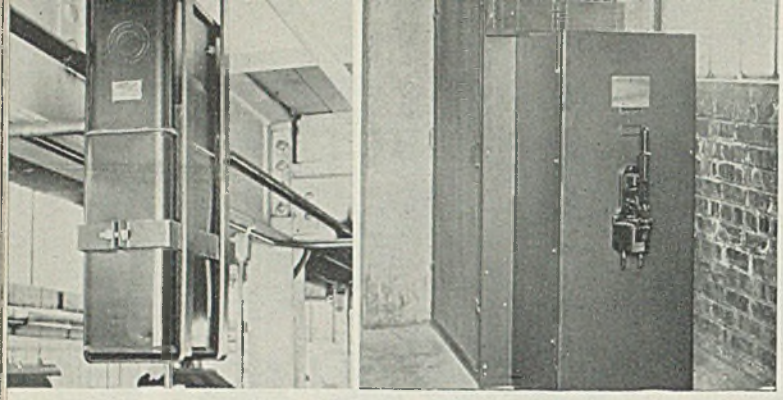


Fig. 2. (Far left) —Typical installation of capacitors mounted overhead

Fig. 3. (Immediate left)—Typical rack-type capacitor installation

source of supply. Therefore, it is imperative that they be installed at or near the terminals of the machine drawing the magnetizing current to obtain most value from their use.

In selecting capacitors, it is possible to work out the optimum value of capacitor rating mathematically, but these calculations are laborious, especially when a number of cases are to be computed. "Short-cut" methods have been devised, as shown in the simplified chart and explanation of its use.

In many industrial plants, existing circuits, transformers, and switching equipment can be made to carry additional power load by the application of capacitors to improve power-factor. This is especially valuable under present conditions, since capacitors are flexible, inexpensive, and obtainable in relatively short time.

This means your lines can be made to carry additional loads, even though they are apparently being loaded to maximum capacity at the present time. Line capacity is rated in current (amperes) that is transmitted. If you eliminate magnetizing current, you have just that much more current-carrying capacity available.

Table 1 is a simplified and condensed tabulation showing how increased capacities up to 51.5 per cent can be made available simply by correction of low load power-factor.

Designs New Assembly

To Prevent

RUNNING STOPPERS

■ RUNNING stoppers in ladles carrying various molten metals have long been an expensive nuisance, and in recent years the swing to larger ladles, the use of hot tops, and the pouring of higher alloy and special steels and at higher temperatures has aggravated the condition.

William Schofield, general superintendent, Sharon Steel Corp., Lowellville, O., and John Bidner, open-hearth superintendent of the same company, report that running stoppers have substantially been eliminated at Sharon Steel Corp. by the use of a stopper rod assembly of the type shown in either Fig. 1 or Fig. 2 drawing. Specifically, the Schofield and Bidner stopper rod assembly includes a metal rod to the lower end of which is removably secured a graphite stopper head by a metal bolt which is held in a recess at the end of the rod by a wedge pin (all standard equipment). Ordinary standard refractory sleeves are threaded on the rod in the usual manner, but the bottom refractory sleeve is replaced by a sleeve having a skirt portion extending down around the stopper head and to a point to substantially surround or even extend below the head of the bolt.

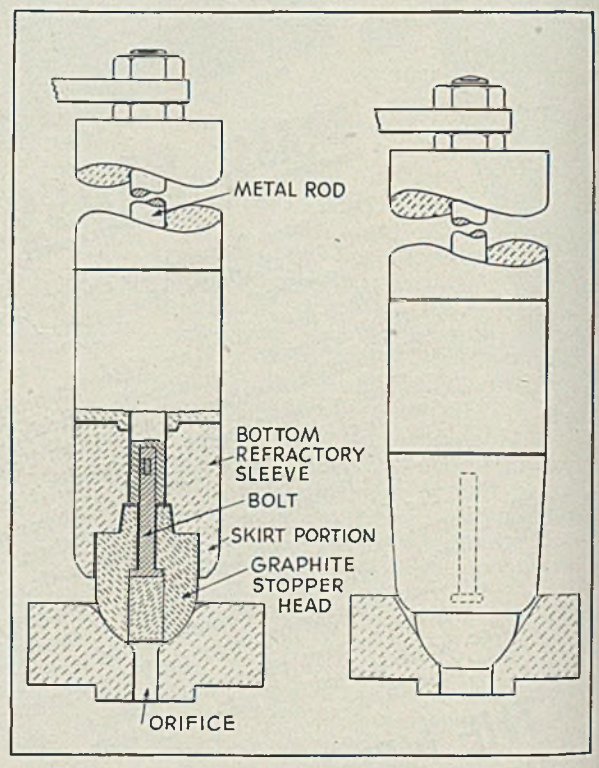


Fig. 1. (Immediate right) — Stopper rod assembly when first placed in the ladle for service

Fig. 2. (Far right)— Stopper rod assembly after the orifice block has been worn away

The improved operation of the stopper rod assembly is thought to be predicated on the fact that the graphite stopper head, while resistant to change of shape under high temperature, possesses relatively high heat conduction characteristics. The refractory clay of the sleeve and the skirt is not as well adapted to resist change of form under high temperature conditions, but possesses a much greater heat insulating action than does the graphite stopper head. Thus, in the use of the stopper rod assembly the skirt extending down around the head to a position below the head of the metal bolt prevents the flow of heat into the metal bolt through the graphite stopper head in metal damaging quantities. Schofield and Bidner found that the failure of the metal bolt in former stopper rod assemblies was the chief cause for the failure of the assembly.

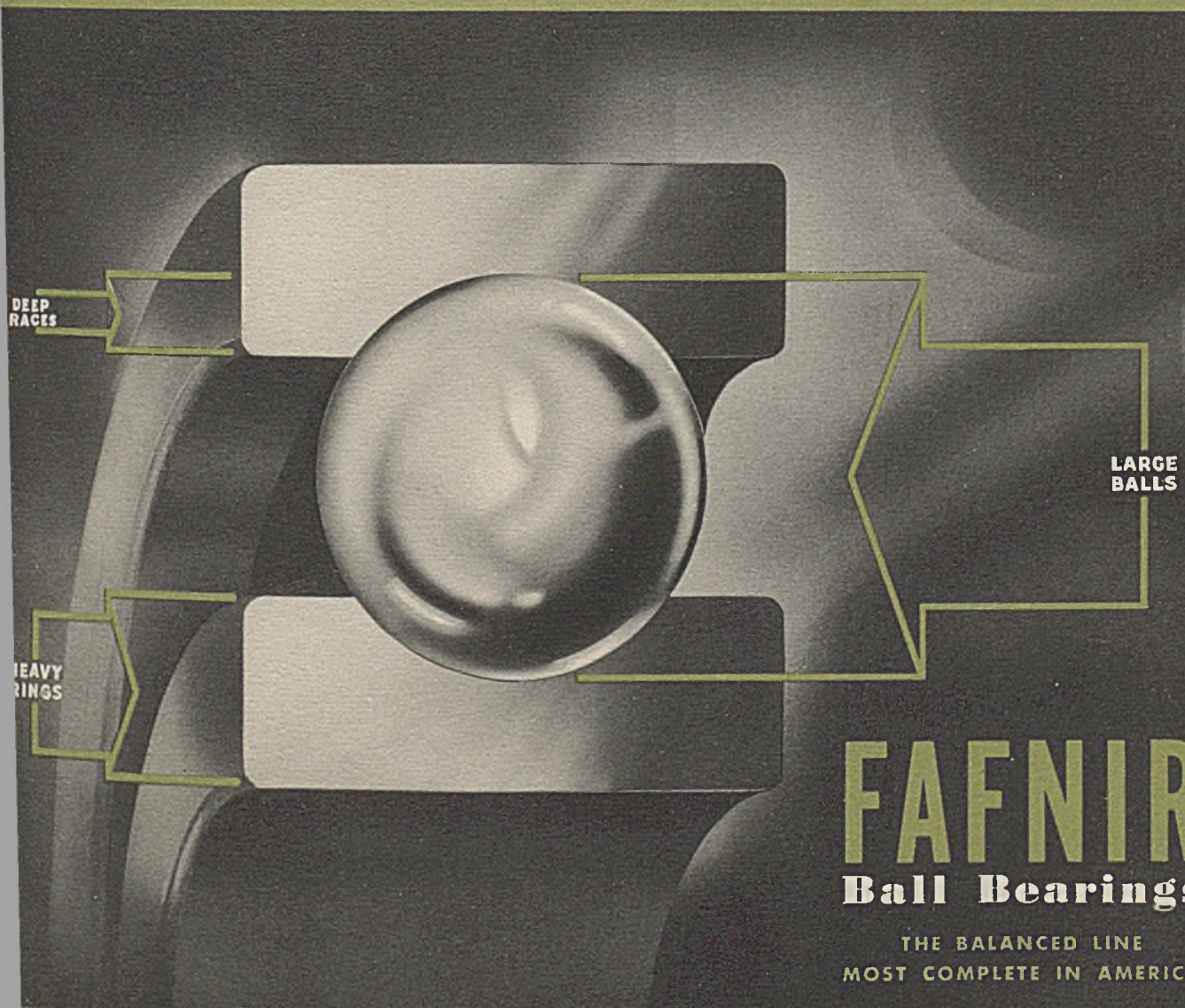
The outer bottom portion of the skirt of the sleeve is preferably chamfered so that the skirt does not strike the orifice block even when the orifice through the block has been worn away in use to the shape shown in Fig. 2. The sides

(*Please turn to Page* 105)

HOW TO LIVE to a ripe old age...

Perfect balance! . . . It's the secret of long life to the aerialist *and the ball bearing*. That is why ball size, race depth and ring thickness were so carefully juggled in the Fafnir Balanced Design, until each was brought to the proper point for maximum performance.

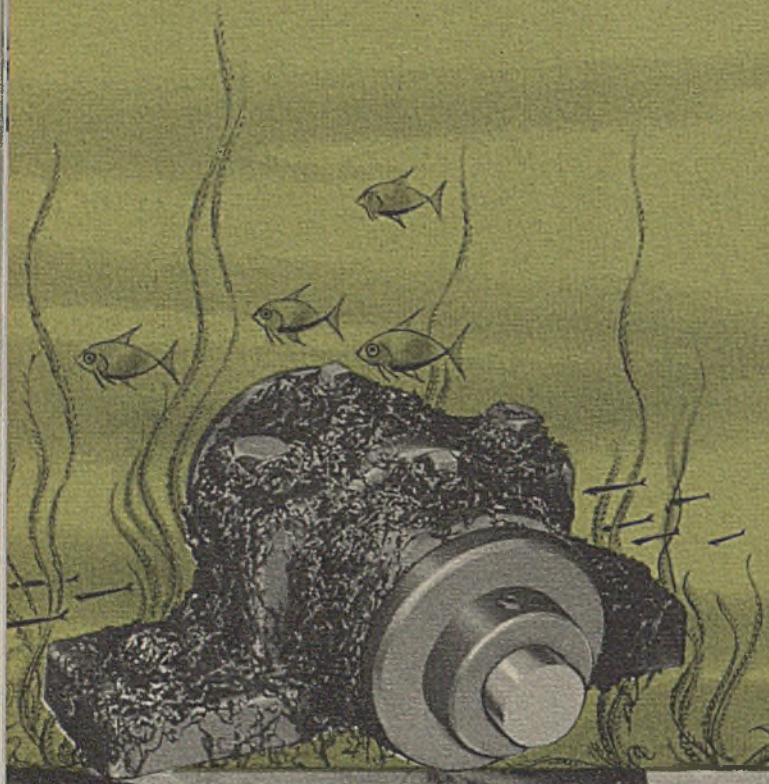
Deeper races; larger balls; ring thickness adequate for strength . . . they're bound to give you greater radial and thrust load capacity . . . assurance that any ball bearing you select from "the balanced line" will perform to a ripe old age. The Fafnir Bearing Company, New Britain, Connecticut.



FAFNIR
Ball Bearings

THE BALANCED LINE
MOST COMPLETE IN AMERICA

TEN YEARS BUCKING THE BOTTOM OF THE SEA



Dried seaweed makes an ideal filler for insulating batts. But when this manufacturer drags it from the Nova Scotian beds, a good deal of sea-bottom comes too. In this plant, sand and shells and stones batter their way through the big picker roll that cleans the dried seaweed for quilting.

How long will ball bearings last on such an application? That's what this manufacturer has been asking himself—*for ten years.* For that's how long the big roll has turned, friction-free and maintenance-free, on Fafnir Heavy Duty Pillow Blocks.

That's good testimony for the load capacity and shock-resistance of the Fafnir Balanced Design, and for the efficiency of the shields and dust-seals with which these hale and hearty old Fafnirs are equipped. The Fafnir Bearing Company, New Britain, Conn.

BEARING UP under all this "bearing down" are two Fafnir DSAODD Heavy Series Pillow Blocks with double seals, recommended for combinations of heavy and extra heavy loads, medium speeds.

FAFNIR

Ball Bearings

THE BALANCED LINE
MOST COMPLETE IN AMERICA

RADIATION PYROMETERS

. . . . provide the burning control needed for better quality in burning porcelain enameling coats upon the ware

By W. A. BARROWS
President
Barrows Enameling Co.
Cincinnati

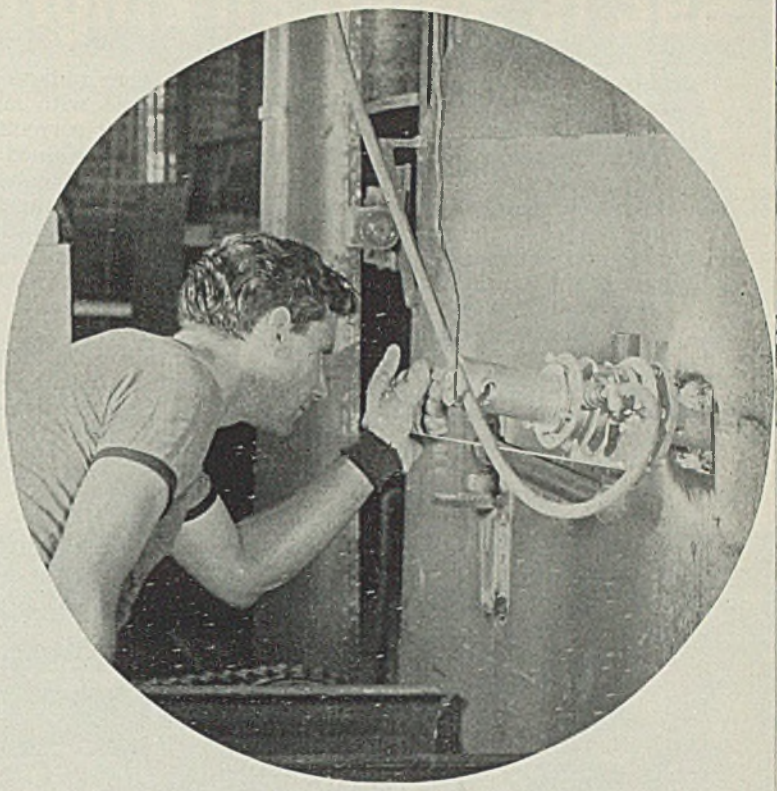


Fig. 1—Closeup of sighting tube containing thermopile of radiation pyrometer, mounted on furnace door. Operator adjusts tube in line with work by sighting along guides as shown here. Batch type furnace is shown

■ THE PAST year has seen many problems in producing porcelain enameled ware multiplied tremendously—due to increased business, the loss of experienced workers and the fast turnover of even our inexperienced help. In general little difficulty is experienced in breaking in brushers, spray hands and most other operators with the exception of the burners. Here an almost insurmountable snag was encountered. Our job shop operations call for short runs of a great variety of ware, and burning requires much more versatility than on production work.

In analyzing burning requirements, allowances must be made for five variable factors—temperature of furnace; gage and shape of ware; weight of tools; temperature of tools and type of enamel. A man on the furnace for a year can make a good stab at these compensations, but a man of a few months' experience is helplessly sunk. Even experienced burners have a bad day or two now and then.

Of all the familiar consequences of bad burning, warping caused the most trouble here. To help with this problem, the American Rolling Mill Co. sent over several men with some interesting laboratory studies on deformation of enameling iron at different temperatures. These reports indicated clearly that the base iron sags slightly at 1450 degrees Fahr. and increases gradually in amount of sag up to 1630 or 1640 degrees Fahr. Above this a critical point is reached where strength is lost at an amazing rate, indicating that if ware were to be produced free of distortion, temperatures should not be above 1650 degrees Fahr. As ordinary enameling practice calls for a furnace temperature around 1580 degrees Fahr. for ground coat, the laboratory test *seemed* to have no particular application to our problem.

Burning Control Important

An Armco study of the time factor on the sagging of iron appeared important. It indicated that at an accurately controlled temperature iron will sag at a fast rate the first few minutes and at a decelerating rate up to 20 minutes and then will continue to sag at a slow rate up through 30, 40, 50 or 60 minutes.

These Armco studies, plus our own shop experience, indicated definitely that accurate control of burning is important. To follow the problem still further, many technical men in the industry were asked two questions: What is the temperature of a properly fired piece of ware? Does firing time affect the maturing of enamel, or is it simply a means of arriving at the proper maturing temperature?

Definite furnace temperatures and definite times were agreed upon, but no one knew what the temperature of the ware would be under these conditions. On the second question, it was unanimously agreed that time and furnace temperature within certain limits had little to do with the matter of proper burning; that the enamel matured at a certain temperature of the ware and that was that.

The obvious solution is to base the burning operation on the temperature of the ware instead of on the temperature of the furnace!

The furnace at the Barrows plant is controlled by the usual recording controlling pyrometer with thermocouple in the rear of the furnace. While this relieves the operators from making furnace adjustments, it does not keep furnace atmospheric temperature at an exact level due to lag, and compensations in burning time have always been necessary.

To test this new theory of burning on ware temperature, a number of test heats were pulled at a predetermined ware temperature, using an optical pyrometer. This proved possible. The temperature of the ware could vary as much as 25 degrees Fahr. plus or minus and work still would be satisfactory. Our best operator previously could not consistently hold within this wide range on the great variety of ware handled in job shop operations. Obviously the answer to correct burning was to obtain a practical instrument to tell the operator when the ware had reached the proper maturing temperature regardless of the five variable factors previously mentioned and regardless of time. Optical pyrometers involved some difficulties on this work so a radiation type instrument was selected.

The radiation type pyrometer em-

From a paper delivered at the sixth annual forum of the Porcelain Enamel Institute at Ohio State university, Columbus, O., Oct. 10, 1941.

ploys a lens to concentrate the heat rays onto a group of small thermocouples connected in series (to increase the electric energy to a measurable amount). The current generated by this group of thermocouples (called a thermopile) is measured and translated into degrees in a standard pyrometer. For use on a porcelain enamel furnace, the instrument must meet the following rather unusual list of requirements:

—Radiation head must be located in the furnace door to avoid remodeling the furnace.

—Head must be compact so as not to interfere with hanging rack tools or loading the fork.

—Tube must not extend into the furnace more than the thickness of the door.

—Head must withstand normal vibration of moving and seating of the door.

—Head must withstand relatively high surrounding temperatures, and these temperatures must not affect its accuracy.

—Head must be mounted on a swivel so that it can readily be focussed on ware in various parts of the furnace.

—Focusing beam must be confined to a spread of but a few inches at 6 to 8 feet so it can be trained on a small size piece.

—The radiation head must be equipped with sighting devices for aiming it correctly. False readings result if trained on furnace walls or burning tools.

—Temperature must not be affected by objects outside of the focus area such as furnace walls.

—The pyrometer must actuate a signaling device.

—The control setting must be quickly adjustable by the operator without opening the instrument.

—Cost must be reasonable.

The Brown Instrument Co.'s "Radiamatic" appears to meet these specifications satisfactorily so was used here. Results have been extremely gratifying. It was expected that several days would be required in checking and switching over from the old time-temperature method. However, after the first check on each type of ware, the cover coat, ground coat and a few special enamels, our time clock has not been touched. And what is more important, not one load of improperly fired ware has been encountered since the change.

The pyrometer is marked with the following table:

Ground Coat, 1630 degrees.
Zirconium White, 1575 degrees.
Colors and black, 1550 degrees.

The operators simply set the pyrometer at the proper temperature, run the load into the furnace, walk to the radiation head on the furnace door and aim at any convenient piece of ware. Atmospheric temperatures are not considered unless some delay has caused the furnace to get completely out of the usual burning ranges. When the alarm bell rings the ware is done—without question.

The operators no longer consider the time factor in pulling heats. But this does not mean that time can be entirely ignored, or that ware can be fired in an amazingly short time to step up production. We assume that time must be held within the usual range in order to have uniform absorption of heat in the ware and to allow for proper oxidation of the iron in burning the ground coat. A control procedure has been set up to check burning periods several times a day to be sure that they are within reasonable limits. These limits are controlled by proper adjustment of atmospheric temperatures through our automatic furnace control, which, of course, has been retained.

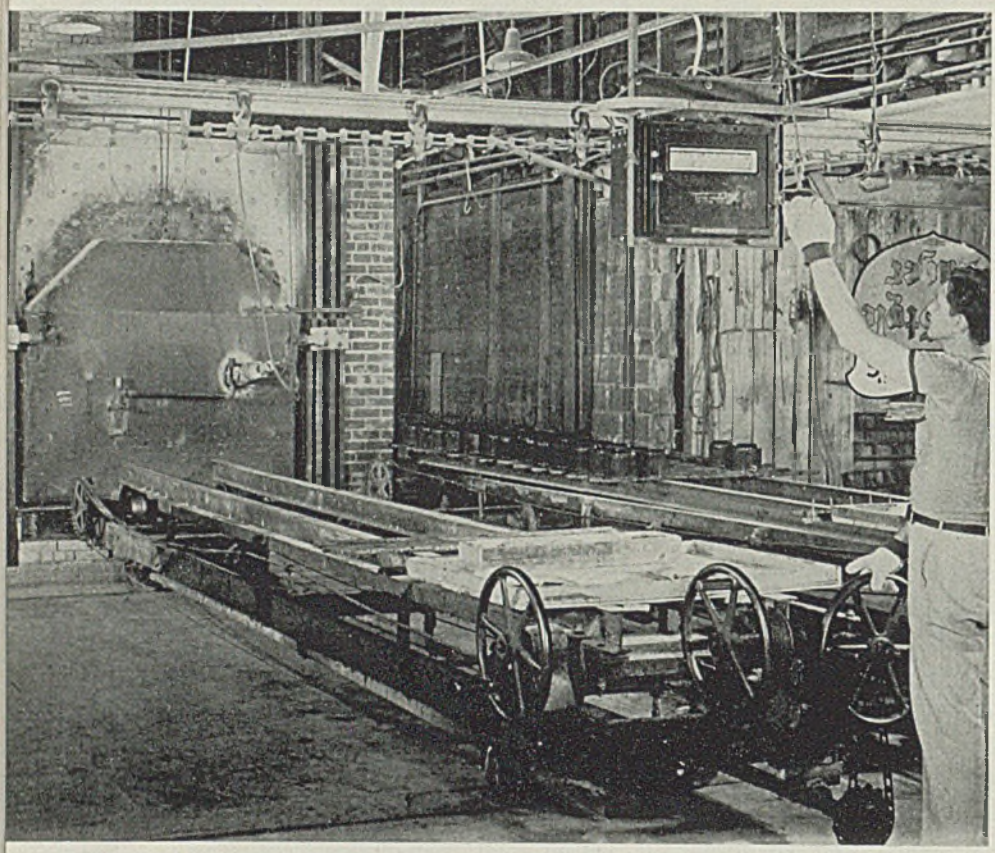


Fig. 2—Operator watches indicating instrument of radiation pyrometer and pulls ware from furnace when thermopile sighted on work shows that the ware has reached proper burning temperature

Better Product Produced

As to the effects of this procedure on quality, all distortion of metal appears to be eliminated except that caused by fabrication or design of the part. Since oxide manufacturers feel that practically all variations in color are due to temperature variations, the major part of their troubles appears to be eliminated. Also ground coats can be more closely adjusted to the metal and to the individual shop conditions through closer control of burning.

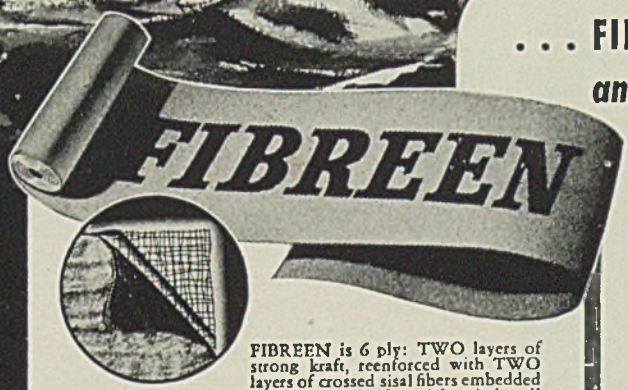
While practically no cast iron work is done in this shop, it seems probable that this new type of burning control may be found even more useful there than on sheet ware. While particularly suitable for handling a wide variety of job shop ware in box furnaces, the instrument surely can be applied to continuous furnaces also. Here the radiation head could be focused on the passing ware and the furnace temperature controlled directly from the ware.

The labor problem is licked. Whereas a few weeks ago but one man outside of the supervisor could handle the burning, now at least five men are competent to burn the ware properly using the new system.

The reaction of the workmen may vary, but the furnace operators here were highly pleased with the new instrument. They no longer worry continually as to whether they are guessing right. They do not pull heats out too soon for fear of overfiring and then run them back in for additional fire, with loss of time and greater chance of misjudgment

When U. S. Production Fights Its Battle at Sea

. . . FIBREEN protects the materials of war . . . *on deck and below* . . . against the hazards of transportation



FIBREEN is 6 ply: TWO layers of strong kraft, reenforced with TWO layers of crossed sisal fibers embedded in TWO layers of special asphalt—all combined under heat and pressure. FIBREEN is pliable and clean—will not scuff—stands an astonishing amount of abuse and exposure. Used either as a wrapping or lining material.

Soak it—twist it—try to tear it.

Only when you get a sample in your own hands can you realize that a *paper* can be so strong—so tough—and impervious to moisture. There is no other material like FIBREEN. In rolls and blankets of many widths.

A product of The Sisalkraft Co.—manufacturers of Sisalkraft, Sisal-X, Sisal-Tape and Copper-Armored Sisalkraft.

Long before shipments of war materials reach the front, they face the destructive onslaught of rain, waves, flying salt spray—possibly a dry, scorching sun—or snow and piercing cold. Protection against these hazards of transit is as necessary as armed protection against enemy submarines or bombers.

This protection must be made at the factory *in the shipping room*—and FIBREEN is recognized as one of the most effective, practical materials that can be used for protective packing. It is used as a liner for cases or as a tough, weatherproof wrapping. FIBREEN meets the most severe specifications and inspections. It's pliable, clean, inexpensive, is absolutely waterproof—amazingly strong, tough and durable.

Because of these qualities—and because of the vital importance of properly protecting the vast stores of war materials that pour from American production lines—finished goods, materials and supplies; as well as machines, tools or parts shipped from one plant to another—FIBREEN is now being allotted entirely to uses essential to the nation's war program.

Inquiry is invited from those industries that are in the "essential" classifications. Write, stating what you ship and how you now pack it.

THE SISALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO, ILL.
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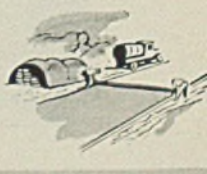


SERVING INDUSTRY . . . . . CONSTRUCTION AND AGRICULTURE THROUGHOUT THE WORLD

in the double fire operation. An increase in production is already apparent.

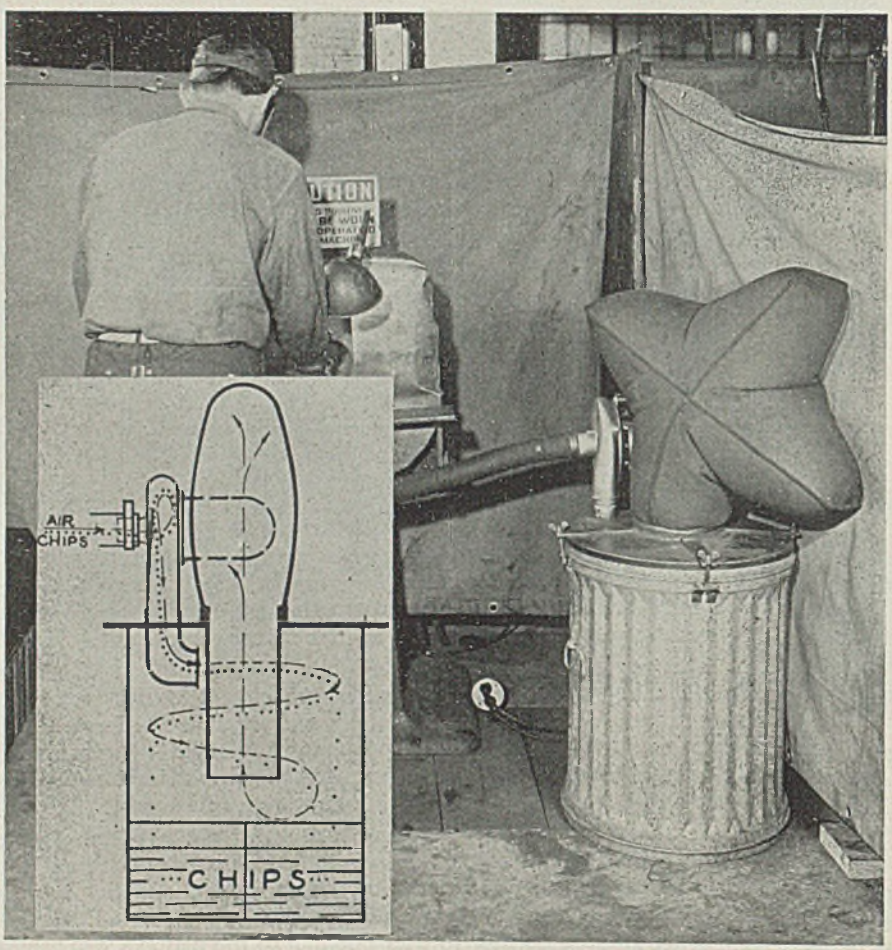
A step up in burning quality tends to increase the quality of other operations, also. Usually operators working with good ware try harder to make their own operations good. Rejects and reoperations are reduced. Whereas day and night floor foremen used to spend as much as 75 per cent of their time in checking burning operations, this time now is nearly reduced to zero.

Getting back to the technical point of view, recall that the Armco tests showed iron distorts rapidly at 1640 degrees Fahr. and over. While the furnace is still controlled to an atmospheric temperature of 1580 degrees Fahr. for ground coat, the ware is fired at 1630 degrees Fahr., according to the radiation pyrometer. The ware obviously absorbs heat at a different rate and degree than the conventional thermocouple. Also, the thermocouple, being located in the colder back wall of the furnace, may not indicate true heat.

Radiated heat from the side walls and floor of the furnace appears to be the prime source of heat in the ware, with atmospheric heat a secondary source. A logical step then would be to control accurately the furnace wall temperature rather than the atmosphere. This can be done by mounting a second radiation head in the rear wall of the furnace focusing on the side walls and controlling the furnace burners from this instrument.

Considering that the ware actually does reach 1630 degrees Fahr., the importance of the Armco reports on sagging becomes evident. It now is possible to see the rate at which heat is being transferred to the ware by watching the indicator jump 10 to 15 degrees every second. When we see how dangerously close to the critical temperature of the iron we approach, and how short a time it would take to overfire the ware badly, we marvel that we ever were fortunate enough to have burned a piece correctly under the old time and furnace temperature control method.

A Simple Dust Collector



■ This simple dust collector, in the familiar form of a galvanized waste can, needs emptying only about once a month. It holds 75 pounds of chips and grit and is used in conjunction with a grinder employed for rough grinding of castings in the plant of Reliance Electric & Engineering Co., Cleveland. A blower, driven by a 1-horsepower motor, sucks dust at high velocity through a short length of hose into the can, the particles falling into a separating baffle at the bottom. The latter consists simply of two pieces of sheet iron set on edge and at right angles. It serves to stop the spiraling effect of the dust as it nears the bottom of the container, and eliminates possibility of subsequent turbulence. A couple of vigorous shakes of the fabric bag after the blower is stopped insures a clear air passage for further use.

Offers Seven Shades of Camouflage Paint

■ A new type low visibility paint for use in the protective concealment of vital defense structures and equipment is announced by Arco Co., 7301 Bessemer avenue, Cleveland.

Featuring exceptional heat deflecting qualities, the paint is being offered in seven shades that are difficult to see from aircraft. The unusual degree of heat deflection which can be obtained with the darker colors is said to be of particular value to public utilities, oil producers and refineries, and to anyone storing large quantities of volatile materials in tankage above ground.

Why British Unions War Against Dictators

■ *Trade Unions Fight — For What?*, by Herbert Tracey; fabrikoid, 222 pages, 4¾ x 7¼ inches; published by Chemical Publishing Co. Inc., Brooklyn, N. Y., for $2.

The subject matter of this book is concerned with the machinery of consultation by which trade unions in Great Britain have co-operated with the government and organized employers in setting up control and management of industry during the war and for guidance of social policy under war conditions. Regulation of labor, conservation of manpower resources, arms and war material production and control of food and fuel supplies are covered.

Discussion of the implications of the important and novel decision of policy moves from the solid ground of fact. An introductory section offers a trade union explanation of the war as a conflict of social forces working for freedom with forces which are striving to reduce the people once more to slavery. Their changed attitude is explained as their response to the attempt of the Nazi-Fascist dictatorship to destroy the foundations of working class freedom.

The discussion shows in what direction trade unions are moving.

WHEELS MUST BE KEPT TURNING FOR VICTORY

In your own "all-out" effort to meet the pressing problems of design and production you are invited to make use of any small part the Jones organization might be able to play in helping you to keep the wheels turning for victory.

Our Bulletin No. 80 "Jones Drives for Industry" may be helpful to you in giving you a complete picture of the Jones products, engineering services and manufacturing facilities that are available. Your request will bring a copy.

W. A. JONES FOUNDRY & MACHINE CO., 4437 Roosevelt Road, Chicago, Ill.

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CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION
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In the Vanguard to Victory

● Van Dorn is all-out for Victory. We've geared up for this war since 1939. We enlisted early. Production here has been on a war basis for months.

The great Van Dorn metal working plant has fit perfectly into Government war production plans. We have arms manufacturing experience from World War 1. For 64 years, we have been recognized masters of metal fabrication. Welding — backbone of speed and strength in armament building— is a Van Dorn specialty. Heat treating and machining are others. Our facilities are among the most modern and complete in industry. *Now, they're all going full speed ahead to Victory.*

Although all our production effort is concentrated on war work, our large, specialized staff of 45 metal-working engineers and designers are free to serve you in developing plans for a more favorable future for your product in post-war selling days.

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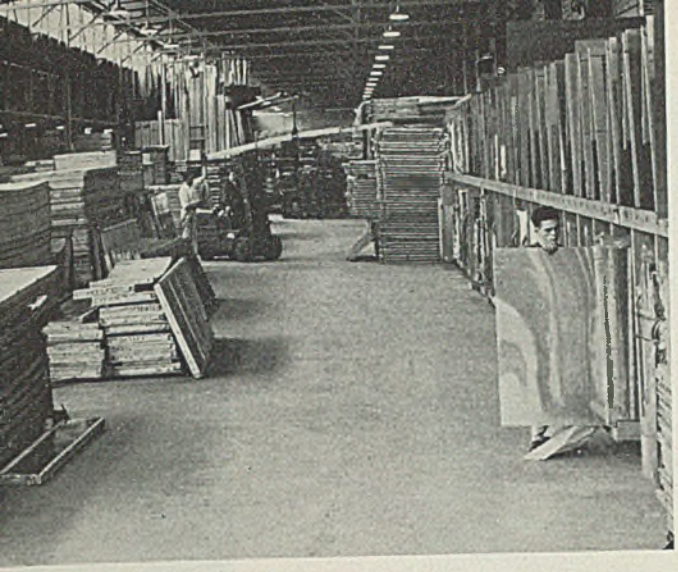


"FLYING FORTRESS"

. . . . production speeded by materials handling equipment in new plants. Departmental layout planned for minimum length of handling movements

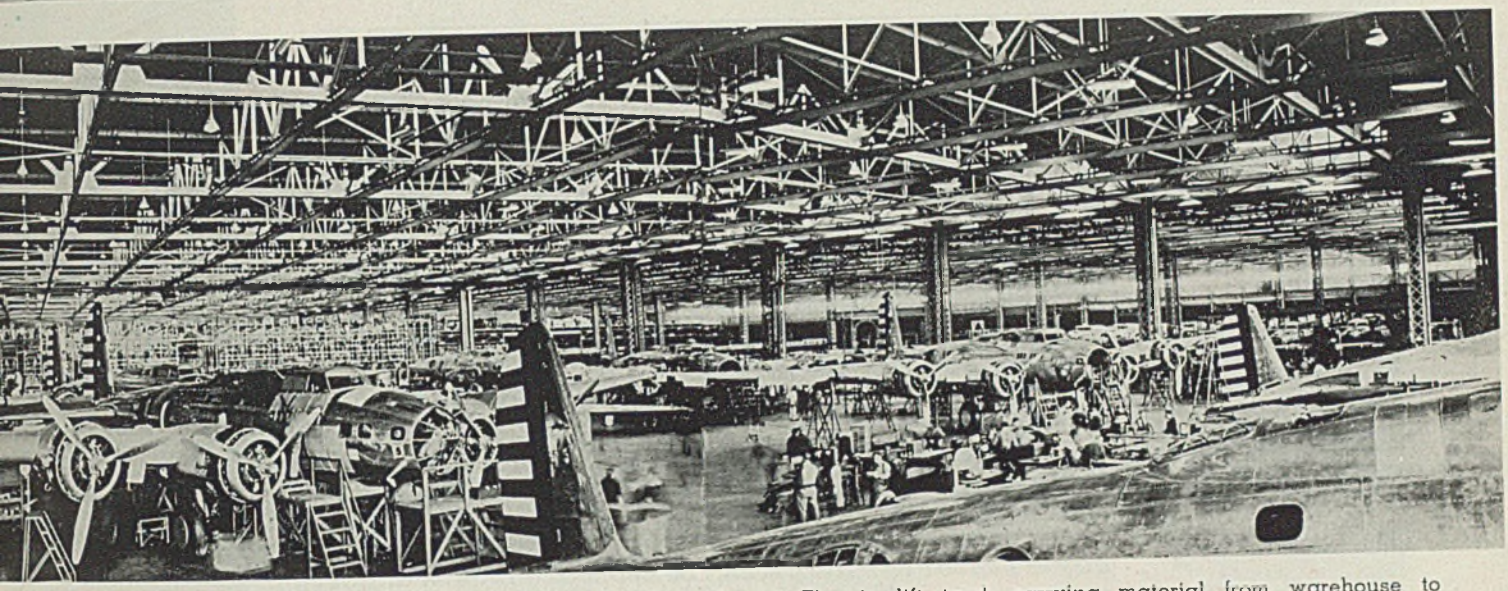


Fig. 1. (Left above)—Electric lift truck carrying material from warehouse to production areas

Fig. 2. (Immediately above)—Looking across the smaller of two wide-span final assembly bays at Boeing's plant No. 2 in Seattle. Note maze of overhead monorails over which monorail bridges move to serve every portion of huge assembly area of the plant

■ IN THE huge 41-acre bomber plant of the Boeing Aircraft Co. at Seattle, mechanical materials handling equipment is playing an important part in the production of the famous Flying Fortresses.

The latest version of the Flying Fortresses is known as B-17E. It is approximately 5 feet longer and has greater gross weight and greater fire power than earlier designs. The B-17C, an earlier version, known in Great Britain as "Fortress I" is the type that opened a new phase in aerial warfare when it introduced extremely high altitude bombing in Europe, flying at such high altitudes as to be virtually beyond the range of sight or sound of hostile ground crews.

The B-17E Flying Fortress features power turrets both on the top and bottom of the fuselage and a stinger turret in the tail to provide resistance to attack from any direction. It has enlarged horizontal and vertical tail surfaces, similar in appearance to those of the Boeing Stratoliner, that provide for the increased size and weight. The B-17E also continues the exceptional streamlining that has characterized the earlier Flying Fortress series.

Quantity production of this bigger and more deadly Flying Fortress is being rushed by a recently arranged Boeing-Douglas-Vega joint production "pool". In this unique co-operative arrangement, provision is made for manufacturing completely assembled identical planes at the new Long Beach plant of Douglas Aircraft Co. and the Burbank plant of Vega Airplane (a subsidiary of Lockheed Aircraft Corp.) as well as at the Boeing plants including the new Boeing bomber plant at Wichita, Kans., a recent

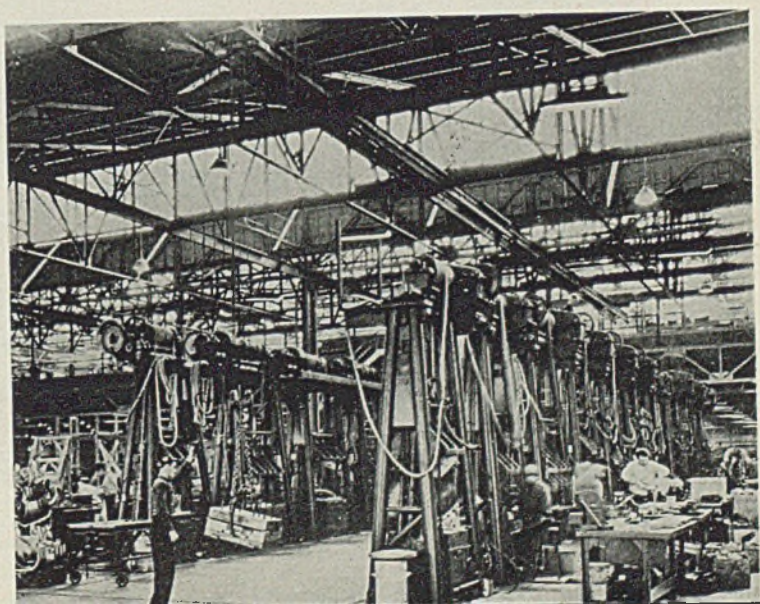


Fig. 3 — Dies cast in foundry located at head of these two drop hammer lines are carried direct to hammers by overhead monorail lines and electric hoists

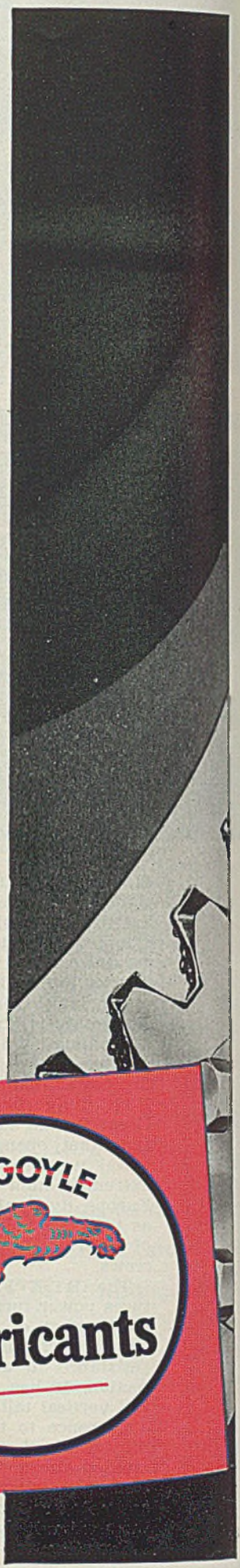
Painting a "Cushion" on Open Gears

THE "CORRECT" ANSWER TO AN IMPORTANT PROBLEM IN VITAL DEFENSE PRODUCTION

Problem: The open gears at the right must be protected by a lubricant against wear due to: (1) Heavy or shock loads, (2) Dust and dirt in the air, (3) Presence of water.

The *correct* lubricant for this job must provide: (1) A tough film to prevent metal-to-metal contact, (2) A thin film to prevent accumulation of abrasives and packing of clearances, (3) A tough "waterproof" coating.

Answer: We have created a unique lubricant for this job — *Gargoyle Viscolite Fluid.* It can be applied by hand without heating, or be fed by mechanical devices. It is made with a quick-drying, non-inflammable diluent. As the diluent evaporates, a tough, black, thin skin is formed. *This film won't squeeze out or throw off!* As the film is thin, there is no opportunity to hold or pack dirt and dust. The tough coating sheds water like a duck. In many cases, Gargoyle Viscolite Fluid has helped reduce consumption more than 50%. This lubricant is available in four viscosities to fit every set of operating conditions.



TO HELP MAINTAIN CAPACITY PRODUCTION, CALL IN

SOCONY-VACUUM for "Correct Lubrication"

GARGOYLE Lubricants

SOCONY-VACUUM OIL CO., INC. — Standard Oil of N. Y. Div. — White Star Div. Lubrite Div. — Chicago Div. — White Eagle Div. — Wadhams Div. — Southeastern Div. (Baltimore) — Magnolia Petroleum Company — General Petroleum Corporation of Calif.


GARGOYLE VISCOLITE FLUID IS APPLIED IN LIQUID FORM. NO PRE-HEATING IS NECESSARY.
THIS UNIQUE LUBRICANT DRIES QUICKLY – LEAVING A TOUGH, BLACK SKIN TO CUSHION SHOCK LOADS.

Fig. 4—Monorail bridges also serve final assembly area in new 300-foot bay at Boeing plant No. 2. Note how small men appear working on plane in extreme right, rear, just to right of pillar

expansion of which will make it almost match in size the enormous Seattle development.

The scope of this bomber building setup in which hundreds of aircraft part and equipment manufacturers and subcontractors are cooperating is indicated by the enlarged Seattle plant of Boeing where the Austin Co., Cleveland, completed 660,000 square feet of building area in 90 days in the summer of 1939 and another 1,000,000 square feet of production area in a subsequent 140-day period during the fall and winter of 1939. This plant has recently been further expanded to an active floor area of 2,400,000 square feet. The new Wichita plant, originally 380,000 square feet, has an enlargement being completed which will make available 1,700,000 square feet.

In the expanded Seattle plant alone, Boeing has installed during the past year more than $9,000,000 worth of the most modern production machinery obtainable as well as assembly jigs, dies, machine fixtures and handling equipment for quantity production. The tooling department has designed and manufactured in this same period some 40,000 jigs and tools to speed volume production.

Literally millions of parts and subassemblies for the B-17E's are now being produced at an unprecedented rate. More than 55 different subcontractors are building special parts and subassemblies, and 193 other contractors are furnishing standard parts and equipment for this production line.

At the Seattle plant, production flows 1000 feet forward from the Duwamish waterway, between two parallel warehouses, from which parts and material are distributed to all portions of the plant with a minimum of travel. Wide distribution aisles flank these warehouses on either side of the manufacturing area to expedite handling of materials, which is done using a highly integrated system of gasoline, electric and hand trucks, designed to provide a minimum of cross traffic.

Sheets, heavy tubing and bar stock of stainless steel, aluminum alloy and other aircraft metals are stored in the north warehouse and find their way to the nearby basic primary shop where shears, brakes, hydraulic presses, drop hammers and nonferrous heat treating furnaces are located; or to machine shop or welding department where other operations are concentrated. Materials in process follow several direct routes from these points through special isolated heat-treating, plating and painting departments in ventilated rooms along the production line toward the wide final assembly bays which extend across the 750-foot front of this plant.

A second story, provided above the machine shops and extending back to the extreme rear in the area just completed, accommodates the tubing shop, electric shop and the wide variety of subassembly operations required to prepare for final assembly of the planes.

A thick concrete firewall roughly divides the main plant into two halves, separating the primary and subassembly shops in the rear from the 375,000-square-foot final-assembly area toward the front. A 2-story part storage area runs along this firewall its entire 750-foot length overlooking all final assembly operations. At the front of the building, four telescoping hangar doors, the largest of which is 295 feet wide, have been installed across the full width of the plant to facilitate moving completed planes out upon the apron connecting to the adjoining airport.

As will be seen in the accompanying illustrations, provision is made for monorail bridge cranes to operate over the entire assembly area. These units are employed to handle everything from fabricated parts and subassemblies to the huge wings and fuselages. These mechanical handling devices aid at every step as the work progresses from storage balconies through jigs to the final positions where bombers are finished and engines are mounted in place.

This Seattle plant is also building twin-engine DB-7 bombers for the British and is furnishing all blueprints and master templets for use by Douglas, Vega and the Boeing plant in Wichita in connection with the "pool" program for making the 4-engine B-17E Flying Fortress. Included in the Seattle plant's 41-acre interconnecting layout are a model 4-story engineering building with 182,000 square feet, a 3-story reinforced concrete office building having 47,000 square feet,

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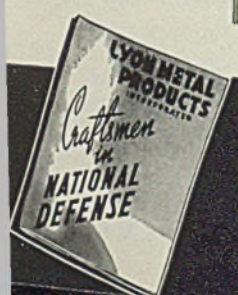

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a large boiler house, a 2-story personnel building, a new camouflage-paint building and miscellaneous service structures. More than 42,000 square feet of floor space is provided underground for plant washrooms, locker rooms and service facilities, with another 54,000 square feet of underground space providing more than a mile of access tunnels through which employes travel from plant entrances directly to their own departments, thus eliminating the confusion caused by large numbers of men moving about in the production areas as shifts are changed.

The Seattle facilities are being practically duplicated at Wichita, the main difference being the provision of two assembly bays with 300-foot clear spans in addition to one of 200 feet already in use. This compares with one 300-foot, one 200-foot and two 125-foot bays at Seattle.

In planning the layout at Seattle, great care was taken to provide all facilities needed so that a minimum amount of backtracking would result in handling of subassemblies and materials in process. For instance, a steel heat-treating department is located directly adjacent to the machine shop for maximum convenience in handling parts in process.

Another example of layout to facilitate handling of materials is seen in the flow of material from the warehouse to a large power shears in a production area immediately adjoining and onto a battery of punch presses and drills for further preparing the work. Immediately adjoining this area is the drop hammer and the hydraulic press department for forming the pieces of sheet metal. Such an arrangement simplifies the flow of material, helps prevent bottlenecks and so facilitates production.

Fig. 2 was taken looking across the smaller of two wide-span final assembly bays at the Boeing Aircraft Co.'s plant No. 2 in Seattle. Here are seen Flying Fortresses approaching completion. Taken from a point just inside the 195-foot canopy hangar door which opens upon the apron where planes await trial flight, this illustration was made before the new 300 x 500-foot assembly bay had been occupied. It shows the accumulation of fuselages awaiting final assembly in the right background.

Cranes Facilitate Handling

Note that monorail bridge cranes are provided to serve this entire area and the two 125-foot bays immediately beyond it. They facilitate the handling of parts from a second-floor balcony, a part of which can be seen from the center background, and from the big wing jigs seen in the left background behind the bombers.

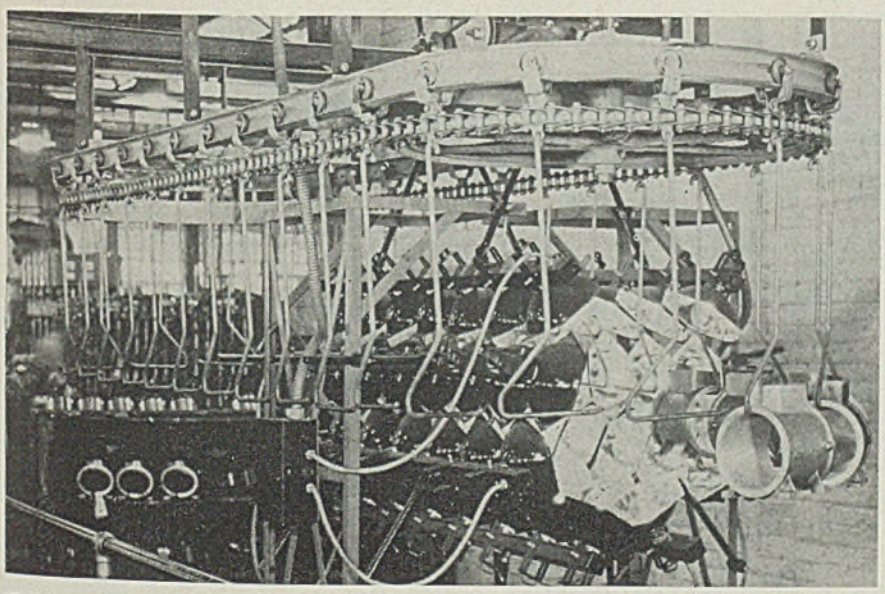
Fluorescent fixtures and Mazda lamps are alternated throughout this area and provide a minimum of 20 foot-candles of light on the working plane. In many of the processing departments, fluorescents are relied upon to provide 30 foot-candles or more of illumination.

In Fig. 4 also can be seen the multiple overhead monorail lines from which the bridges are suspended to permit the overhead monorail crane system to cover every portion of the huge assembly bays. This view is taken in the new 300-foot bay recently erected at the Boeing plant No. 2 in Seattle. The huge size of these aircraft can be appreciated only by comparing them with the size of the workmen seen standing on the platform working on the plane at the extreme right in the background. Look just to right of pillar.

In Fig. 1 is shown one of the electric lift trucks used to transport materials from the warehouse to the basic primary shops which adjoin the north distribution aisle located on the other side of the hollow tile wall seen in this view at the right. Huge quantities of sheet aluminum and other aircraft metals are stored in this 108,000-square-foot north warehouse at Boeing Seattle plant No. 2, a portion of which is shown here.

Another example of short cutting the handling of materials is seen in Fig. 3 where dies for the drop hammers are cast in the foundry located immediately adjoining the head of the two drop-hammer lines. Dies are transferred from the foundry to the drop-hammer lines by means of overhead monorail lines. The operator in Fig. 3 is moving a die down to one of the drop hammers. Obviously the short distance and easy movement afforded by the monorail equipment between foundry, drop-hammer line and die storage greatly speeds the movement of dies and so increases production in the drop hammer department.

Rejects Reduced by Shrinkage Fit



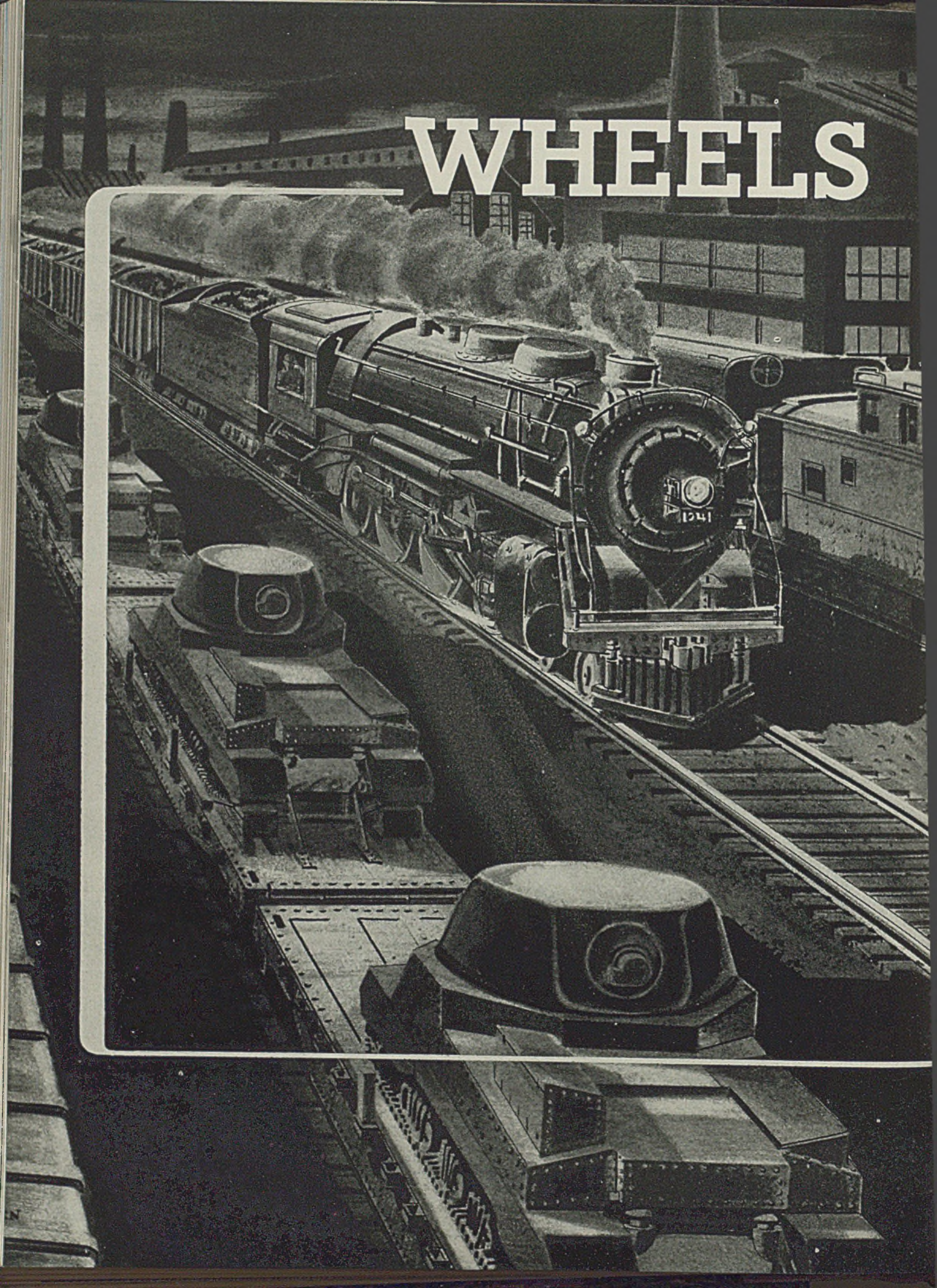
■ Infrared heating for shrinkage fit reduces rejects frequent with press fitting of aluminum and steel at the Westinghouse small motor plant at Lima, O. Traveling at the rate of 30 feet per minute, a rotary conveyor carries aluminum frames having a 6¾-inch bore through a tunnel formed by a battery of fifty-six 375-watt lamps. Heated to 150 degrees Cent., the bore expands 0.020-inch, enough to allow the wound primary to drop in place

Approval of Practice Eliminates 275 Items

■ Revision of the recommendation on eaves trough, conductor pipe, and ridge rolls recently approved by the industry will be effective from Feb. 1, 1942, according to the division of simplified practice, National Bureau of Standards, Washington. It is estimated by the standing committee that this action will eliminate more than 275 items.

The current revision identified as R29-42, eliminates double bead eaves trough in the 4, 5, 6 and 7-inch sizes, together with all accessories, such as miters, end pieces, hangers, etc., in all grades of materials and gages.

Until printed copies are available, free mimeographed copies of the recommendation may be obtained from Washington.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  We'll fight 'em here in the pits and ditches;
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  We'll show 'em what America is."

- Each man to the job he can do best. As for us,
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  titanium and vanadium that our hands can make.

- To make arms tougher, piercing shells harder, planes—ships—
  railroads swifter, cutting tools faster.
  For America speeds on alloys.
  And would to God there were more for the great task
  that lies before us.

LIFTING MAGNETS

For the Steel Industry

By HARRY L. WILCOX
Manager of Productive Engineering Department
Electric Controller & Mfg. Co., Cleveland

Details of magnet coil design, importance of operating temperatures and manner of energizing and de-energizing are discussed in accompanying article. Circular type magnets employed for handling scrap, bipolar magnets for handling rails, pipe and structural material, and, rectangular magnets for handling long plates are compared

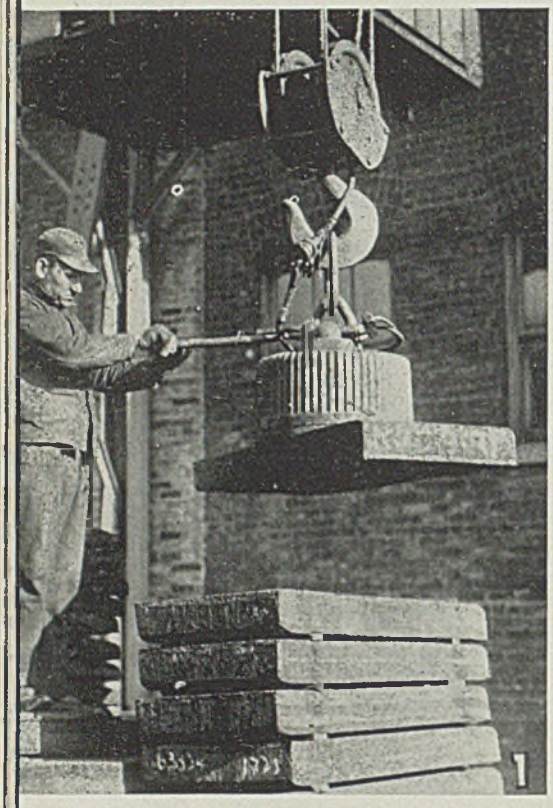


Fig. 1—Circular magnet for handling slabs and plates

Fig. 2—Magnet handling 13,000-pound strip steel coil

Fig. 3—Wooden nail kegs being lifted by their magnetic contents

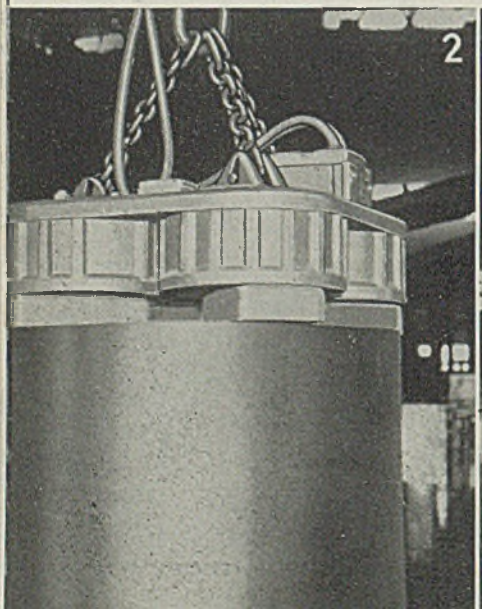
Fig. 4—Two coils weighing 56,600 pounds being lifted by magnet of coil type

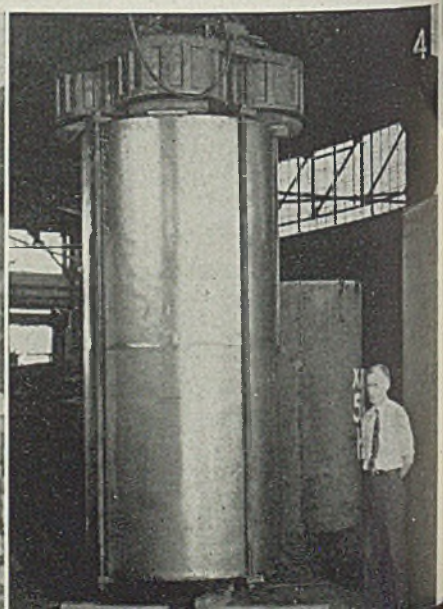
A PIECE of iron surrounded by an insulated wire carrying an electric current is a magnet. Our whole electrical engineering profession is built around this simple gadget. Simple? The laws governing the behavior of electromagnets are simple and as constant as the law of gravity, but it is the varied applications, requiring a corresponding variety in the design to make the best use of these laws, that have made electrical engineering what it is today.

The use of electromagnets may be broadly divided into two classes. First, devices for changing electrical energy into mechanical energy such as in motors, clutches, solenoids, relay and contactor magnets; and second, devices for holding, lifting, or handling magnetic material of which the most common is iron. It is the second class to which this article will be confined. Such devices are extremely useful since they permit lifting or handling magnetic material without any mechanical hooking-on operations and may even be used under conditions which make normal hooking-on impossible. Such is the case as shown in Fig. 7 where a magnet is used to handle cast-iron borings, and in Fig. 9 where a magnet is used to reclaim steel billets from a sunken barge in the Niagara River. Fig. 3 shows a magnet handling wooden nail kegs which are, of course lifted by their contents which are magnetic.

The common form of lifting magnet consists of a cast-steel case with lifting chains, pancake type coil, a nonmagnetic but durable manganese steel bottom plate, all held together by bolts through the inner and outer pole shoes as shown in Fig. 5.

The majority of magnets have their coils wound with copper. Magnets of the type, shown in Fig. 5, use copper strap wound in pancakes on an insulated hub or spider with thin asbestos ribbon separating the turns, and insulating sheet separating the pancakes. The entire coil is vacuum impregnated and after being sealed in the case, the remaining coil cavity is pressure-filled with magnet compound. This magnet compound increases the dielectric strength from the coil to the case, excludes the moisture from the coil





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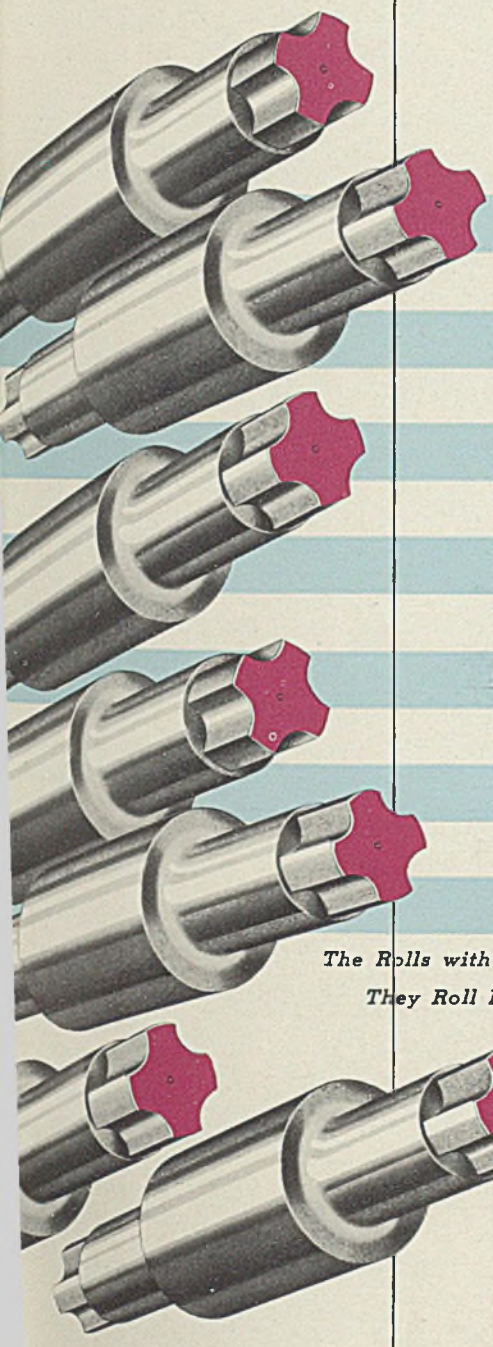

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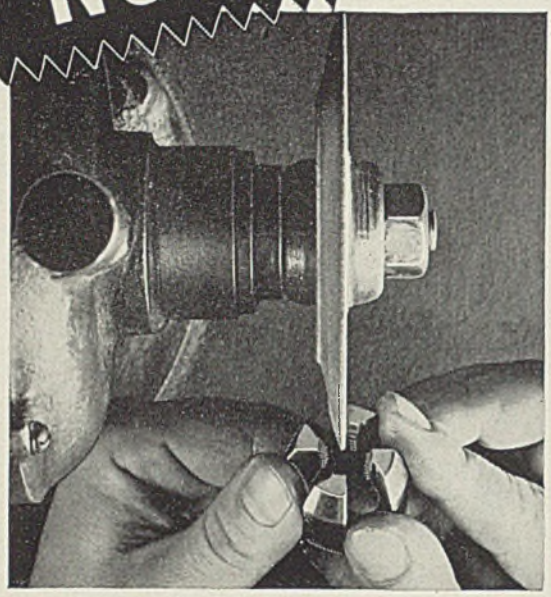
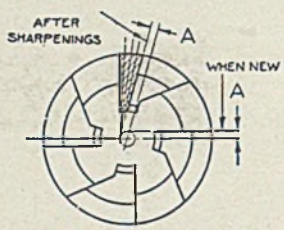


Grinding face on saucer wheel

"*Acorn*" Dies will cut perfect threads until repeated sharpenings have ground away more than half of the lands. Now that universal demand makes it hard to get all the dies you need, be sure you get full value from your present stock—by using them until further grinding is not practical. Here's the way to sharpen them so they will last longest and cut best.

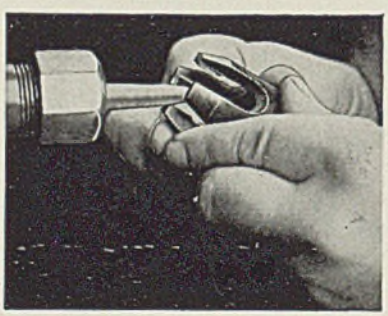
To grind the cutting face hold the die as in the illustration and grind the cutting face on a saucer wheel. Take light cuts so as not to burn the threads. Maintain the original angle of the cutting face with relation to "center" (see diagram). See that the same amount of metal is removed from each land.



When grinding the face, maintain original cutting angle this way

Grind the chamfer at the die's throat with a pencil wheel. (See below.) Put a slight relief on the chamfer; that is, remove more metal toward the heel than at the face. Use a solid rest for your hands to hold the die steady.

Special holders can be obtained for the smaller size dies which are difficult to handle.



Grinding chamfer with pencil wheel

If properly ground, the die will still cut perfect threads, even though the lands are quite thin.

Actually "*Acorn*" Dies are very easy to sharpen and a little practice will enable anyone to do a good job and double or treble their normal life.

This is one of a series of advertisements published by Greenfield Tap and Die Corporation to help users get greater production from their small tools in these critical times, through making useful facts more widely known

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and acts as a heat transfer medium.

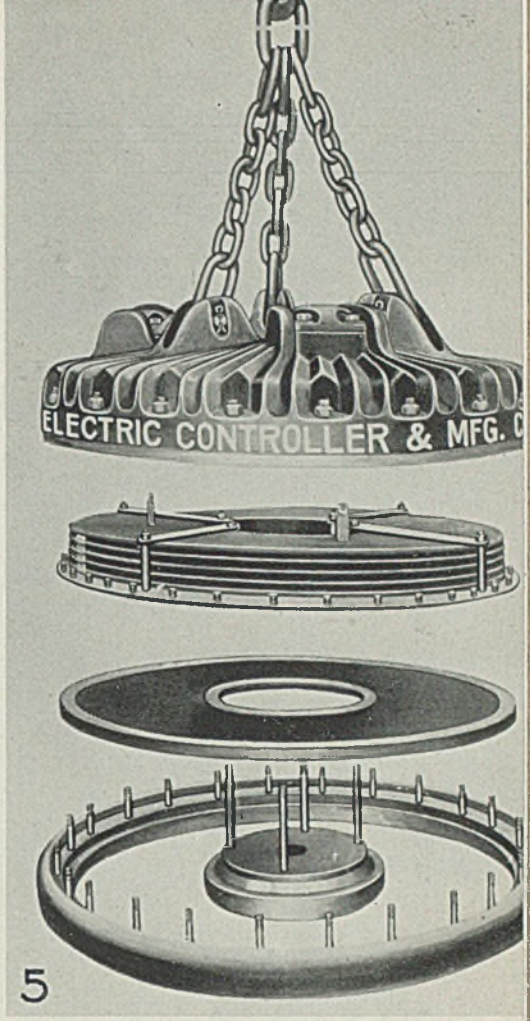
Lifting magnets usually operate at temperatures much higher than other electrical apparatus. The coils are worked hard because putting in more copper in order to operate cooler would mean more dead load. Advantage also is taken of the intermittent operation to work the coil harder while it is energized. To further add to the magnets' discomfort, they are often used to handle hot ingots or slabs. The coils are well able to stand this heat but it is the rise in coil resistance which fixes the maximum working temperature rather than the destructive effect of the heat.

Importance of Coil Temperature

As the coil heats up its resistance increases and with a given voltage applied, the current and the ampere turns will decrease causing the lifting power to decrease. This temperature effect is inevitable as long as copper continues to act as it does. Anything that can be done to decrease the working temperature of the magnet will help to retain its lifting ability. The cases of these magnets are ribbed to give maximum radiating surface for a given mass. Energy must be put into a magnet if it is to do work and this energy must be dissipated. Operators can help this condition by not leaving the magnet energized any longer than is necessary in order to pick up, carry and drop the load. If lifting magnets are carelessly left energized they will overheat because it is not economical to build a lifting magnet for continuous energization. Operators sometimes make the mistake of energizing a magnet too soon when lowering on a pile of scrap. This causes the scrap to turn endwise to the magnet and prevents making as big a lift as if the magnet were settled on the pile before energizing it.

Separator magnets are designed more liberally. They are expected to stand continuous excitation and the weight of the more liberal coil is not a disadvantage since the magnet usually is mounted stationary and the material from which the magnetic pieces are to be separated flows past or under the magnet. A separator magnet usually has a flat bottom, while a lifting magnet has protruding pole shoes designed to stand rough handling.

Fig. 5—Component parts of common form of lifting magnet



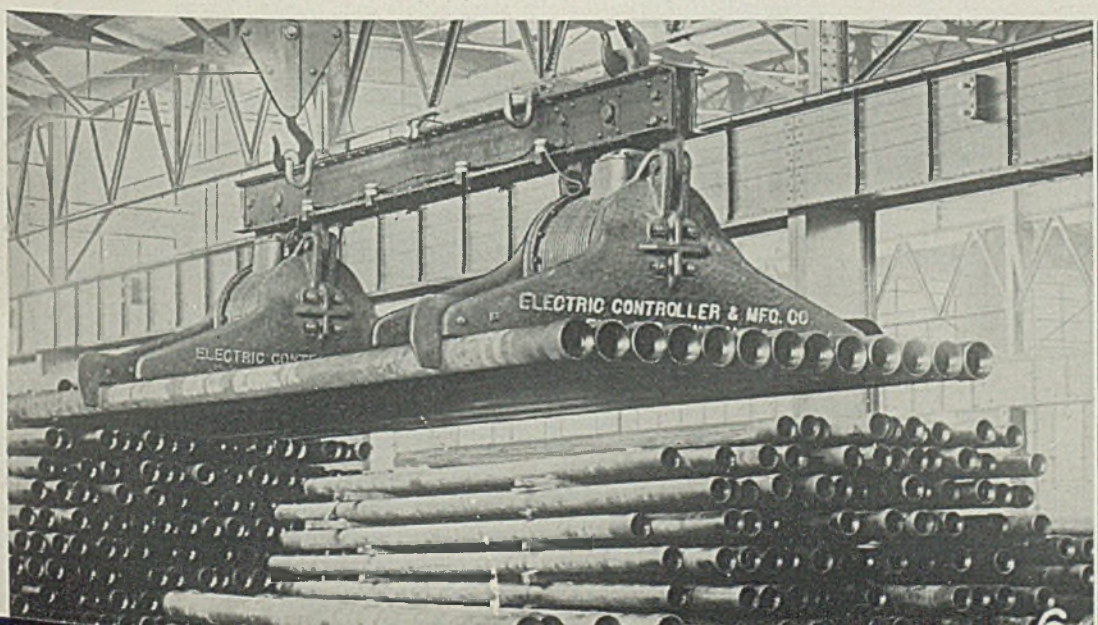
The manner of energizing and de-energizing these magnets is important. The magnetizing current varies with the size of the magnet and is in the neighborhood of 70 amperes at 230 volts for the 65-inch magnet. The inductance of a lifting magnet is high and, therefore, a simple knife switch can not make and break the current. In order to relieve the magnet coil of the high induced voltages when the circuit is broken, it is necessary to connect a discharge resistor across the magnet terminals just prior to opening the circuit. This also makes it easier for the controller to open the circuit and relieves the winding of high discharge voltages which are liable to puncture the insulation.

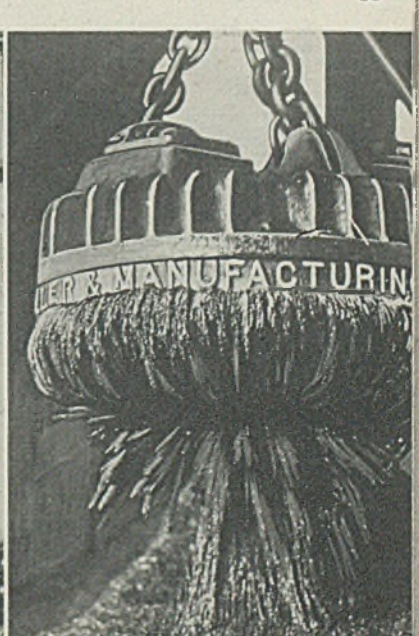
However, if a magnet is merely de-energized with a discharge resistor across its terminals, it will be unsatisfactory from the standpoint of operation. The magnetic flux will die out in the magnet slowly causing the load to dribble off especially where the load is mainly scrap or varied sizes of iron. In order to make the magnet discharge its load quickly and clean, it is customary to apply a reverse current to the magnet immediately after opening the lift circuit. The controller then automatically interrupts this reverse current at the instant that the flux in the magnet is passed through zero. If the reverse current is cut off too soon, many of the smaller pieces will adhere to the magnet. On the other hand, if the reverse current is held on too long by slow or late opening of the reverse contactors, the magnet will start to drop its load and then some of the lighter pieces will be seen to jump back to the magnet. An enclosed magnet controller is shown with door open in Fig. 8.

These circular type lifting magnets are manufactured in a variety of diameters. For handling large amounts of scrap material, the larger diameters are essential, but for handling small individual plates

Fig. 6—Bipolar magnet operating in tandem for handling long pipe

Fig. 7—Magnet used for handling cast-iron borings





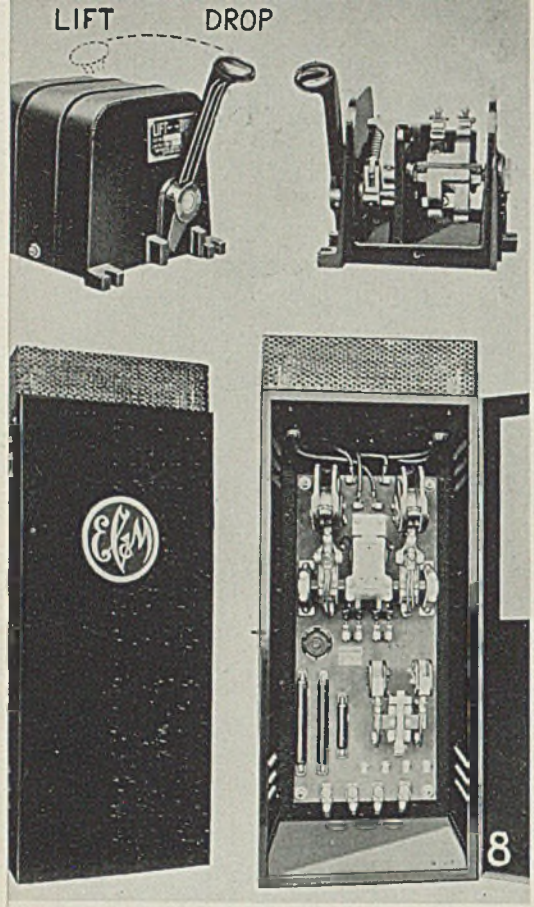


Fig. 8—Enclosed magnet controller

or slabs, a much smaller circular magnet Fig. 1, is often convenient.

In addition to the conventional lifting and separating magnets as described, the steel industry has found other forms of magnets highly practical for certain types of work. Bipolar magnets are used for the orderly handling of even layers of materials such as rail, pipe and structural shape. Fig. 6 shows two of these bipolar magnets operating in tandem for handling long pipe. Rectangular magnets are useful for handling steel plates and sheets. Three of these rectangular magnets carried on a suitable spreader beam are shown in Fig. 10.

The increasing trend toward coiled strip both hot and cold rolled has led to the development of the coil handling magnet shown in Fig. 2. This magnet has certain advantages over the conventional circular magnets for handling coiled strip, although one would think offhand that the latter would be ideally suited for lifting coils on end. The coils are wound up like a clock spring with a hole in the center and a circular magnet placed concentrically on the end would have its center pole directly over the hole in the coil where it can do the least good. If the energized magnet were lowered onto the end of a coil it would slip sideways to an eccentric position where the flux would be more effective. If the magnet were carefully placed concentrically on the coil and then energized, it would probably fail to lift the coil or it would again slide sideways causing the magnet and coil to hang at an angle making restacking difficult.

Sometimes circular magnets can be used to lift two coils of strip at once and this permits the coils to hang straight. This is often done in handling hot rolled strip from the coilers to storage when the strip has not yet been trimmed. The circular pole shoes of the standard lifting magnets have a tendency to damage the edges of the strip but this may be permissible where the coils undergo subsequent rolling or trimming.

Multiple coil and pole shoe magnets are particularly well suited for handling trimmed coiled strip from the cold finishing mills to storage and from the annealing furnaces. They pick up a coil without other foreign material, such as chips, scale or coil spacers, adhering to the bottom of the coil, which might injure the bottom edges of the strip when the coil is set down. Their compact dimensions make the magnet about the same diameter as the coil it will lift. The economical flux distribution makes the magnet lighter for its lifting ability than other magnets. This saving in weight often may permit the use of the crane auxiliary hook at higher speeds. The flat pole shoes do not injure the top edges of the strip and they distribute the flux in a manner which prevents telescoping of the convolutions. The coil always is handled level which facilitates stacking with less tendency to injure the lower edges of the strip.

These type magnets consist of two or four coils and pole shoes mounted on a cast-steel yoke complete with lifting chain and cable entrance bushings. The magnet coils have nonmagnetic protective cases in order to decrease leakage flux and are connected alternately for opposite polarity so that the magnetic flux enters the strip at one pole and leaves it at the next pole.

The two-coil magnet was designed to handle smaller coils of strip steel weighing 10,000 pounds or less which are common in tin mills.

The four-coil magnet has four pole shoes and was designed to handle coils of steel weighing up to 18,000 pounds. Soon thereafter came a demand for a similar magnet to handle coils of the same size but with irregular ends due to untrimmed strip. This requires more ampere turns for a given size of magnet. The No. 4D type CSM was the result. On similar work this magnet would lift about 24,000 pounds against 18,000 for size No. 4.

The six-coil magnet was designed to handle 58,000 pounds with a liberal factor of safety. In the cold rolling process there is economy in large coils, often made by welding smaller coils together, because it decreases the number of threading-in operations and loss of strip in getting down to gage. Twenty-ton coils are, so far, about the maximum size. In order to get a suitable test load for the six-coil magnet, two coils of strip were clamped together end to end. To simulate some irregularity of coil end and consequent loss of lift, pieces of 7/16-inch lumber were placed between the coil and the magnet. Fig. 4 shows the six-coil magnet lifting two coils totaling 56,600 pounds.

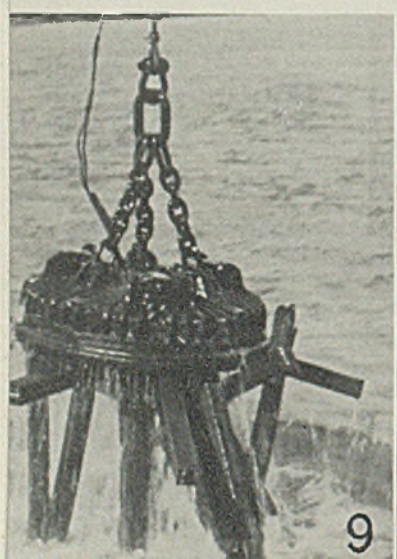


Fig. 9—Magnet being used to reclaim steel billets from sunken barge

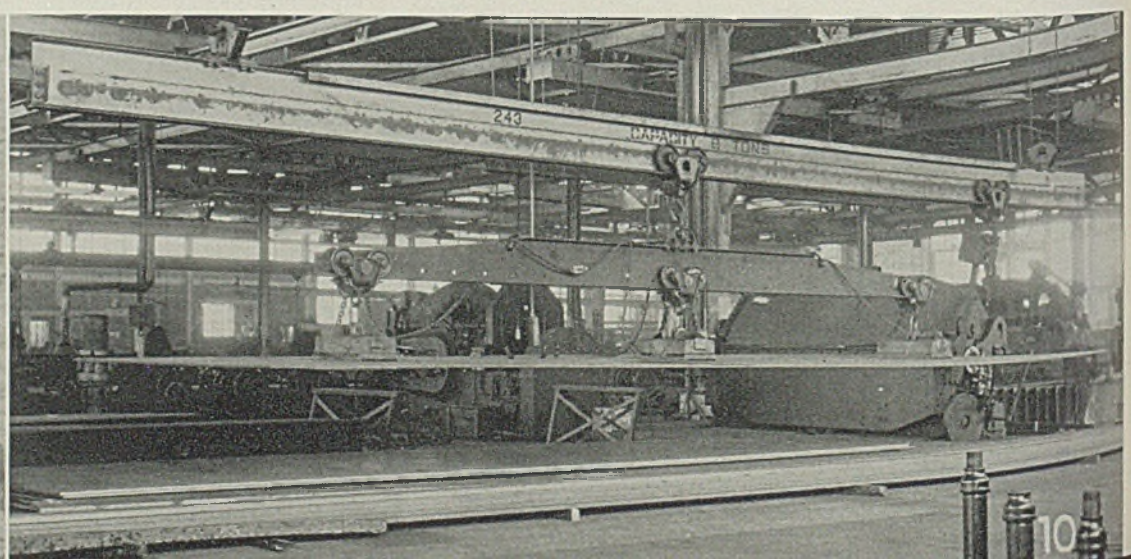
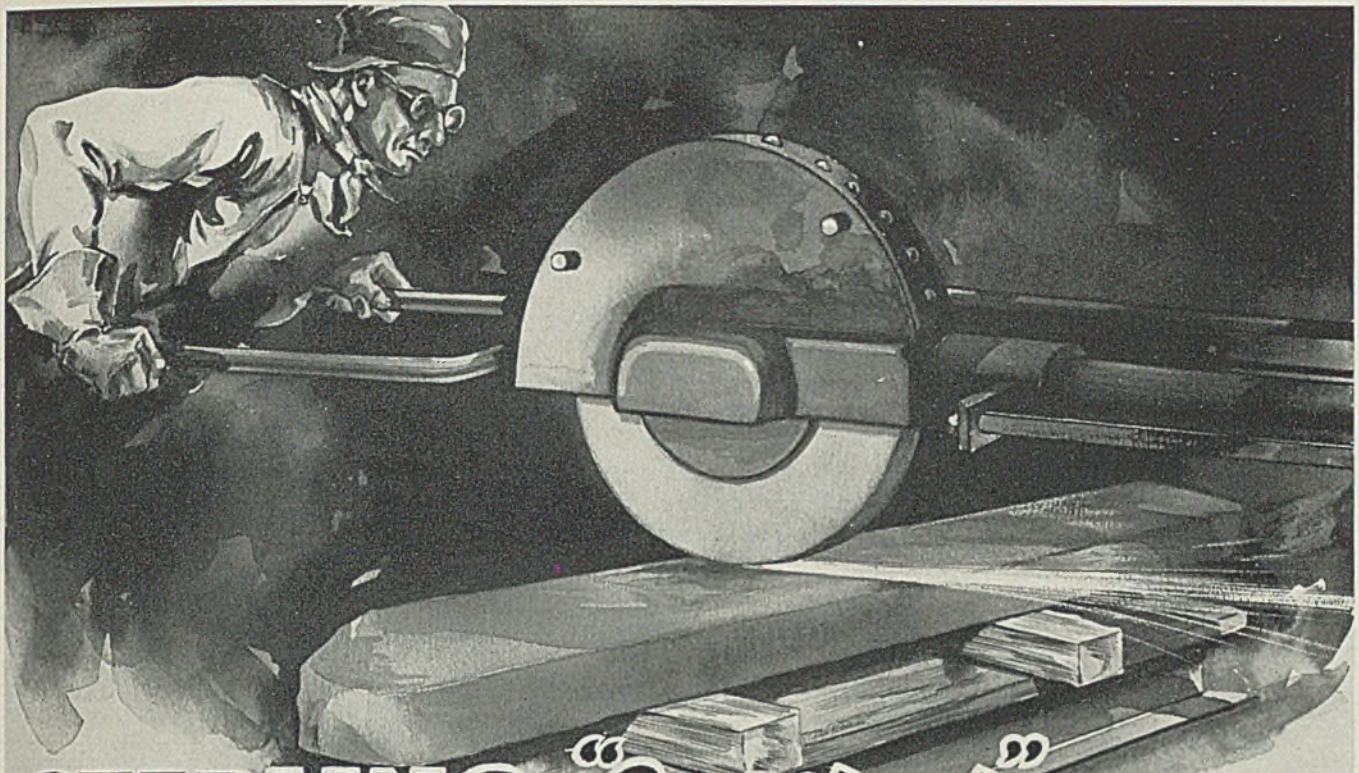


Fig. 10—Three rectangular magnets carried by spreader beam which handle plates



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This development of the serrated channel began in 1935 as a result of the practical application of welding in the construction of hulls for inland waterways. In welding, the flange of the channel that formerly rested on the plate and provided a seat for the rivet was no longer required. In fact its presence made the welding job more difficult. By using a larger channel and serrating it, the objectionable flange is removed, and a member provided that is stronger in proportion to its weight and better adapted to welding.

The efficiency of this new reinforcing member is best illustrated by a review of the facts revealed when structural framing of the first all-welded coal barge built by Dravo, in 1935, was considered. This welded barge was a duplicate of the standard riveted Ohio river barge in use at that time.

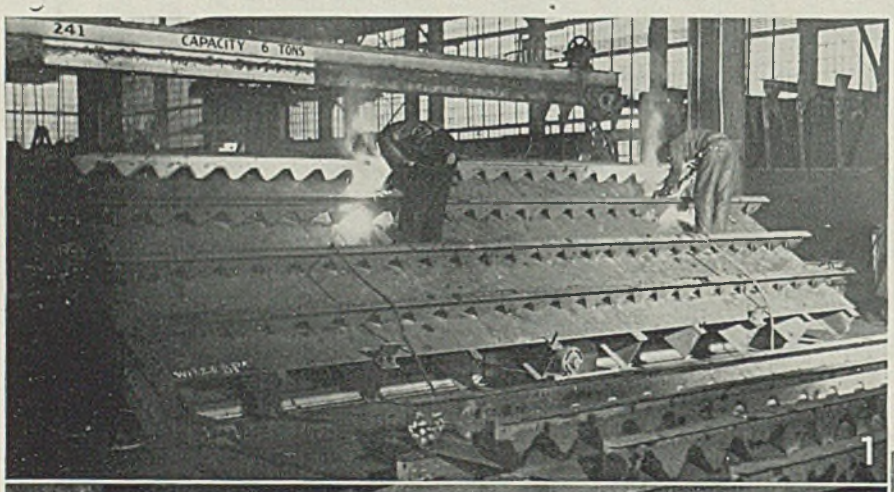
For floor beams on the riveted barge, 10-inch, 20-pound channels on 5/16-inch shell plate were used by employing a larger member and serrating it to a depth of 9½ inches. This resulted in an increase of 28 per cent in the ratio of strength to weight.

The multiple usefulness of this development was immediately apparent. Aside from providing greater strength in proportion to weight, the serrated channel, when used as floor beams, allows free flow of liquid cargo to pump suctions or of bilge water to the siphon. On liquid carriers, necessary space for passage of air between deck beams also is provided. The fact that the toe weld runs completely around the base of each serration eliminates the danger of corrosion since the surface is thoroughly sealed by the weld.

The weight saving varies from 1½ to 3 pounds per foot of beam, according to the size of the member processed. Total weight saved and made available for additional payload on a standard oil barge is about 11,000 pounds; and on a standard coal barge, 4700 pounds. Some 100 such hulls are made by Dravo in a normal year so requirements of serrated members easily justify making the necessary punch and dies. See Fig. 3, directly below.

Serrating is accomplished by

(*Please turn to Page* 96)



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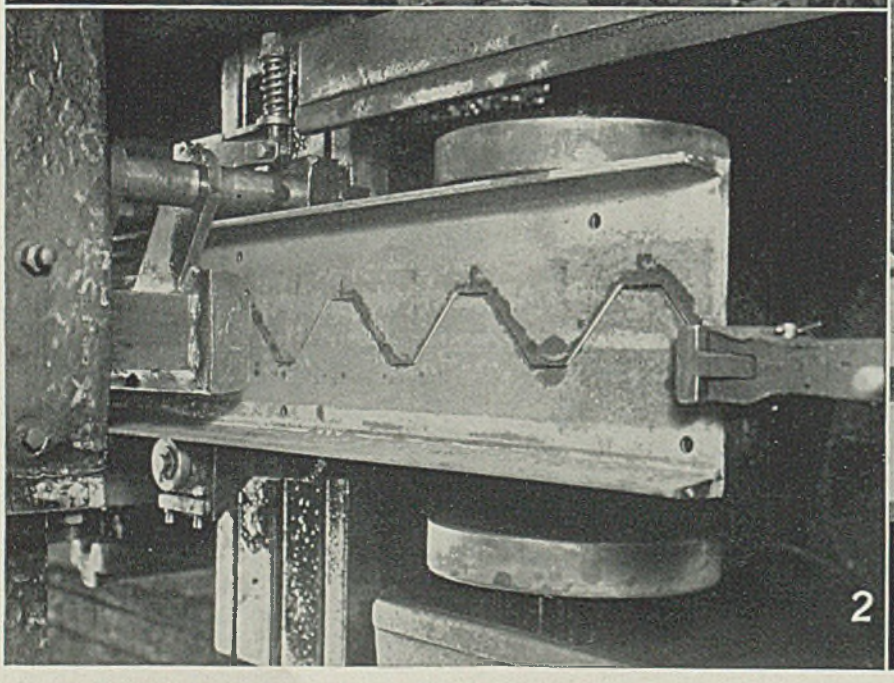
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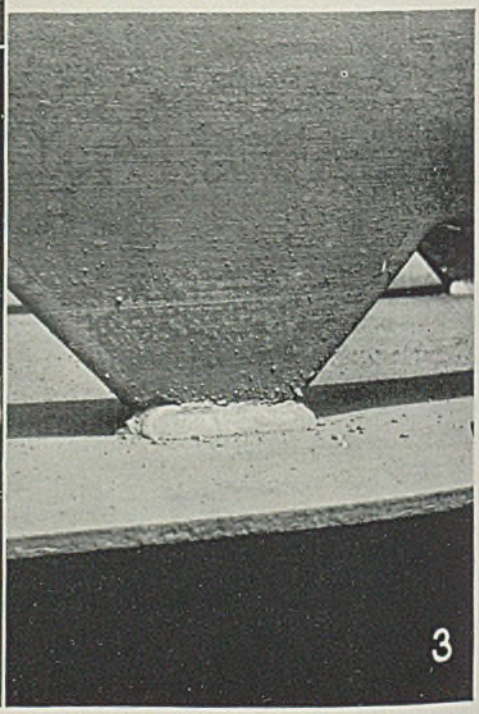
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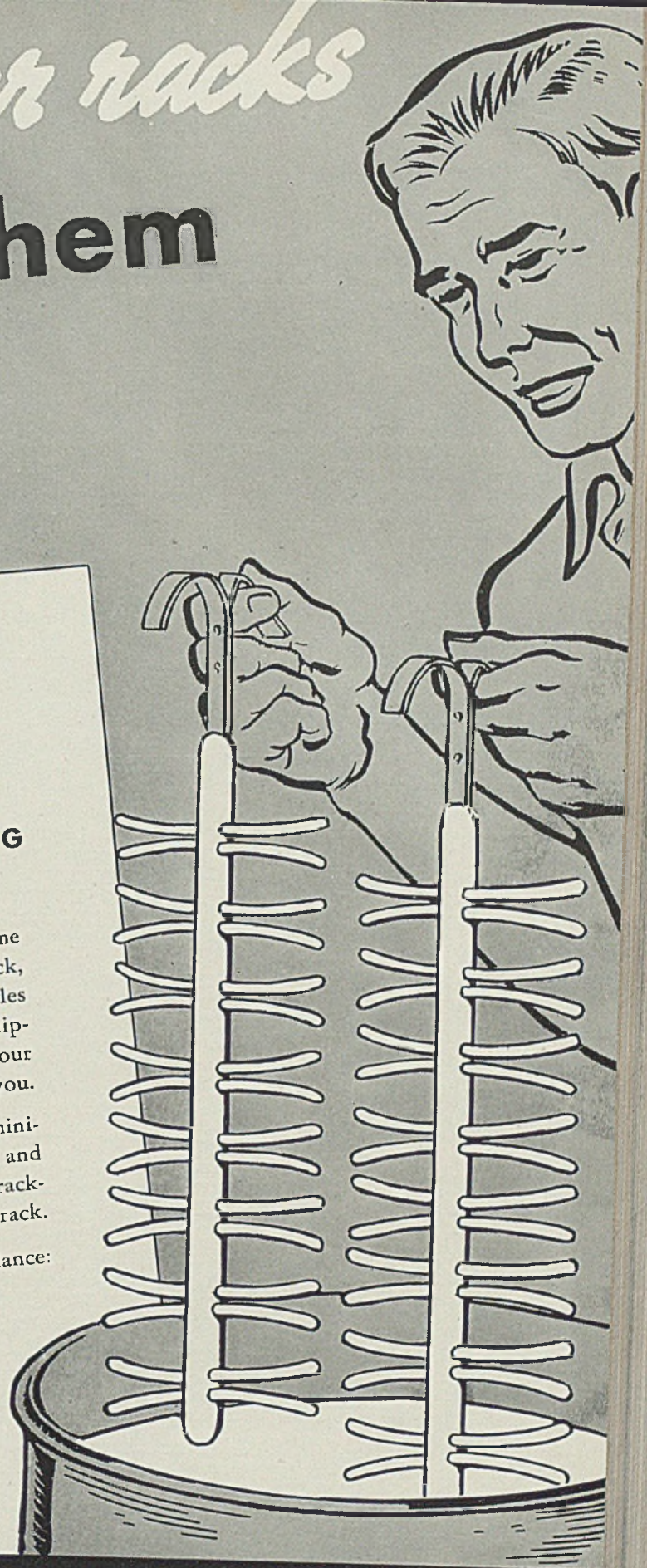

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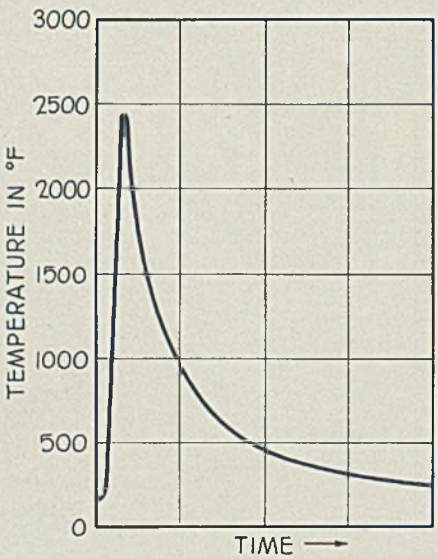
WELDABILITY

A Matter of Cooling Rates

By HAROLD LAWRENCE
Metallurgist and
Welding Engineer

■ ALMOST everyone agrees a perfect weld is one that cannot be distinguished from the base metal it joins. The chemistry should match that of the base metal; the physical properties should check those of the base metal; and the microstructure of the weld should be identical with that of every portion of the base metal.

Were metallurgists able to devise a welding process that would bring about these ideal conditions in a welded joint, the day of welding utopia would be at hand. However, in welding, as in any other pursuits of this world, compromises become necessary. Both the chemistry and the physical properties approach the desired state. With the microstructure we may be more fortunate, as the application of widely accepted metallurgical practices enables the welding engineer to produce a desirable microstructure at will.



Dr. R. H. Aborn of the research laboratory of the United States Steel Corp. has frequently stated that weldability is the antithesis of hardenability. This truth is indeed fortunate for it makes available to the welding metallurgist a vast fund of experimental data that has already been accumulated to explain and forecast the behavior of steels undergoing a hardening treatment. By applying this same information to the matter of preventing welds (welded joints) from exhibiting vast differences in microstructure, excellent predictions regarding the matter of weldability are possible.

Very likely the best approach to the study of cooling rates and their effect on weldability is the review of an actual happening. A welding engineer in the employ of a pressure vessel manufacturer was making a routine bend test as prescribed in the pressure vessel code put out under the joint auspices of the American Petroleum Institute and the American Society of Mechanical Engineers. The weld and test plate from which the bend test coupon had been taken showed no flaws whatsoever upon radiographic examination. Yet the bend test specimen failed with a sudden snap indicating that something was definitely wrong. Where the bend elongation in the free bend test was required to meet a minimum elongation of 30 per cent, the broken specimen had barely reached a bend elongation of 4 per cent.

To complete our background of this case we should know that the steel was 2¾ inches thick and conformed to the ASTM Specification A212. Moderately high carbon and manganese are permitted by this specification with the carbon closely approaching the limit of 0.35 per cent maximum, that is recommended for satisfactory base metal weldability. Furthermore the welding engineer realized that he was dealing with a comparatively heavy section of a steel containing an appreciable amount of carbon. For this reason he preheated to 400 degrees Fahr., although there is good reason to believe that the preheat may not have been maintained at this level.

Notwithstanding the precautionary measures attempted, the early failure of the bend test was definite proof of an unsatisfactory joint. The next step was an examination of the defective test piece under the microscope. Here the heat af-

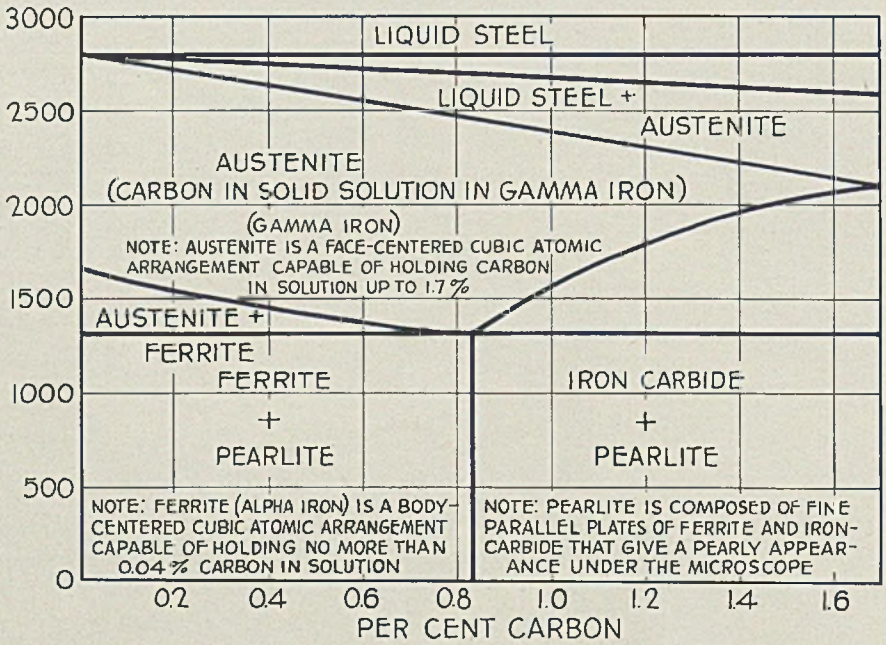


Fig. 1. (Above)—Time-temperature curve for the heat affected zone of a weld
Fig. 2. (Below)—A very much simplified iron-carbon solution diagram

Bibliography

"Metallurgical Aspects of the Welding of Steel," by E. S. Davenport and R. H. Aborn, "The Welding Journal," October, 1936.
"Weld Hardening of Carbon and of Alloy Steel," by H. J. French and T. N. Armstrong, ibid., October, 1939.
"Metallurgical Changes at Welded Joints and the Weldability of Steels," by R. H. Aborn, ibid., October, 1940.
"Heat Flow in Arc Welding," by E. M. Mahla, M. C. Rowland, C. A. Shook and G. E. Doan, ibid., October, 1941.
"USS Carilloy Steels."
"Metallurgical Dialogue," by Albert Sauveur.
"Principles of Heat Treatment," by M. A. Grossmann.

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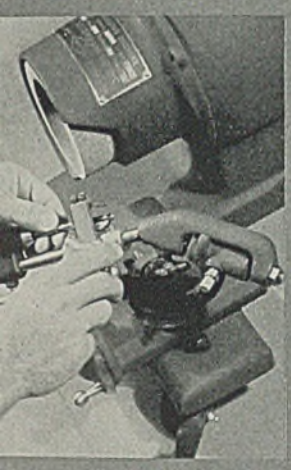

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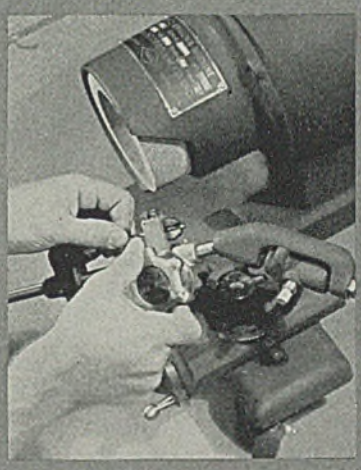

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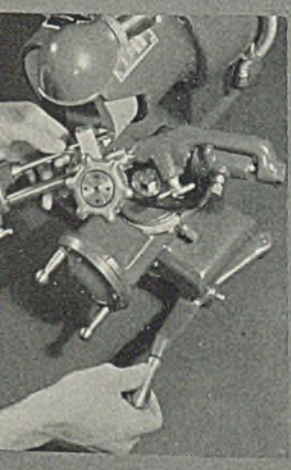

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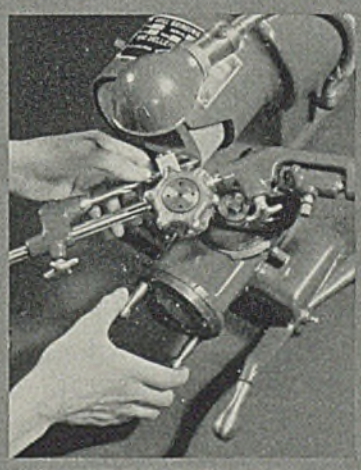

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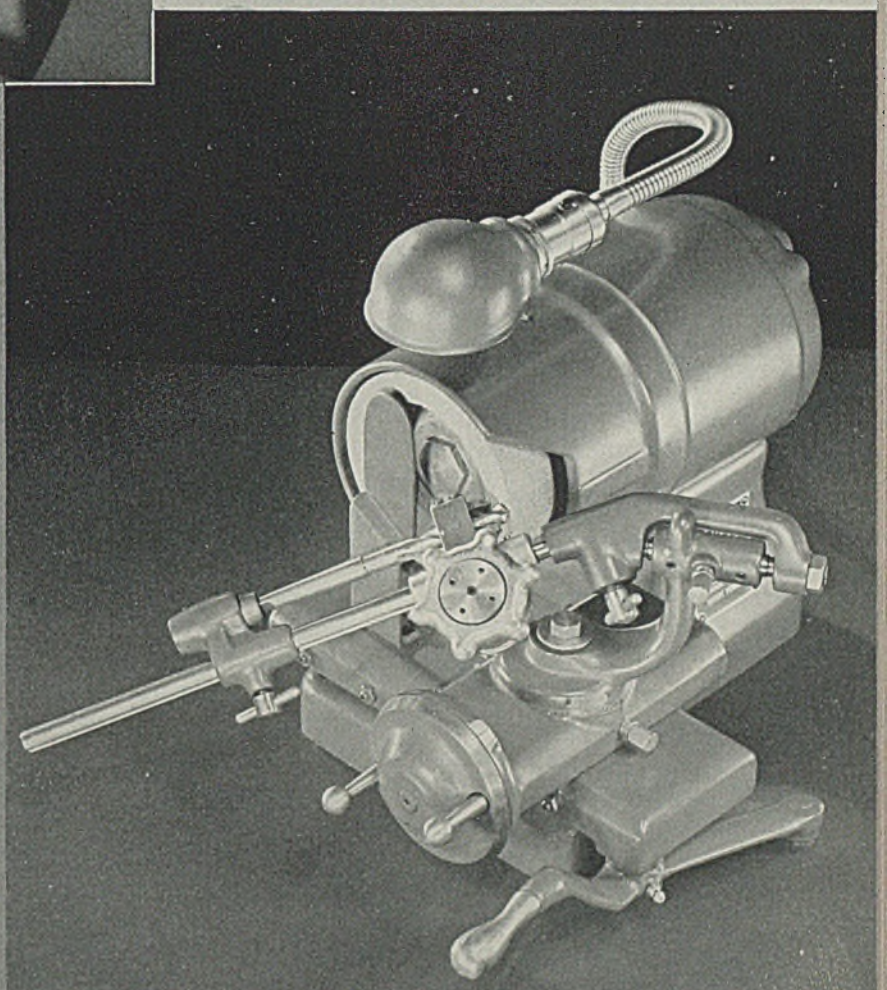

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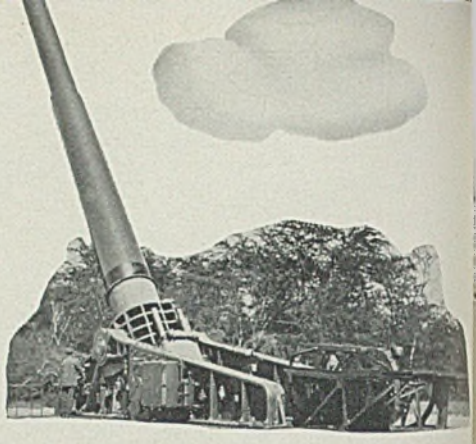

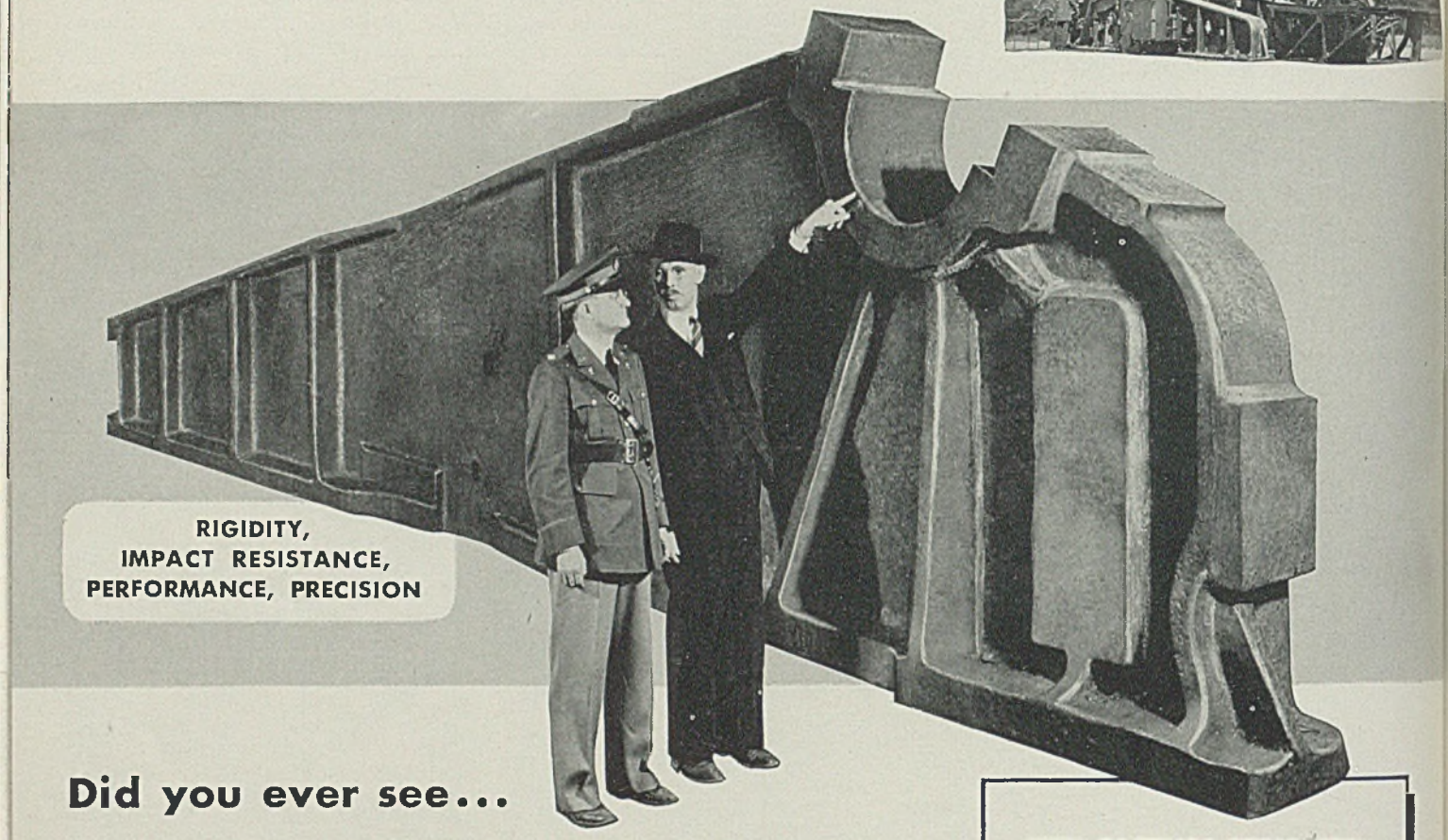

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fected zone was seen to consist of martensite—a hard, brittle state in which steel is sometimes found, after welding. An investigation of a sample cut from each end of the longitudinal seam of the shell revealed the same microscopic constituent. Thus the failure resulted from improper heat treatment; the base metal possessing excellent hardenability (and a measure of poor weldability) was entirely responsible for the inadequate joint. No blame could be attached to the welder, unless he failed to maintain his preheat, and no blame could be directed at the welding electrode.

Fortunately in this case there was a remedy short of cutting out the weld and the heat affected zone. The problem came about as a result of too great a rate of cooling. The solution lay in slower cooling. Therefore the entire vessel shell was reheated to a temperature above the critical and allowed to cool in still air. Thereby the carbon of the martensite was taken into solution as austenite and allowed to cool at a rate slower than the critical cooling rate to form the ductile structure of ferrite and pearlite that is desired in all weldments. Since some of these metallurgical terms may have become a bit confusing, a review of the mechanism of carbon solution and the part it plays in hardenability and weldability becomes necessary.

Speed Influences Temperature

Fig. 1 is a typical time-temperature curve for the heat-affected zone of a weld. This curve applies to a particular point, probably quite close to the weld. The maximum temperature reached depends upon the heat input of a welding electrode. Of course a 3/32-inch diameter electrode used at 70 amperes would not bring the maximum temperature of a point in the heat affected zone anywhere near as high as a 5/16-inch diameter electrode used at 460 amperes. Nor would the maximum temperature reached be as great if the 5/16-inch electrode were progressed along the joint at 30 inches per minute as it would have been if the electrode moved ahead at a rate of only 12 inches per minute. Thus it is evident that heat input and speed of travel influence the maximum temperature reached by a portion of the heat-affected zone of a weld.

Although the cooling portion of the curve of Fig. 1 seems to have a steep drop from the highest temperature reached, about 2450 degrees Fahr., a thicker plate would make the drop even more precipitous. A thick plate at a winter atmospheric temperature close to zero would make the curve steeper yet. On the other hand a plate that has been preheated to 400 degrees Fahr. would produce a much less drastic drop in the cooling curve. Besides the slower fall of temperature with time, there would be a higher temperature reached in the last part of the curve which is shown in this example to be below 400 degrees Fahr. So preheating reduces the speed at which the temperature becomes lower as well as buffering against a very low final temperature immediately after the electrode passes the point under observation.

Must Watch Temperature

Keeping in mind the cooling curve of Fig. 1, consider the very much simplified iron-carbon diagram of Fig. 2. Here is a chart of the state of a weld-heat-affected zone at different temperatures and with varying amounts of carbon. Of course this chart assumes that enough time elapses to allow the constituents to come to equilibrium, but for our purposes this question of time may be omitted without impairing the quality of our analysis.

Our interest is centered in the left hand portion of the diagram and will be confined to a 0.35 per cent carbon steel for the most part, the steel of the example mentioned above. As the electrode passes, the temperature of the heat-affected zone rises rapidly to 2450 degrees Fahr. Following the 0.35 per cent carbon line to a temperature of 2450 degrees Fahr., we find that the steel is in the austenitic state. Austenite is the gamma form of iron with a face-centered cubic atomic arrangement capable of holding carbon in solution up to 1.7 per cent. Therefore by taking our heat-affected zone to this temperature we have dissolved all of the carbon into a solid solution known as austenite. In almost every welding operation this state of affairs will come about in the heat-affected portion of the base metal.

Taking a man up in an airplane is not a dangerous operation. Nor is jumping out of an airplane at a high altitude hazardous if the required precautions are observed. It's the sudden stop at the end of the fall that kills. In the same way, bringing carbon into solution as austenite will not harm the weld if we make our temperature descent slowly enough.

As the heat-affected zone of the 0.35 per cent carbon steel cools, ferrite separates from the austenite at just a little below 1500 degrees Fahr. Ferrite is alpha iron possessing a body-centered cubic atomic arrangement with almost no capacity for holding carbon in solid solution. The maximum carbon solubility of this phase is 0.04 per cent, so slight as to be practically without interest in this discussion. The

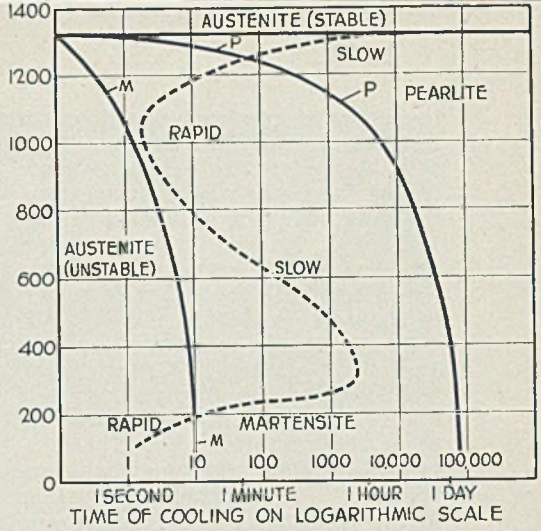


Fig. 3—Above, much simplified S-curve of austenite decomposition with two hypothetical curves of cooling of heat-affected zone

temperature continues to drop, still very slowly, until at a temperature of 1340 degrees Fahr. the carbon comes out of solution as iron carbide, Fe_3C. This precipitation is unusual in that both the carbon in the form of iron carbide and an equal amount of ferrite form together in alternate platelets or lamellae that the pioneering metallurgist, Sorby, named pearlite because of its pearly appearance under the microscope.

That's the whole story of the changes in carbon solution that come about as a result of slowly raising and lowering the temperature. But welding is done quickly which means that the rates of heating and cooling are quite rapid. No matter how fast these heating rates become, the solution of carbon in iron that forms austenite always takes place. With our 0.35 per cent carbon steel, all welding operations tend to put the carbon in solution where the properties of the heat-affected zone can be determined by cooling rate alone. The record of what happens to the heat-affected zone from that time on is concerned with the decomposition of austenite that takes place as a function of the rate of temperature descent.

The research laboratory of the United States Steel Corp. has done a great deal of work in the field of austenite decomposition which has been of inestimable value in the study of changes in structure brought about by welding. The S-curve of Fig. 3, much simplified to suit the needs of this discussion, is based upon that work. Cross hatching is superimposed on the curve to point out that a time interval exists between the beginning and the end of the austenite decomposition or transformation at any temperature. Under no circumstances should this transformation be thought of as instantaneous or the proper conception of the transformation mechanism will be

lost. For convenience the diagram is labeled "rapid" at about 1000 to 1100 degrees Fahr. and the same "rapid" at slightly above room temperature; while it is labeled "slow" just under the equilibrium temperature of 1340 degrees Fahr. and again "slow" in the range from 300 to 900 degrees Fahr.

In addition to the S-curve in Fig. 3 are two hypothetical cooling curves which cross the S-curve. One is marked with a letter "P" while the other bears a letter "M". These refer to pearlite and martensite respectively. Of course the further to the right we go, the slower are the cooling rates. And slower cooling rates mean softer heat-affected zones.

The whole question of cooling rates can be predetermined if the S-curve for the steel in question is available. All that is needed is some means to make the cooling curves pass to the right of the nose of the S-curve, which exists between some 900 and 1100 degrees Fahr. as Dr. Aborn pointed out in the Welding Research Supplement of the *Welding Journal* for October, 1940. When this takes place, the resulting structure is pearlitic and ductile.

But should the cooling rate be so rapid as to pass to the left of the nose of the S-curve allowing the transformation to occur at or near room temperatures, martensite is the end product. Martensite, being hard and brittle, as was mentioned earlier, introduces a discontinuity in the structure of the joint. Then, too, there is always a possibility of cracks when martensite is present in the base metal adjacent to a weld.

Intermediate between the cooling curves shown in Fig. 3 are thousands of other curves. All those to the right of "P" lead to softer and more ductile decomposition products. Those between "P" and "M" indicate increasing hardnesses as "M" is approached. All those to the left of "M" are equal to the hardness of "M" if "M" represents 100 per cent of the possible martensite.

The welding engineer may control his cooling curves by preheating, making sure that his preheat temperature is attained and held throughout the full welding operation. The use of Tempils, temperature pellets that melt at known surface temperatures (or Tempsticks that do the same thing, in a stick of crayon form) is highly recommended. Applying large-diameter electrodes at high current values with a slow enough rate of travel is another means of bringing about a soft heat affected zone.

The amount of carbon present in the weld has an important influence on the hardness of the heat-affected zone because martensite has varying degrees of hardness depending upon the carbon it contains. Carbonless iron cannot be heat treated because there is no hard martensite formed. In Fig. 4 is shown the effect of carbon on the maximum weld hardness as reported by French and Armstrong. For carbon contents of 0.20 per cent and less, there is no appreciable hardening of the heat-affected zone. From 0.20 to 0.35 per cent carbon there is a marked rise in hardness, and the reason for choosing a ceiling of 0.35 per cent carbon for weldable steels becomes apparent.

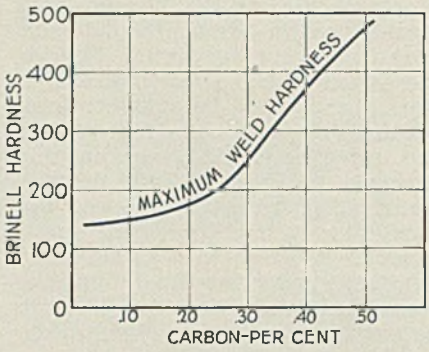
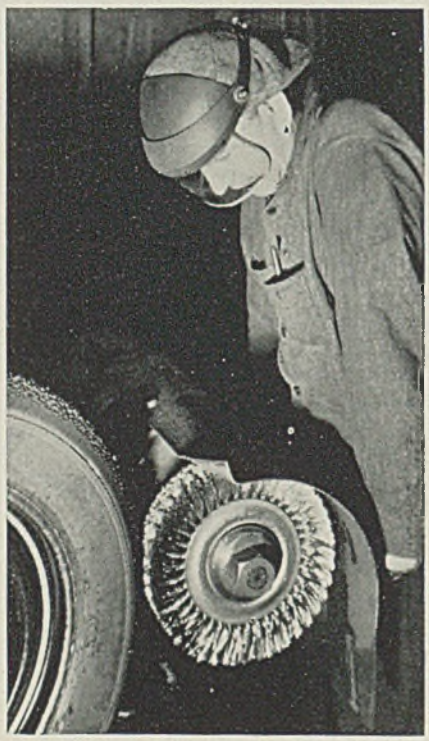


Fig. 4—Above, effect of carbon content in plain carbon steels after weld hardening procedure

Within the limits of carbon established for good weldability, cooling rates become indices for the proper welding technique to be followed for the avoidance of martensite. Cooling rates are determined from the heat input and speed of travel, along with the heat capacity of the joint. Thicker joints extract heat quite rapidly, leading to critical cooling rates. Thus preheat may be indicated for thicker steels.

However the critical cooling rates are reached more quickly as the carbon content increases. At the same time the hardness of any martensite formed is greater. Therefore deference must be paid to all of these factors to promote welding conditions that will not be subject to the brittleness that results when martensite is allowed to form. To the degree in which the welding engineer prevents martensite, depends his success in utilizing his chosen base metals as weldable steels.

Retreading "Aid"



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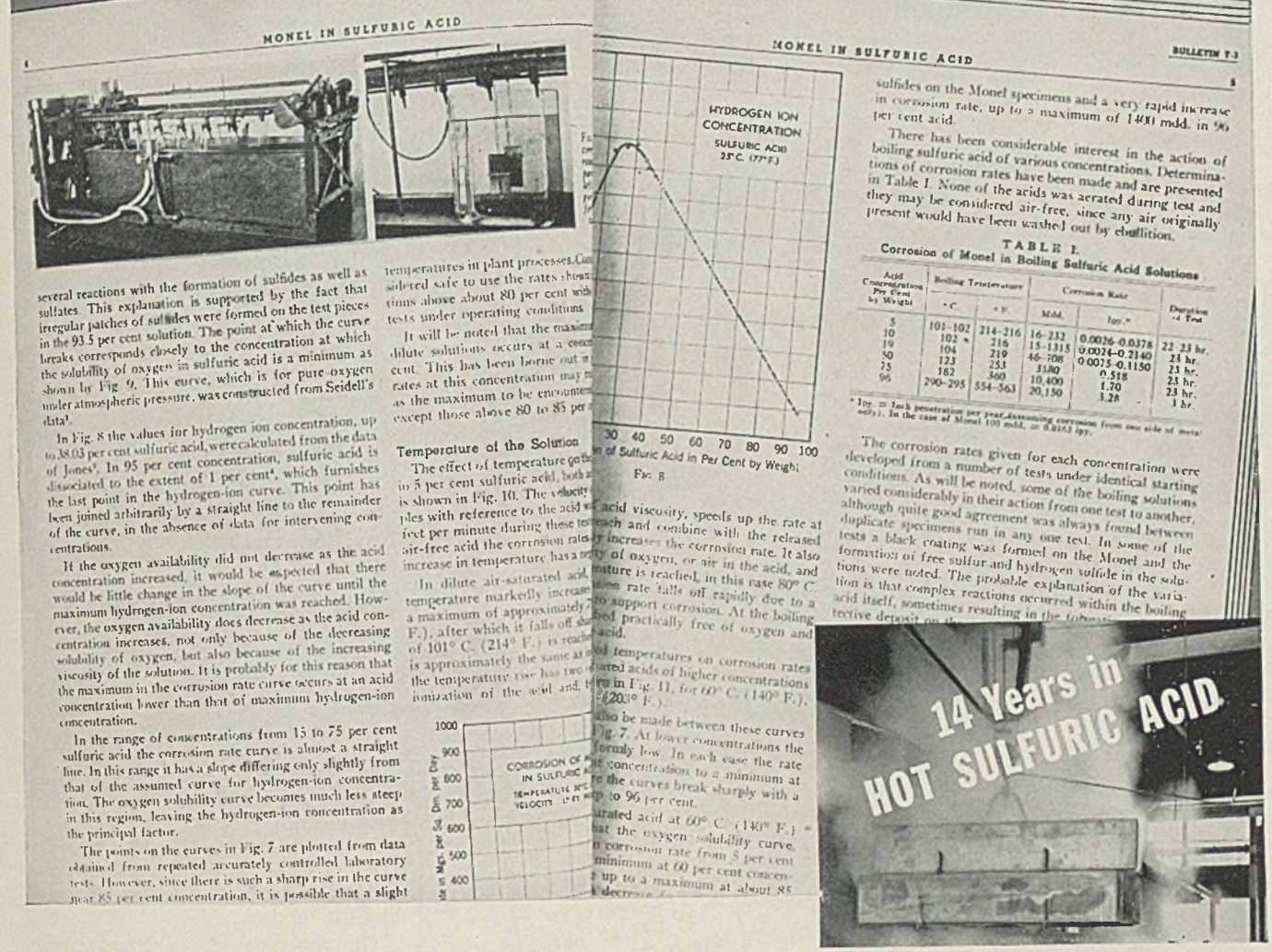
WHAT DO YOU KNOW ABOUT Sulfuric Acid vs Metals?



Important Facts about Sulfuric Acid for Pickling Room Superintendents

A useful addition to your technical library is the INCO book on Sulfuric Acid. Here is a useful discussion of the corrosive action of various concentrations of sulfuric on metals. Factors influencing such corrosion—acid concentrations, temperature, aeration, velocity, film formation and oxidizing salts in the solution — are carefully considered. There is also a special section on the problems encountered in pickling iron and steel. Many useful tables and illustrations are included. Write for this bulletin today.

★ ★ ★

FIRST THINGS FIRST — *With the Nation at war, supplies of Monel, Nickel and Nickel Alloys are needed for our armed forces. Although all efforts must now be aimed toward victory, The International Nickel Company will continue to offer information to metal users who are concerned with the war efforts of today and the peace-time progress of the future.*

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

14 Years in HOT SULFURIC ACID

Whether you use crates, racks, or baskets, and chains, hooks, bolts, nuts, tie-rods . . . made of Monel they will stand up for years against solutions of hot sulfuric. Furthermore, light-weight welded Monel construction permits bigger payloads, easier handling and speeds up pickling.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N. Y.

Gentlemen:
I would like more information on Sulfuric Acid.
Please send Bulletin T-3 to . . .

Name .....*Title* .....

Company .....
S-1-26-'42

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MONEL (INCO MONEL)

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

Points Way To Avoid Labor Law Violations

■ *Federal Labor Laws*, by Russell L. Greenman and Leslie L. Sanders; cloth, 40 pages, 5½ x 8 inches; published by National Foremen's Institute Inc., Deep River, Conn., for $1.50.

This booklet has been written especially for supervisors, foremen, department heads and those in business and industry who have men working under their direction and upon whom the Wagner act has imposed certain limitations in their dealings with workers and who also are affected by the wages and hours act and the Walsh-Healey act. It is intended to interpret in simple language those portions of the laws which are of direct interest to them.

Particular attention is paid to the aim of the law to encourage collective bargaining by preventing employers and all management representatives from doing certain things that Congress has designated as unfair labor practices because they are considered to interfere with employes' opportunities to join labor organizations and to be represented by them in negotiations with their employers. Supervisors having full knowledge of penalties for violations need not involve their employers in difficulties by stepping over the line prescribed by the laws.

New Construction Material Offered

■ A new construction material, somewhat like plastic is announced by Designers for Industry Inc. of Ohio, 426 Terminal Tower, Cleveland. Known as Excelite, it is said to be made of materials easy to obtain even with present shortages. Wood wool "excelsior," water, silicate of soda, soy bean protein and quicklime are used to produce the material.

The development may be molded in any density from 4 to 50 pounds per cubic foot, depending on the pressure used, it is said. It can be produced in any form for which a mold may be made and in any thickness from 1/16 to 6 inches. Application for which the material is suited include insulating building boards, doors, sash moldings, gutters, veneer cores, air ducts, stove pipe board liners, refrigerator insulation and truck and bus bodies.

New Product Protects Wood, Concrete Floors

■ Colorflex-Plus, consisting of a cleaner and dye-like coloring is announced by Flexrock Co., Twenty-third and Manning streets, Philadelphia, for conditioning wood and concrete floors by removing dirt, grime and grease. It is said to withstand continuous heavy industrial traffic, preserving the floor through its deep penetration and binding action.

On concrete, the product eliminates sanding, dusting and powdering, preventing development of rough, broken floors. On wood, it protects against splintering, cracking and scarring. It dries quickly and is offered in four colors—tile red, emerald green, battleship gray and linoleum brown.

Serrated Beams

(*Concluded from Page* 88)

shearing the channels to form two symmetric sections, each about two-thirds the depth and one-half the weight of the original channel. The serrated channel is then welded to the plate by a continuous bead running entirely around that portion of the web that contacts the plate. See Fig. 2. This welding is done on a tilting table which permits downhand arc welding as shown in Fig. 1, p. 88.

WHERE TO, SOLDIER?

THEY gave him a pass today, for the week-end.

The world is his—at least as far as the nearest town. No more K.P., no more drill, no more formations till Monday. He can be John American, his own master, having a good time. That pass is his *open sesame.*

But is it?

Where will he and his buddies go in that town overrun with soldiers? Where will they eat and sleep? What can the community do to give them relaxation and entertainment?

• • •

One of the forgotten problems in any high-speed scheme of national defense is how to provide for the soldier and sailor off duty.

Within the camps and naval stations the services themselves have excellent facilities. But in the surrounding cities and towns the problem is acute and difficult.

Many of the newer army camps are located far from the larger centers. Into towns of 1,000 to 5,000 population may come as many as 3,000 men on a single evening. Where are they to go? How is the community to provide for them, to see that they get the wholesome food and entertainment that all of us would like them to have?

To meet this emergency all the "service agencies" of the last war have joined forces. The Y. M. C. A., the National Catholic Community Service, the Salvation Army, the Y. W. C. A., the Jewish Welfare Board and the National Travelers Aid Association have combined to form the United Service Organizations—known as the U. S. O. Differences of race and creed have been forgotten; lesser distinctions have been subordinated to the idea of united service.

How can you help? The U. S. O. is raising approximately eleven million dollars to finance its program of leisure-time aid to the men in service. This is your opportunity to do your bit for national defense. Give generously to the U. S. O.

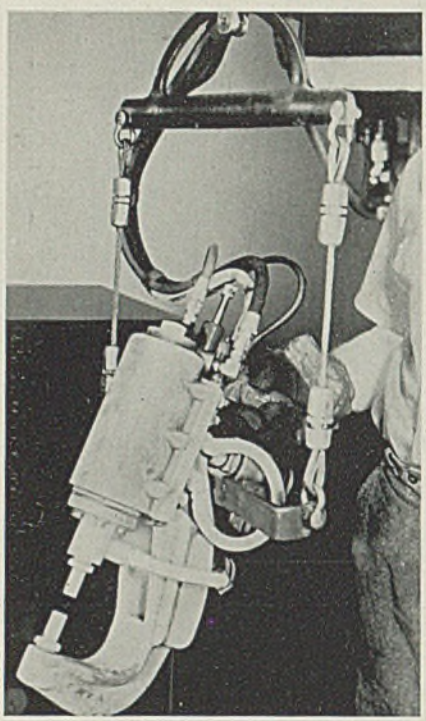
How will the money be used? In maintaining 360 U. S. O. clubs. The government is building the club houses themselves. What is required now is money to operate them.

How and where shall you give? To the local committee that has charge of your city's part in this national drive. No matter how much or how little you feel you can give, send it today to your local chairman or to National U. S. O. Headquarters, Empire State Building, New York.

Industrial Equipment

Portable Welding Gun

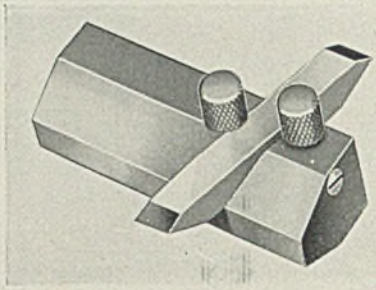
■ Progressive Welder Co., 3050 East Outer drive, Detroit, has developed a portable welding gun for resistance spot welding of aluminum. With its transformer it may be used in combination with virtually any



control equipment used for welding of this metal. The gun has its operating mechanism built into the gun head, which may be supplied with yokes to fit individual needs. Air-operated, employing two differential cylinders in tandem, the gun produces a maximum point pressure of 1200 pounds, when using normal factory airline pressure. It will handle up to two pieces of 0.040-inch thickness. Greater thicknesses may be handled when tack welding. The gun has a maximum stroke of 4 inches, and is designed for the application of refrigeration to the welding tips.

Master Gage

■ Acro Tool & Die Works, 2822 West Montrose avenue, Chicago, announces a new master gage, said to position thread cutting tools at the proper angle while being ground on any type of surface grinder. It consists of a one-piece hardened steel base, milled and slotted to position, and holds thread cutting tools at the proper angles on the grinding surface for standard thread cut-



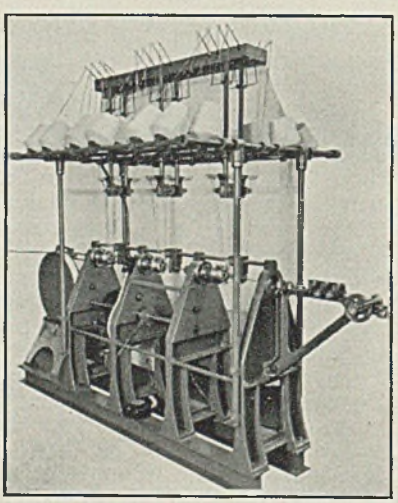
ting operations. The tool bit is held down tightly within the slot by means of two knurled head screws. A set screw takes up any lateral motion which may occur. The gage is said to be fool-proof, enabling anyone to grind thread cutting tools on a surface grinder.

Regulating Valve

■ Hannifin Mfg. Co., 621 South Kolmar avenue, Chicago, has placed on the market an improved air pressure regulating valve which features a piston type construction in place of the conventional diaphragm. It is said to provide a wider opening of the orifice, and affords accurate and sensitive control of reduced pressures. The valve is designed for pressures ranging from 0 to 150 pounds. It is easily accessible for simple maintenance should the replacement of any part become desirable.

Wire Covering Machine

■ Fidelity Machine Co., 3908 Frankford avenue, Philadelphia, has introduced a new Sinfra triple-head wire covering machine for knitting three cotton covers on bare wires consecutively. Driven by a one



horsepower motor, its three knitting heads in series knit three cotton coverings on bare wire up to No. 6 gage at 1200 to 1500 feet per hour. The bare wire is fed over straightening rolls through the three knitting heads consecutively. The covered wire then passes on to a 36-inch capstan take-off. A separate haul-off reel stand with a maximum 40-inch outside diameter, 40-inch traverse and 1000-pound capacity simplifies removal of the finished product. The knitting unit requires a floor space area of only 12 x 4 feet. Added features of the machine include: Automatic stop motion for each yarn; improved knitting head and needle design.

Sweatband

■ American Optical Co., Southbridge, Mass., has placed on the market a new lightweight absorbent sweatband of synthetic sponge for aiding vision of foundrymen, weld-

ers and other workers on hot jobs by keeping perspiration out of their eyes. The sponge is 7½ inches long and covers a generous width of brow. It can be sterilized, used again and again.

Motor Control Units

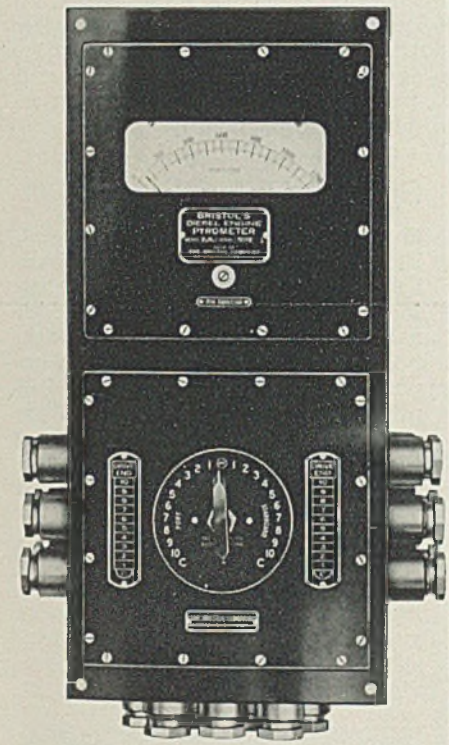
■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announces a standardized control center for motors which not only is adaptable to any combination of motors but also can be changed quickly to suit any new size motor required by production alterations.

The standard line starter and the associated line protective device for any of NEMA sizes 1 to 4 can be slipped into the control unit. A unit is made up of standard sections 20 inches wide by 90 high and 20 deep. The individual control elements are mounted on panels 20 inches wide and some multiple of 14 inches high, so that from two to five control elements can be stacked in a single section. Wiring

is brought in from either top or bottom of the section, and runs vertically in duct behind the control units. Because the control section is 20 inches deep there is sufficient space in it to mount control elements in each side, i.e., back to back, if desired.

Engine Pyrometers

■ Bristol Co., Waterbury, Conn., has developed a new line of diesel engine pyrometers designed especially for battleships, submarines, destroyers, cruisers, sub-chasers, mine sweepers and seaplane-tenders. These are equipped with high-resistance millivoltmeter movements having automatic cold-end compensators. They also are highly damped

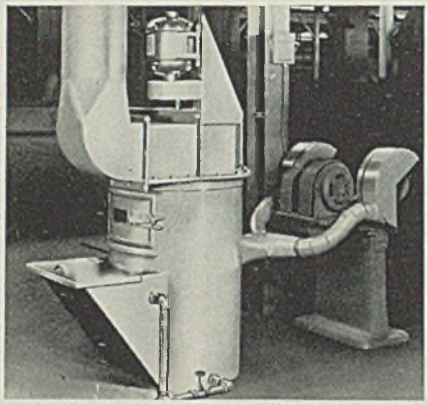


to withstand excessive vibration. The instruments are housed in welded steel, drip-proof cases. Thermocouple switches are of the rotary type with double contacts made of laminated phosphorus bronze. All parts meet latest naval specifications.

Dust Collector

■ Newcomb-David Co., 5741 Russell street, Detroit, has placed on the market a new Uni-Wash water type dust collector for removing dirt, dust, lint, grindings, fumes and vapors from air. It is adaptable to grinding and polishing operations, and also can be used in ventilating explosive ducts and hazardous operations in the finishing of magnesium alloys. The unit occupies little floor space, and it is of welded steel construction. Its

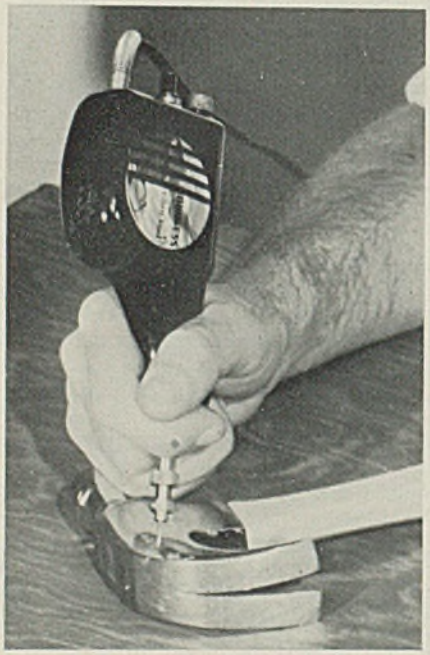
bearings are of the ball bearing cartridge type, ring sealed with Zerk lubricating fittings. Power for the unit is supplied by a motor. An added feature is it is seldom



necessary to add water to the original supply except when the sludge tank is periodically drained for cleaning.

Engraving Tool

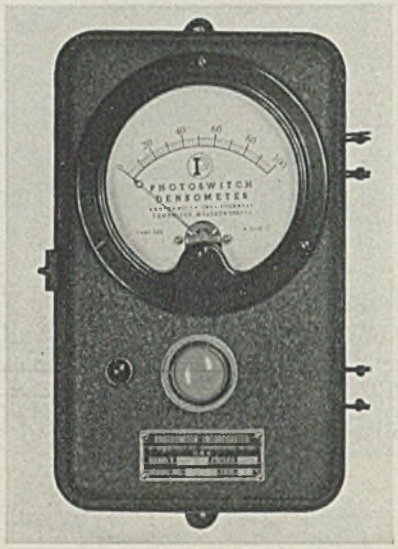
■ Burgess Handicraft Supplies, Division of Burgess Battery Co., 180 North Wabash avenue, Chicago, has introduced a new Vibro-Tool operating on the vibrating principle for engraving, cutting, hammering, or carving on metal, wood, linoleum, sheet rubber, sheet cork, glass, ceramics and other materials. It makes 7200 strokes per minute, with stroke adjustable up to ⅛-inch. The tool's chuck grips a large variety of engraving needles, cutting knives, gages and hammers. Designed for continuous operation, it can be used with jigs or fixtures, to cut or engrave to a templet. Accessories available include fine and coarse needles for engraving, tungsten-tipped needles for cutting or engraving glass and ceramic mate-



rials, knife blades, hammer tips, special cutters and a foot gage for controlling depth of cut.

Smoke Alarm

■ Photoswitch Inc., 21 Chestnut street, Cambridge, Mass., has placed on the market a new type A25C photoelectric smoke alarm for indicating the degree of smoke density passing through the stack and signalling conditions of efficient combustion and excess smoke on green and red signal lights. The equipment includes photoelectric control, light source, and indicator. The first two are mounted on opposite sides of the flue or stack and aligned so that the light beam projects to the eye of the photoelectric control. The design of the lens mount-



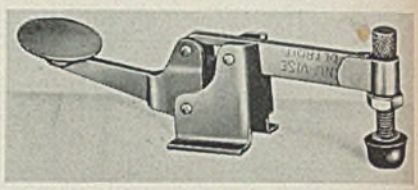
ing minimizes possibility of soot and dust gathering on the lenses. The photoelectric control is wired to Densometer D4 which may be located at any point in the power plant for observation by the engineer. The Densometer gives a continuous indication of the smoke density.

Belt Type Grinder

■ Porter-Cable Machine Co., Syracuse, N. Y., announces a small type G-4 abrasive belt sander-grinder which accommodates a belt 4 inches wide by 45 inches in circumference. It is equipped to handle either dry belts or resin bonded abrasive belts on which water or other coolant is sprayed. A ¾-horsepower, 1725 revolutions per minute, totally enclosed motor, directly connected to the drive pulley of grinder, gives a belt speed of 3400 surface feet per minute. Two hand adjustments simplify the application, removal and alignment of abrasive belts. The cast iron pedestal on which the complete unit is mounted is substantial yet light enough to make the machine readily portable. The slotted rest table of the sander is adjustable up to a 45-degree angle.

Midget Toggle Clamp

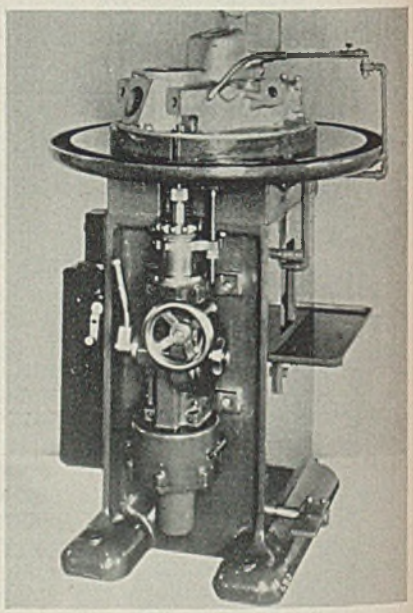
■ Knu-Vise Inc., 16863 Hamilton avenue, Detroit, announces a model No. 830 Midget toggle clamp which because of its small size and great holding strength is said to be ideally



adapted to aircraft work. Furnished complete with spindle and rubber cap, measuring but 4 inches by 1½ inches high it is unique in that it provides a holding pressure in excess of 500 pounds.

Spot Facing Machine

■ Taft-Peirce Mfg. Co., Woonsocket, R. I., has introduced a new back spot facing machine for counterboring or facing bosses through which a hole has been drilled—but which, because of an obstruction, it is impossible to counterbore on a drill press. Part to be machined is mounted on a cast iron table. Near the front of this table is a hole to allow the shank of the inverted counterbore to project through the table. The cutter is driven by a spindle just under the table, the spindle and driving mechanism being driven through bevel gears by a ½-horsepower motor mounted inside the base. Change pulleys provide speeds of 170 revolutions per



minute for steel and 300 revolutions per minute for aluminum alloys.

Helpful Literature

1. Magnetic Pulleys

Stearns Magnetic Manufacturing Co.—13-page bulletin 302 is devoted to magnetic pulleys and magnetic pulley separators. Large cut-away drawing points out important construction features. Four pages of installation photographs depict representative uses. Tables list available sizes.

2. High Pressure Valves

Edwards Valve & Manufacturing Co.—4-page illustrated bulletin No. 12-G5 describes "Intex" valves in socket welding, screwed or flange ends for pressures to 1500 pounds at 950 degrees Fahr. Cross-sectional views show important construction and design details. Sizes range from ⅛ to 2 inches.

3. Metal Finishing

Parks Chemical Co.—4-page bulletin contains information on "Kold Grip" grain cement for attaching abrasive grains to faces of polishing wheels, and on 22 grades of buffing, polishing and rubbing compounds for metal and wood finishing. Latter are listed in tabular form with data on composition and recommended usage.

4. Coal Crushers

McNally Pittsburg Manufacturing Corp.—4-page illustrated bulletin No. 941 is devoted to seven sizes of crushers for reducing nut and egg coal to stoker sizes with minimum production of fines. Tables and line drawings show capacities, sizes and typical flow sheet of crushing circuit.

5. Portable Forges

Hauck Manufacturing Co. — 4-page illustrated bulletin No. 353 catalogs nine models of portable forges for rivet heating, blacksmithing, coppersmithing and brazing. Each model is illustrated and fully described with tabulated specifications.

6. Die Springs

Muehlhausen Spring Corp.—4-page bulletin lists and prices complete range of springs for high speed presses, for regular speed presses, for heavy duty presses and for hand tools and jigs. Spring rod sizes range from ⅝ to 2⅝ inches; capacities from 80 to 3000 pounds.

7. Wood Pulleys

Medart Co.—Illustrated folder, "Save Steel for Defense," explains advantages of wooden pulleys for power transmission applications. Details of engineering service offered are explained.

8. Precision Gages and Tools

Merz Engineering Co.—16-page illustrated bulletin, "Where Precision Transcends Every Other Consideration," explains engineering and production facilities of this company for manufacture of precision parts, gages, jigs and special machine tools. Pictures show operations in various departments.

9. Rust Preventive

Smith Oil & Refining Co.—Illustrated folder announces various grades of "Slushol" rust arresting compounds which may be applied to metal by spraying, brushing or dipping. Samples of steel treated with products are included. Free samples are offered in postcard included with bulletin.

10. Furnace Boilers

Babcock & Wilcox Co.—8-page illustrated bulletin G-34 A describes classes 9, 12 and 15 "Integral-Furnace Boilers." Design, construction and operation are discussed in detail. Line drawings and cut-away photographs show details of typical installation for both coal and oil fired units. Tables list principal dimensions.

11. Universal Motors

Westinghouse Electric & Manufacturing Co.—4-page illustrated leaflet No. B-3004 describes parts for built-in universal motors which are used in drills, screw drivers, shapers, sirens and numerous other applications. General discussion includes motor parts of salient-pole non-compensated and distributed wound compensated types in rating from 1/150 to 1 horsepower, with frame sizes from 00 to 50.

12. Hydraulic Machinery

Watson-Stillman Co.—12-page illustrated bulletin No. 120-A is manual on hydraulic machinery and equipment. Among data included are capacities of hydraulic rams, water discharge rates for circular straight edge orifices, medium carbon seamless steel pipe data, decimal equivalents, circumferences and area of circles, metric conversion tables, strength of materials and hydraulic formulas.

13. Industrial Instruments

Wheelco Instruments Co.—12-page illustrated condensed catalog No. Z5000 gives complete and concise information and list prices of temperature, pressure, proportioning and similar controls and indicating and recording equipment. Such devices as flame controls, pressure instruments, pyrometers, thermometers and thermocouples are covered.

14. Radiant Gas Heat

Selas Co.—12-page illustrated booklet, "Improved Processing" is one of series of bulletins showing application of direct radiant gas heat in metal and metal products industries. Normalizing, special heat treatments, bright annealing, melting and finishing are some of subjects covered.

15. Packaging Data

Hinde & Dauch Paper Co.—12-page illustrated bulletin is No. 1 of series supplying helpful packaging information. Entitled "How To Seal," it points out where and why principles of simplification can be applied to sealing operations. Most efficient methods for sealing with adhesives, gummed tape, staples or stitches, and wires or straps are presented.

16. Surface Grinder

Blanchard Machine Co.—80-page illustrated bulletin No. 211 describes seven models of surface grinders. Detailed data are given on grinding of representative parts such as pump housings, armature punch, reamer blades, timing gears, cylinder heads, cams, lever castings, and cylinder blocks. This information is illustrated with pictures of parts and machine set-ups.

17. Truck Power Plants

Ready-Power Co.—4-page illustrated bulletin No. 93B describes L-2 gasoline driven electric plants which are intended for mounting on 5 to 10-ton truck chassis. Gasoline engine is 6-cylinder unit which develops 30 horsepower at 1000 revolutions per minute. Eight-pole compound wound generator is rated at 9.6 kilowatts.

18. Machine Mountings

Felters Co.—24-page illustrated bulletin is entitled "Unisorb in the Industrial Plant." It includes discussion of noises and vibrations as caused by light and heavy machinery, and how these disturbances can be reduced or eliminated through use of "Unisorb" felt machine mountings. Numerous equipment photographs show applications on diversified equipment.

19. Riggers' Handbook

Broderick & Bascom Rope Co.—96-page illustrated booklet shows latest developments in wire rope slings. All necessary dimensions of fittings are given, as well as working loads under which slings may be used safely. Line drawings tell how to measure slings and depict various types of slings.

STEEL *Readers' Service Dept.*

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20. Crane Controls

Electric Controller & Manufacturing Co.—14-page illustrated bulletin No. 930 describes alternating dynamic lowering and "Contra-Torque" lowering crane controls for hoisting, and magnetic control for bridge and trolley motions. Various features of systems are outlined in text and shown graphically with installation views.

21. Waterproofing

Koppers Co.—4-page illustrated bulletin Form TB-5 is devoted to subject of waterproofing and dampproofing for waterworks. Table tells where to use protective coatings. Detailed instructions are given for protecting roofs, foundations, filter beds, conduits, pipe galleries, clear wells and reservoirs. Two pages tell how treatments are applied.

22. Unit Heaters

Reznor Mfg. Co.—12-page illustrated bulletin U42 describes gas-fired unit heaters in propeller fan, duct and blower types. Cut-away views show design and construction details of each type. Two pages contain data on optional accessory equipment. Several photographs show typical installations.

23. Arc Welder

General Electric Co.—4-page illustrated bulletin GEA-3726 features "Strikeasy" arc welder which was developed especially for fabrication of aircraft tubing and all thin-gage metals. Operating characteristics are dealt with in detail. One section discusses use of welder in handling aircraft tubing. Reproduction of oscillographic measurement reveals welding characteristics.

24. Colloidal Graphite

Acheson Colloids Corp.—4-page technical bulletin No. B260.4 is one of series pertaining to applications of colloidal graphite to industry. This bulletin discusses subject of impregnation of porous bodies with this product. Bibliography is included.

25. Welding Accessories

Safety Clothing & Equipment Co.—6-page illustrated folder, "Welding Protection" describes such welding accessories as gloves, aprons, sleeves and armlets, jackets, overalls, leggings and spats, electrode carrier, welding curtains, cover glass case and electrode holders.

26. Butterfly Valves

R-S Products Corp.—16-page illustrated bulletin No. 10-B features standard and special butterfly valves for control and tight shut-off of gas, air, steam, liquids and semi-solids under high or sub-zero temperatures and varying pressures from 2 to 300 pounds per square inch.

27. Shell Centering

Stokerunit Corp.—Illustrated catalog sheet gives complete information on "Simplex" shell centering machines for 90, 105 and 155-millimeter shell. Machines fit directly into conveyor line, eliminate need for lifting of forgings and are fully automatic in operation.

28. Traveling Cranes

Shaw-Box Crane & Hoist division, Manning, Maxwell & Moore, Inc.—16-page illustrated catalog No. 212 is descriptive of type S electric traveling cranes with roller bearings. Details of various components of complete cranes are shown and features explained.

29. Temperature Control

Brown Instrument Co.—Illustrated bulletin No. 36-4 treats subject of temperature control systems for fuel fired galvanizing kettles. Three types of control adaptable to galvanizing are explained in detail with line drawing and schematic view. Features of each system are discussed.

30. Assembling Presses

Denison Engineering Co.—4-page illustrated bulletin No. P.H.201 explains two ways to get increased production from assembling presses for straightening or bending operations. Features of "Hydr-Ollic" model No. DLAC2 assembling press are explained.

31. Hand Trucks

American Pulley Co.—20-page illustrated bulletin T-41 deals with line of pressed-steel hand trucks, and truck and industrial wheels. Models of trucks are pictured and described for handling general merchandise, kegs and cases, bags, boxes, drums, gas cylinders and other containers.

32. Steel Scaffolding

Mechanical Handling Systems, Inc.—8-page illustrated bulletin No. S-4 on "Quik-Set" safety steel scaffolding gives details of this universal type assembly which may be adapted for practically any condition for maintenance or new construction purposes.

33. Microphotometer

Leeds & Northrup Co.—12-page catalog E-90 (1) describes "Knorr-Albers" microphotometer which uses "Speedomax" recorder in place of conventional galvanometer for making spectrographic analysis. Design, construction and operation are treated extensively.

34. Shell Heat Treatment

Mahr Manufacturing Co.—4-page illustrated bulletin on heat treatment and quench drawing of 75 to 105-millimeter shell shows details of furnace for this purpose in sectional drawing. Information regarding furnace and its application are given.

35. Fume Collectors

Ruemelin Manufacturing Co.—4-page illustrated bulletin No. 37-C is descriptive of line of fume collectors for use in conjunction with welding operations. Details of equipment and typical setups are shown. Also described is portable dust collector.

36. Carbon Tool Steel

Jessop Steel Co.—8-page bulletin 941 sets forth properties and characteristics of "Lion Extra" carbon tool steel which is supplied in any section in standard sizes and tempers. Sections cover typical analysis, heat treatment and hot working, applications, and tool design hints.

37. Electric Motors

Wagner Electric Corp.—36-page illustrated bulletin No. MU-183 gives complete data on single-phase direct current and small polyphase electric motors. Included are descriptions of repulsion-start induction, repulsion-induction, capacitor start, split-phase, direct current, small polyphase, fan and explosion proof motors.

38. Roller Chains and Sprockets

Link-Belt Co.—173-page illustrated data book No. 1757 covers practically all angles of "Silverlink" roller chain and sprocket design and application. In addition, data to aid in selection of drives, details of conveyor chains, and engineering data are presented. Full specifications are included on all types of chains and sprockets.

39. Electric Welder

Lincoln Electric Co.—20-page illustrated bulletin, "The Modern Arc Welding Technique," presents full information on design, applications and features of "Shield-Arc" welders with self-indicating dual continuous control. Features are itemized, shown and explained in detail.

40. Ordnance Finish

Roxalin Flexible Lacquer Co.—1-page sheet is supplement to series of previously published bulletins on commonly used government ordnance finishes. This bulletin lists government specification number, uses, type of thinner, method of application, film thickness and drying properties for "Coronado Tan," finish recommended for equipment operating in desert terrain.

41. Corrosion Resistant Bronze

American Brass Co.—8-page illustrated bulletin, B-16, offers information on general properties and applications of "Tobin" bronze, corrosion resistant alloy consisting of 59-61 per cent copper, ½-1 per cent tin and balance of zinc. Table lists general physical constants, and microphotographs show grain structures.

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Name_____ Title_____

Company_____

Products Manufactured_____

Address_____

City_____ State_____

This card must be completely filled out. Please TYPE or PRINT.

FIRST CLASS
PERMIT No. 36
(Sec. 510 P.L.&R.)
Cleveland, Ohio

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

4c POSTAGE WILL BE PAID BY—

STEEL

Penton Building

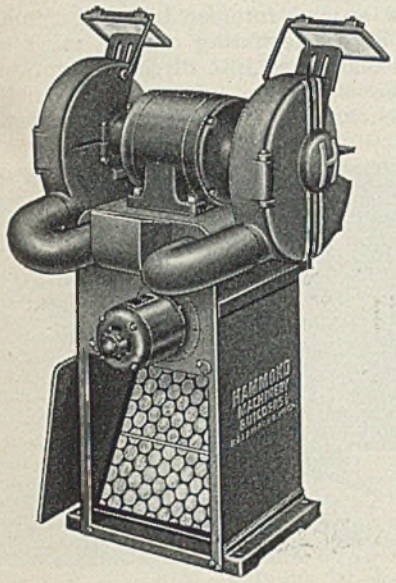
CLEVELAND, OHIO

Readers' Service Dept.

Spindle of the machine is driven by hand. Unit also is equipped with a coolant tank. Pump for the latter is mounted inside the base.

Tool Grinders

■ Hammond Machinery Builders Inc., 1611 Douglas avenue, Kalamazoo, Mich., has introduced three new grinders, the OK-10, 12 and 14 for tool and light snagging grinding. Each of these incorporates a self-contained dust collector mounted inside the base. Three filters of fiber glass also are embodied in each of the units. The filters, in a sliding frame, are easily removed or replaced. A fan of the multi-blade type, the only moving part inside the base, is mounted directly on the fan motor-shaft. The latter is connected with the switch controlling the grinder motor. These grinders are said to require little floor space and may be placed much closer to walls or in line, back to back, with adequate room for filter replacements.



Agitator Jets

■ Heil & Co., 12901 Elmwood avenue, Cleveland, has placed on the market a new E series of steam-air agitator jets for use in pickling tanks. These are said to increase the tonnage speed through the pickling line from 20 to 40 per cent. Advantages obtained from these jets are derived from strategic placement of jet nozzles allowing for complete agitation of the entire bath. The angle of jet impingement is so arranged that a swirling or rolling action of the bath results.

The company is offering a set-up called the E-4 type for batch picklers. These produce agitation and heating up through the bottom of the pack reducing the black pitch rejects; at the same time eliminating the necessity of many hairpin spacers, sand, and other subterfuges for separating the sheets or coils.

The E-12 type agitators are for use in tube picklers, permitting either steam or air to be blown through the tubes. This rapidly removes the ganister, producing more effective pickling internally in a shorter period, with the consequent reduction of the usual overpickling of the outer surface.

Jets are offered in any length or shape. The nozzles are of nonmetallic Nocorodal which is unattacked in boiling acid pickle. The entire construction will withstand corrosive attack of the highest sulphuric acid concentrations developed in modern pickling practice at 220 degrees Fahr.

Diesel Locomotive

■ H. K. Porter Co. Inc., 4975 Harrison street, Pittsburgh, has introduced a new 50-ton diesel electric locomotive for general switching use. Powered with two Cummins diesel engines, each developing 150 horsepower, it has a tractive force of 30,000 pounds at 30 per cent adhesion. Its overall size is 12 feet high by 9 feet 8 inches wide by 29 feet 8 inches long bumper to bumper. Instead of standard forged steel

side rods, each truck on the engine is driven by a heavy duty chain enclosed in oil. This design, intended for use where extreme clearances and sharp curves are encountered, eliminates the overhang of side

rods. Radiators, engines and generators are mounted on heavy steel bedplate designed so that the entire unit, with bedplate, can be removed easily.

Industrial Tubes

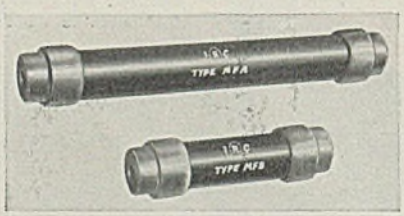
■ Vacuum tube section, radio and television department, General Electric Co., Schenectady, N. Y., has placed on the market three new industrial tubes—a thyratron, a kenotron and a phototube sensitive to blue. The GL-414 thyratron is an all-metal, negative-grid tube for general purpose industrial applications. It is especially suitable for control circuits where the available grid power is very small. It has an indirectly heated cathode rated at 5 volts, 20 amperes. Maximum peak inverse anode voltage is 2000 volts, and average anode current is 12.5 amperes.

The GL-451 kenotron is a half-wave rectifier, rated 30,000 volts peak inverse, 500 milliamperes peak, 100 milliamperes average. Its thoriated tungsten filament makes possible a higher rating for size than when a pure tungsten filament is used. It is especially suitable for use with smoke-precipitation and air-cleaning devices.

The GL-441 phototube is for a high response in the blue region of the spectrum, and has thirty times the quantum efficiency of red sensitive tubes. Sensitivity is 45 microamperes per lumen at an anode voltage of 90.

Sealed Resistors

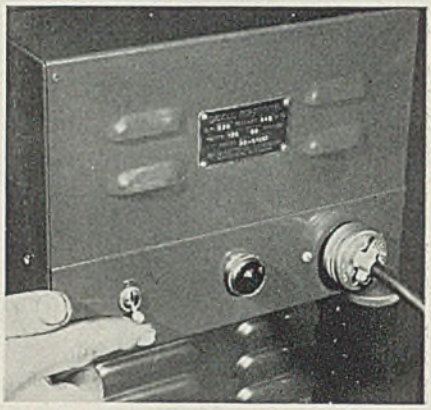
■ International Resistance Co., 401 North Broad street, Philadelphia, is



offering two types of sealed precision voltmeter multiplier resistors for performance under severely humid condition such as those encountered in marine service. Hermetically sealed and encased in a glazed ceramic tube, these multipliers are watertight, being unaffected by the salt immersion test. Type MFA is 8 13/16 inches long and is available in resistance ranges of 3.5, 4.0, 4.5 and 5.0 megohms with corresponding voltage ratings of 3.5, 4.0, 4.5 and 5.0 kilovolts respectively. Type MFB is 4 5/16 inches long, and is available in ranges of 1.0, 1.5, 2.0, 2.5 and 3.0 megohms, with voltages of 1.0, 1.5, 2.0, 2.5 and 3.0 respectively.

Rectifier

■ Savage Tool Co., Savage, Minn., has introduced a new Doall rectifier of special interest to those plants where alternating current must be transformed into direct current for the operation of electro-magnetic chucks. It contains no moving parts,



and is packed in a self-contained 11 x 4¾ x 7¾-inch welded steel case. The rectifier is operated from a toggle switch, a built-in pilot light showing when it is in operation. It is completely fused to prevent damage to either rectifier or magnetic chuck. It will operate any electro-magnetic chuck of from 6 x 18 to 8 x 24 inches in size.

Squaring Shears

■ Niagara Machine & Tool Works, 637 Northland avenue, Buffalo, announces another line of power squaring shears designated as series No. 6 with capacities from 12-gage to 3/16-inch with cutting lengths from 4 to 12 feet.

Features of these units include precision cutting, both as to straightness and parallelism, ball-bearing, self-measuring, parallel back gage with settings to 1/128-inch, speed of 65 strokes per minute, flat, straight shearing of narrow strips. Drives of the machines including flywheel, gearing, clutch, eccentrics and connections, are enclosed and operate in oil.

Running Stoppers

(*Concluded from Page* 64)

of the bottom refractory sleeve should be made parallel with the sleeve axis, as shown in Fig. 1, or should be made upwardly and outwardly tapered, as seen in Fig. 2, so that the stopper rod assembly cannot become anchored in a skull which may form at the bottom of the ladle.

The invention is thought to be particularly advantageous in eliminating the necessity for a pair of stoppers in a ladle.

It has been found in rather extensive operations with the improved stopper rod assembly that considerable actual savings are effected. The necessity for replacement of metal parts in the stopper rod assembly is eliminated. The greatest saving results from the elimination of metal scrap. Further, improved steel quality results from better control of the pouring operation, and improved plant safety results by the elimination of splashing metal.

How To Cut Billions From NonDefense Cost

■ *Curtailment of Nondefense Expenditures,* by Henry P. Seideman; paper, 54 pages, 5½ x 8 inches; published by the Brookings Institution, Washington, for 25 cents.

Taking up nondefense expenditures of the federal government in detail, pointing where retrenchment may be made or where it can not be made without damage to the state, this study concludes that more than two billion dollars can be lopped off. This sum would aid greatly in the war effort and would reduce the burden of taxation considerably.

Perusal of the pages shows by what steps this conclusion has been reached and just where reductions may be made without crippling essential services. One means which has interesting possibilities is transfer of a number of federal expenditures to the several states, most of which are in better situation as to tax receipts than was the case when these services were undertaken by the national administration.

Welding Textbook Gives Practical Instruction

■ *Practical Arc Welding,* by W. J. Chaffee; flexible fabrikoid, 516 pages, 5½ x 8 inches; published by Hobart Trade School Inc., Troy, O., for $2.

With the rapid spread of arc welding in fabrication of war materials, unprecedented demand has arisen for trained welding personnel. Even experienced welders find they must keep abreast of modern procedures and techniques to accomplish successfully the increasing variety of jobs they are called on to perform. This handbook of practical welding has been written to aid in this situation.

Part I is devoted to general welding information, including manufacturing applications, available metals and alloys, joints and welds, electrodes, strength of welded joints, welding symbols and similar matter.

Parts II and III are devoted to a complete series of arc welding lessons as offered in the Hobart school. The 41 lessons cover preliminary instructions, starting and manipulating the arc, welding with bare and coated electrodes, pipe and cast iron welding and specialized applications of arc welding.

Parts IV and V contain a complete dictionary of welding terms and 20 pages of helpful tabular data for operators and designers. An eight-page cross reference index is appended. The material is written in a way to be understood by the beginner and at the same time offers much valuable material for the technical man.

Use of Platinum Metals in Industrial Products Increases Greatly in 1941

■ AT PRESENT, more platinum metals are used in industrial products and equipment than in jewelry, according to Charles Engelhard, president, Baker & Co. Inc., Newark, N. J. In reviewing the industry for 1941, he stated that the outstanding feature of the year has been the rapid growth in industrial use of these metals. And under today's war conditions, the allied nations practically have the world's sources at their disposal, he added.

Prices for these metals, with the exception of iridium, remained practically unchanged during the year. Iridium, quoted at $275 per ounce at the beginning of 1941, dropped to $175 per ounce in February and remained at approximately that figure, according to Mr. Engelhard.

Platinum was quoted from $36 to $38 per ounce throughout the year, against a range of $36 to $40 in 1940. Palladium, at $24 per ounce, has remained stable in price since 1935. Rhodium continued to be quoted at $125 per ounce since 1937, and there has been no change in the price range of $35 to $40 per ounce for ruthenium since 1938.

Regarding industrial uses of these metals, Mr. Engelhard pointed out that platinum is used as a catalyst in producing nitric acid and much of the contact sulphuric acid. These in turn are consumed in large quantities for the manufacture of explosives and other war materials. Palladium is being used increasingly as a catalyst in the hydrogenation of organic compounds and in various other processes.

Glass wool fiber, he said, is made from molten glass which is passed through small orifices in platinum metal alloy feeder dies. These alloys resist oxidation, abrasion and chemical corrosion. They also perform an important function in the production of rayon fiber. In the production of electrochemical products, such as potassium perchlorate and persulphuric acid, platinum is utilized for exposed surfaces of insoluble anodes. Platinum clad metals which comprise a protective layer of platinum bonded to nickel, or other metal, in form of tubing or sheet are being employed in electrochemical processes, and they are being adopted elsewhere in chemical industries for heat exchangers etc.

Electrical contacts of platinum metal alloys are required in modern instruments and equipment used by our fighting forces and in our industrial efforts. Contributing also to the current high production rate of the industry are the numerous thermocouples of platinum or platinum-rhodium alloy used in temperature control and other instruments. Ruthenium-platinum alloys instead of iridium-platinum alloys are being used in jewelry under an OPM order to conserve iridium.

Blackout Paint

■ A blackout paint for plant windows which meets requirements of the Office of Civilian Defense is announced by Sherwin-Williams Co., Cleveland. Known as S-W Blackout Black, it is said to give excellent results in opacity, weather resistance and nonreflective properties when used either inside or outside of the glass.

Either a brush or sprayer may be used to apply the paint. When using the latter, the paint must first be thinned. The finish coat of the paint dries to a dull finish which prevents exterior lights reflecting on large window areas, it is claimed.

Wider War Production Swells Steel Demand

Production plans not yet affected by WPB. Industry making best speed possible. Scrap continues greatest bar to full operation

MARKET IN TABLOID ★

Demand
War buying on increase.

Prices
Ceilings well observed.

Production
Up 1 point to 97 per cent.

■ TRANSITION from peacetime production to manufacture of war material is gaining speed and is reflected in increasing demand for steel of all descriptions for the latter purpose. For several weeks, since about the turn of the year, general demand was light but as more plants have obtained war contracts and have retooled for new lines orders with high priority are increasing rapidly.

Momentum of war buying is so heavy that reorganization of government control agencies under the War Production Board has proceeded thus far without effect on steel demand, which has reflected no hesitation because of expected changes. Many observers believe there will be no marked change in the general organization of the Iron and Steel Branch and that the principal influence of the new plan will be an acceleration of the trend toward broader allocation and concentration of production on war work, accompanied by sharper appraisal of essential civilian requirements.

Due to the announced policy of shifting industry in general over to an all-out war effort as quickly as possible companies engaged on purely commercial work are pushing harder than ever for rearmament work. In the meantime deliveries of all major steel products are becoming tighter. Even in other products than plates and bars, which are most in demand, most mills offer little hope of shipping much tonnage in the lower priority brackets or in non-rated tonnage. Many producers make no promises of delivery in spite of heavy pressure. Expected increase in freight rates is a factor in this pressure.

Placing of 402 cargo ships with builders on the Pacific Coast will require a heavy tonnage of plates and shapes, which is expected to be allocated among mills in that area. The ships have been awarded to yards in California, Oregon and Washington.

Scrap scarcity has not been relieved sufficiently to allow resumption of steel production in idle open hearths in condition to operate. Except in a few cases steel plants are operating on a narrow margin of shipments from day to day with no assurance of continuance. Numerous campaigns are under way in cities and rural districts looking to discovery and utilization of obsolescent material and some method is being sought to obtain the potential scrap existing in automobile wrecking yards. The latter is considered the most promising source of large tonnage. Collection and preparation had been interrupted by snow and cold but the current generally mild weather has aided collectors for the most part. Inspectors detailed by OPM to prevent upgrading constitute a threat to this form of price evasion but efficacy of their efforts remains to be proven.

Slightly better scrap supply at several steelmaking centers caused an advance of 1 point in the national production rate, to 97 per cent. Chicago increased 1 point to 102 per cent, Eastern Pennsylvania 1 point to 90 per cent, Cleveland 4½ toints to 94½, Detroit 6 points to 92 and Youngstown 2 points to 86. New England dropped 15 points to 85 per cent, Wheeling 1 point to 88, Cincinnati 3½ points to 88 and St. Louis 5 points to 76. Previous rates were maintained at Pittsburgh, 95 per cent; Buffalo, 79½ per cent and Birmingham, 90 per cent.

Regulation of the steel warehouse trade by OPA has been met by numerous objections on the part of the industry. Delicate adjustments worked out by years of experience have been thrown out of gear and Administrator Henderson has been asked to permit a conference in which the points at issue can be explained and discussed. Meanwhile trading is slow in the face of strong demand, both because of broken stocks and lack of clear knowledge of provisions of the price-fixing order.

OPA has established maximum price on maintenance grades of dead-burned magnesite, at the level prevailing the past three years and will follow this by an order covering other grades and basic refractory brick, whether containing magnesium or any combination.

Automobile builders assembled 79,930 units last week, an increase of 4905 over 75,025 in the previous week. This compares with 121,948 in the corresponding week last year. The industry is close to the quota set for January production.

Price composites continue as for months past, held steady by government regulations. Finished steel composite is $56.73; semifinished steel $36; steelmaking pig iron $23.05; steelmaking scrap $19.17.

COMPOSITE MARKET AVERAGES

	Jan. 24	Jan. 17	Jan. 10	One Month Ago Dec., 1941	Three Months Ago Oct., 1941	One Year Ago Jan., 1941	Five Years Ago Jan., 1937
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$55.18
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	36.20
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	22.80	19.96
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	21.00	18.45

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

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

Finished Material

	Jan. 24, 1942	Dec. 1941	Oct. 1941	Jan. 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.17
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
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
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅜-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	Jan. 24, 1942	Dec. 1941	Oct. 1941	Jan. 1941
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.34	25.34	25.34	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	19.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	23.06
No. 2X, del. Phila. (differ. av.)	26.215	26.215	26.215	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.34	31.34	31.34	30.34
Gray forge, del. Pittsburgh	.24.19	24.19	24.19	24.17
Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$22.15
Heavy melt. steel, No. 2, E. Pa.	17.75	17.87	17.75	19.31
Heavy melting steel, Chicago	18.75	18.75	18.75	20.15
Rails for rolling, Chicago	22.25	22.25	22.25	24.40
No. 1 cast, Chicago	20.00	21.33	21.50	19.35

Coke

Connellsville, furnace, ovens	$6.25	$6.25	$6.25	$5.50
Connellsville, foundry, ovens	7.25	7.25	7.25	6.00
Chicago, by-product fdry., del.	12.25	12.25	12.25	11.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

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

Sheets, Strip

Hot-Rolled Sheets

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 2.10c
Granite City base 2.20c
Detroit, del. 2.20c
Pacific ports 2.65c

Cold-Rolled Sheets

Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, B'ham., base.. 3.05c
Granite City, base..... 3.15c
Detroit, del. 3.15c
Other Mich. pts., del..... 2.25c
Pacific ports 3.70c

Galvanized Sheets, No. 24

Pittsburgh, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c
Granite City, base..... 3.60c
Pacific ports 4.05c

Corrugated Galv. Sheets

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, 29 gage, per square 3.31c
Granite City 3.38c
Pacific Ports 3.73c

Culvert Sheets

Pittsburgh, Gary, Birmingham, 16-gage, not corrugated, copper steel 3.60c, copper iron 3.90c, pure iron 3.95c.
Pittsburgh, 24-gage, zinc-coated, hot-dipped, heat-treated 4.25c.
Granite City, copper steel 3.70c, copper iron 4.00c, pure iron 4.05c.
Pacific ports, copper steel 4.25c, copper iron 4.55c, pure iron 4.60c.

Enameling Sheets

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage, base 2.75c
Granite City, base 2.85c
Pacific ports 3.40c
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c
Granite City, base 3.45c
Pacific ports 4.00c

Electrical Sheets, No. 24

	Pittsburgh Base	Pacific Ports	Granite City
Field gr.	3.20c	3.95c	3.30c
Armat.	3.55c	4.30c	3.65c
Elect.	4.05c	4.80c	4.15c
Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	.....
65	7.15c	7.90c	.....
58	7.65c	8.40c	.....
52	8.45c	9.20c	.....

Hot-Rolled Strip

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c
Detroit, del. 2.20c
Other Mich. pts. del..... 2.25c
Pacific ports 2.75c

Cold-Rolled Strip

Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c
Chicago, base 2.90c
Worcester, base 3.00c
Detroit, del. 2.90c
Other Mich. pts. del..... 2.95c

Commodity C.R. Strip

Pittsburgh, Cleveland, Youngstown, base 3 tons and over 2.95c
Worcester, base 3.35c
Detroit, del. 3.05c
Other Mich. pts. del..... 3.10c

Cold-Finished Spring Steel

Pittsburgh, Cleveland, base; add 20 cents for Worcester.
.26-.50 Carbon 2.80c
.51-.75 Carbon 4.30c
.76-1.00 Carbon 6.15c
Over 1.00 Carbon..... 8.35c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

TYPE	BARS	PLATES	H. R. SHEETS	H. R. STRIP	C. R. STRIP
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
304-20% clad	. .	*18.00	19.00	. .	. .
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
316	40.00	44.00	48.00	40.00	48.00
317	50.00	54.00	58.00	50.00	58.00
347	33.00	38.00	45.00	33.00	42.00
403	21.50	24.50	29.50	21.25	27.00
410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
430F	19.50	22.50	29.50	18.75	24.50
431	19.00	22.00	29.00	17.50	22.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00

*Includes annealing and pickling.

Tin, Terne Plate

Tin Plate

Pittsburgh, Chicago, Gary, 100-lb. base box..... $5.00
Granite City $5.10

Tin Mill Black Plate

Pittsburgh, Chicago, Gary, base 29 gage and lighter 3.05c
Granite City 3.15c
Pacific ports, boxed 4.05c

Long Ternes

Pittsburgh, Gary No. 24 unassorted 3.80c
Pacific Ports 4.55c

Special Coated Mfg. Ternes

Pittsburgh, Chicago, Gary, 100-base box $4.30
Granite City $4.40

Roofing Ternes

Pittsburgh base per package 112 sheets 20 x 28 in., coating I.C.

8-lb.	$12.00	25-lb.	$16.00
15-lb.	14.00	30-lb.	17.25
20-lb.	15.00	40-lb.	19.50

Steel Plate

Pittsburgh, Chicago, Gary, Cleveland, Birmingham,

Youngstown 2.10c
Coatesville, Sparrows Point, Claymont 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, Bethlehem, Chicago, Buffalo, Birmingham 2.10c
St. Louis, del. 2.34c
Pacific Coast ports 2.75c

Bars

Hot-Rolled Carbon Bars

Pittsburgh, Chicago, Gary, Cleve., Birm., base 20 tons one size 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Duluth, base 2.25c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Rail Steel Bars

Pitts., Chicago, Gary, Cleveland, Birm., base 5 tons 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Hot-Rolled Alloy Bars

Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size 2.70c
Detroit 2.80c

Alloy S.A.E.	Diff.	Alloy 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 .15-25 Mo.			0.55
4600 0.20-0.30 Mo.; 1.50-2.00 Ni.			1.20
5100 80-1.10 Cr.			0.45
5100 Spr. flats			0.15
6100 Bars			1.20
6100 Spr. flats			0.85
Carb., Van.			0.85
9200 Spr. flats			0.15
9200 Spr. rounds, squares			0.40
T 1300, Mn, mean 1.51-2.00			0.10
Do., carbon under 0.20 max.			0.35

Cold-Finished Carbon Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs. 2.65c
Detroit 2.70c

Cold-Finished Alloy Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 3.35c
Detroit 3.45c
Galveston, add $0.25; Pacific Coast, $0.50.

Turned, Ground Shafting

Pitts., Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c
Detroit 2.70c

Reinforcing Bars (*New Billet*)

Pitts., Chicago, Gary, Cleveland, Birm., Sparrows Point, Buffalo, Youngstown, base 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Reinforcing Bars (*Rail Steel*)

Pitts., Chicago, Gary, Cleveland, Birm., base. 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Iron Bars

Philadelphia, com. del. 3.06-3.50c
Pittsburgh, muck bar.... 5.00c
Pittsburgh, staybolt 8.00c
Terre Haute com., f.o.b. mill 2.15c

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)... 59
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 at Birmingham)

Bright bess., basic wire.. 2.60c
Galvanized wire 2.60c
Spring wire 3.20c
Worcester, Mass., 10c higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh, keg. $3.85

Alloy Plates (Hot)

Pitts., Chicago, Coatesville, Pa. 3.50c

Rails, Fastenings

(*Gross Tons*)

Standard rails, mill $40.00
Relay rails, base, 35 lbs. and over 28.00-30.00
Light rails, billet qual., Pitts., Chicago, Bham. $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 4.75c
Do., heat treated 5.00c
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.....65½ off
Do., ⅝ and ¾ x 6-in. and shorter .....63½ off
Do., ¾ to 1 x 6-in. and shorter .....61 off
1⅛ and larger, all lengths 59 off
All diameters, over 6-in. long .....59 off
Tire bolts .....50 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts ..... 56 off
Plow bolts .....65 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less.	62	64
⅝-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger..	56	..

Hexagon Cap Screws

Upset 1-in., smaller .....60 off

Square Head Set Screws

Upset, 1-in., smaller.....68 off
Headless, ¼-in., larger..55 off
No. 10, smaller .....60 off

Piling

Pitts., Chgo., Buffalo.... 2.40c

Rivets, Washers

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

Structural 3.75c
⅛-inch and under.....65-5 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. .....$3.50 off

Tool Steels

Pittsburgh, Bethlehem, Syracuse, base, cents per lb.

Carb. Reg. 14.00 Oil-hardening .. 24.00
Carb. Ext. 18.00
Carb. Spec. 22.00 High car.-chr. 43.00

High Speed Tool Steels

Tung.	Chr.	Van.	Moly.	
18.00	4	1	....	67.00
18.00	4	2	1	77.00
18.00	4	3	1	87.00
1.50	4	1	8.50	54.00
....	4	2	8	54.00
5.50	4	1.50	4	57.50
5.50	4.50	4	4.50	70.00

Boiler Tubes

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

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	.....
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	$ 7.82	$ 9.01
1¼" O.D.	13	9.26	10.67
1½" O.D.	13	10.23	11.79
1¾" O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼" O.D.	13	14.54	16.76
2¼" O.D.	12	16.01	18.45
2½" O.D.	12	17.54	20.21
2¾" O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Welded Iron, Steel, Pipe

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

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	51
¾	66½	55
1—3	68½	57½

Iron

¾	30	10
1—1¼	34	16
1½	38	18½
2	37½	18

Lap Weld

Steel

2	61	49½
2½—3	64	52½
3½—6	66	54½
7 and 8	65	52½

Iron

2	30½	12
2½—3½	31½	14½
4	33½	18
4½—8	32½	17
9—12	28½	12

Line Pipe, Plain Ends

Steel

1 to 3, butt weld 68½
2, lap weld 63
2½ to 3, lap weld..... 66
3½ to 6, lap weld..... 65
7 and 8, lap weld..... 64
Seamless, 3 pts. lower discount.

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm..$45.00-46.00
4-in., Birmingham.. 48.00-49.00
4-in., Chicago 56.80-57.80
6-in. & over, Chicago 53.80-54.80
6-in. & over, east fdy. 49.00
Do., 4-in. 52.00
Class A Pipe $3 over Class B
Stnd. fittgs., 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 ⅜-inch incl. (per 100 lbs.) $2.00
Do., over ⅜ to 47/64-in. incl. 2.15
Worcester up $0.10, Galveston up $0.25 and Pacific Coast up $0.50 on water shipments.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt. 1.90c

Shell Steel

Pittsburgh, Chicago, base, 1000 tons of one size, open hearth

3-12-inch $52.00
12-18-inch 54.00
18-inch and over 56.00

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.... $6.00- 6.25
Connellsville, fdry.. 7.00- 7.50
Connell. prem. fdry. 7.25- 7.60
New River fdry. .. 8.00- 8.25
Wise county fdry. .. 7.50
Wise county fur. .. 6.50

By-Product Foundry

Newark, N. J., del.. 12.60-13.05
Chicago, outside del. 11.50
Chicago, delivered .. 12.25
Terre Haute, del. .. 12.00
Milwaukee, ovens... 12.25
New England, del. .. 13.75
St. Louis, del. 12.02
Birmingham, ovens. 8.50
Indianapolis, del. .. 12.00
Cincinnati, del. 11.75
Cleveland, del. 12.30
Buffalo, del. 12.50
Detroit, del. 12.25
Philadelphia, del. .. 12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol.... 15.00c
Toluol, two degree 28.00c
Solvent naphtha 27.00c
Industrial xylol 27.00c

Per lb. f.o.b. works

Phenol (car lots, returnable drums) 12.50c
Do less than car lots.. 13.25c
Do tank cars 11.50c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers 8.00c

Per ton, bulk, f.o.b. port

Sulphate of ammonia $29.00

Pig Iron

No. 2 foundry is 1.75-2.25 sil.; 50c diff. for each 0.25 sil. above 2.25 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birmingham, Ala.§	20.38	. . .	19.38	25.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	. . .	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.00	25.50	24.50	26.00
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	. . .
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	. .	. .	. . . .
Sharpsville, Pa.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00
Sparrow's Point, Md.	25.00	. .	24.50	. . .
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00

§Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.39	25.39
Baltimore from Birmingham†	25.61	. . . .	25.11	. . . .
Boston from Birmingham†	25.12	. . . .	. . . .	. . . .
Boston from Everett, Mass.	25.50	26.00	25.00	26.50
Boston from Buffalo	25.50	26.00	25.00	26.50
Brooklyn, N. Y., from Bethlehem	27.50	28.00	. .	. . .
Canton, O. from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	. . .	. . .	. . . .
Cincinnati from Hamilton, O.	24.44	25.11	24.61	. . . .
Cincinnati from Birmingham†	24.06	. . . .	23.06	. . . .
Cleveland from Birmingham†	24.12	. . . .	23.12	. . . .
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	. . .
Milwaukee from Chicago	25.10	25.10	24.60	25.60
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	. . . .	. . . .
Newark, N. J., from Birmingham†	26.15	. . .	. . . .	. . . .
Newark, N. J., from Bethlehem	26.53	27.03	. . . .	. . . .
Philadelphia from Birmingham†	25.46	. . . .	24.96	. . . .
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	. . .

Pittsburgh dist.: Add to Neville Island base, North and South Sides, 69c; McKees Rocks, 55c; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, 84c; Monessen, Monongahela City, $1.07; Oakmont, Verona, $1.11; Brackenridge, $1.24.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Saginaw, Mich., from Detroit	26.31	26.31	25.81	26.81
St. Louis, northern	24.50	24.50	24.00	. . . .
St. Louis from Birmingham	†24.50	. . . .	23.62	. . . .
St. Paul from Duluth	26.63	26.63	. . . .	27.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50 base; $30.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$28.00
Pitts. dist. fur.	23.50	do., del. Chicago	31.34
		Lyles, Tenn., high phos.	28.50

Silvery

Jackson county, O., base, 6.00 to 6.50 per cent $29.50. Add 50 cents for each additional 0.25 per cent of silicon. Buffalo base $1.25 higher.

Bessemer Ferrosilicon†

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

Manganese differentials in silvery iron and ferrosilicon not to exceed 50 cents per 0.50 per cent manganese in excess of 1 per cent.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	38.00
New Jersey	49.00

Ohio

First quality	43.00
Intermediate	36.10
Second quality	36.00

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$31.00
Wire cut	29.00

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

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

Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, duty pd., tide, net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$25.00
Do., barge	25.00
No. 2 lump	25.00

Ferroalloy Prices

Ferromanganese, 78-82%, Carlots, duty pd., seab'd. $120.00
Carlots, del. Pittsburgh 125.33
Carlots, f.o.b. So. f'ces. 140.00
Add $10 for ton, $13.50 for less ton, $18 for less than 200-lb. lots.

Spiegeleisen, 19-21%, gross ton, Palmerton $36.00

Manganese Briquets, Contract carloads, bulk freight allowed, per lb. 5.50c
Packed 5.75c
Ton lots 6.00c
Less-ton lots 6.25c
Less 200-lb. lots 6.50c
Spot ¼c higher.

Manganese Electro, 99.9+%, less car lots 42.00c

Chromium Metal, per lb. contained chromium

	Contract	Spot
98% Cr. ton lots	80.00c	85.00c
88% Cr. ton lots	79.00c	84.00c

Ferrocolumbium, 50-60% f.o.b. Niagara Falls, per lb. contained Cb on contract $2.25
Less-ton lots 2.30
(Spot 10c higher)

Chromium Briquets, per lb., freight allowed

	Contract	Spot
Carlots	8.25c	8.50c
Packed	8.50c	8.75c
Ton lots	8.75c	9.00c
Less-ton lots	9.00c	9.25c
Less 200 lbs.	9.25c	9.50c

Ferrochrome, 66-70%, freight allowed, 4-6% carbon, per pound contained (chrome)
Carloads 13.00c
Ton lots 13.75c
Less-ton lots 14.00c
Less than 200-lb. lots 14.25c

67-72%, low carbon, cts. per pound:

	Car loads	Ton lots	Less ton	Less 200 lbs.
2% C.	19.50	20.25	20.75	21.00
1% C.	20.50	21.25	21.75	22.00
0.20% C.	21.50	22.25	22.75	23.00
0.10% C.	22.50	23.25	23.75	24.00

Spot is ¼c higher.

Ferromolybdenum, 55-75%, per lb. contained molybdenum, f.o.b. furnace 95.00c

Calcium Molybdate (Molyte), 40-45% Mo., per lb. contracts, f.o.b. producers plant 80.00c

Molybdic Oxide Briquets, 48-52% Mo. per lb. contained, f.o.b. producers plant 30.00c

Molybdenum Oxide, (In 5 and 20 lb. mo. contained cans) 53-63 mo. per lb. contained f.o.b. producers' plants 80.00c

Molybdenum Powder, 99%, f.o.b. York, Pa., per lb. in 200-lb. kegs $2.60
Do., 100-200 lb. lots 2.75
Do., under 100-lb. lots 3.00

Ferrophosphorus, 17-19%, gross ton carloads, f.o.b. sellers' works, $3 unitage, freight equalized with Rockdale, Tenn. for 18% phos.
Contract $58.50
Spot 62.25
23-26%, $3 unitage, freight equalized with Mt. Pleasant, Tenn., for 24% phos.
Contract 75.00
Spot 80.00

Ferrosilicon, Gross tons, freight allowed, bulk

	Carloads	Ton lots
50%	$ 74.50	$87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

(Above for contracts; spot ¼c higher)

Silicon Metal, Spot ¼-cent higher (Per Lb., Contracts):

	1% Iron	2% Iron
Carlots	14.50c	13.00c
Ton lots	15.00c	13.50c
Less-ton lots	15.25c	13.75c
Less 200 lbs.	15.50c	14.00c

Silicon Briquets, Contract carloads, bulk freight allowed, per ton $74.50
Packed 80.50
Ton lots 84.50
Less-ton lots, per lb. 4.00c
Less 200-lb. lots 4.25c
Spot ¼c higher on less ton lots; $5 higher on ton lots and over.

Silicomanganese,

Carbon	1½%	2½%
Carloads (contract)	$128.00	$118.00
Ton Lots (contract)	140.50	130.50

Freight allowed spot $5 above contract

Ferrotungsten, (All prices nominal) Carlots, per lb. contained tungsten $1.90

Tungsten Metal Powder, (Prices Nominal) 98-99 per cent, per pound, depending upon quantity $2.60-$2.65

Ferrotitanium, 40-45%, f.o.b. Niagara Falls, per lb. contained in ton lots $1.23
Less ton lots 1.25
20-25%, C. 0.10 max., in ton lots per lb. contained Ti 1.35
Less-ton lots 1.40
(Spot 5c higher)

Ferro-Carbon-Titanium, 15-20% Titanium,

	6-8% C	3-5% C
Carlots, contract, f.o.b. Niagara Falls, freight allowed to destinations east of Mississippi and north of Baltimore and St. Louis	$142.50	$157.50

Ferrovanadium, 35-40%, contract per pound contained vanadium $2.70-$2.80-$2.90
(Spot 10c higher)

Vanadium Pentoxide, Per lb. contained, contracts $1.10
Do., spot 1.15

Zirconium Alloy, 12-15%, carloads, contract, bulk $102.50
Packed 107.50
Ton lots 108.00
Less ton lots 112.50
Spot $5 a ton higher

Alsifer, 35-40%, contract, carloads, bulk or package, per lb. alloy 14.00c
Do., ton lots 15.00c
Do., less-ton lots 16.00c
Spot is ¼-cent higher

Alsifer, Per lb., f.o.b. Niagara Falls.

Contract	Spot
Carlots 7.50c	8.00c
Ton lots 8.00c	8.50c

Simanal, Per lb. of alloy, contracts, freight allowed (approx. 20% Si, 20% Mn, 20% Al)

Carlots	Ton Lots	Less Ton Lots
10.50c	11.00c	11.50c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1941

As Kansas City, Mo., Chattanooga, Tenn., Tulsa, Okla., and Portland, Oreg., were not named in the order fixing ceiling prices they have been omitted below.

	Soft Bars	Hot-rolled Strip Bands	Hot-rolled Strip Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars Carbon	Cold Drawn Bars S.A.E. 2300	Cold Drawn Bars S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.48	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	4.65	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	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.42	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.00	4.92	3.47	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	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	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	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.	3.75	5.95	5.95	3.85	3.85	5.50	4.20	....	5.25	....	6.90	....	....
Seattle	4.35	4.35	....	4.35	4.35	5.35	4.35	7.70	5.60	....	5.75	....	....
Los Angeles	4.50	5.00	6.80	4.50	4.50	6.75	4.65	6.50	5.85	....	6.60	10.55	9.55
San Francisco	4.10	4.60	6.35	4.25	4.25	5.95	4.25	6.40	6.00	....	6.80	10.80	9.80

	S.A.E. Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	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	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	....	8.75	9.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	5.60	9.80	8.80	8.65	9.05

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; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities; 300-1999 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; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 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; 750-4999 in San Francisco.

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.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	£ s d
Merchant bars, 3-inch and over	$66.50	16 10 0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0
Structural shapes	2.95c	15 10 0
Ship plates	2.90c	16 2 6
Boiler plates	3.17c	17 12 6
Sheets, black, 24 gage	4.00c	22 5 0
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1 10 9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

	£ s d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$25.79	6 8 0(a)
Basic pig iron	24.28	6 0 6(a)
Furnace coke, f.o.t. ovens	7.40	1 16 9
Billets, basic soft, 100-ton lots and over	49.37	12 5 0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14 10 6
Merchant bars, rounds and squares, under 3-inch	3.17c	17 12 0††
Shapes	2.77c	15 8 0††
Ship plates	2.91c	16 3 0††
Boiler plates	3.06c	17 0 6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22 15 0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26 2 6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23 15 0
Bands and strips, hot-rolled	3.30c	18 7 0

(a) del. Middlesbrough 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents. unit, del. E. Pa.

Foundry and basic 56-63%, contract	12.00

Foreign Ore

Cents per unit, c.i.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.	$24.00
Brazil iron ore, 68-69% ord.	7.50c
Low phos. (.02 max.) F.O.B. Rio Janeiro.	8.00c
Scheelite, lmp.	23.50-24.00

Chrome Ore

Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African, 2.8:1 lump, 48%	$39.00
South African (excluding war risk) No ratio lump, 44%	28.00
Do. 45%	29.00
Do. 48%	34.00
Do. concentrates, 48%	33.00
Do. 50%	34.00
Brazilian 2.5:1 lump, 44%	31.00
2.8:1 lump, 44%	32.50
3:1 lump, 48%	41.00
Do. concentrate, 48%	33.00
Philippine No ratio lump, 45%	32.00
2.8:1 lump, 48%	40.00
Do., concentrate, 48%	39.00
2.5:1 concentrate, 48%	36.50
No ratio concentrate	34.00
No ratio lump, 48%	35.00
Rhodesian	nominal

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	
So. African, 50%	68.00-70.00
Indian, 50%	68.00-70.00
Brazilian, 46%	68.00-70.00
Chilean, 47%	68.00-70.00
Cuban, 50-51%, duty free	

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

(Gross Tons)

OTHER THAN RAILROAD GRADES	*Pittsburgh	Johnstown, Pa. Sharon, Canton, O.	Steubenville	Youngstown	Warren	Weirton	Cleveland	Cincinnati	Middletown	Portsmouth	Ashland, Ky.	Buffalo	Claymont, Del.	Coatesville	Conshohocken, Pa.	Harrisburg	Phoenixville, Pa.
Open Hearth	20.00	20.00	20.00	20.00	20.00	20.00	19.50	19.50	19.50	19.50	19.50	19.25	18.75	18.75	18.75	18.75	18.75
Machine Shop Turnings	16.00	16.00	16.00	16.00	16.00	16.00	15.50	15.50	15.50	15.50	15.50	15.25	14.75	14.75	14.75	14.75	14.75
Blast Furnace	16.00	16.00	16.00	16.00	16.00	16.00	15.50	15.50	15.50	15.50	15.50	15.25	14.75	14.75	14.75	14.75	14.75
Elec. furnace and foundry																	
Low phos billet, bloom, forge crops	25.00	25.00	25.00	25.00	25.00	25.00	24.50	24.50	24.50	24.50	24.50	24.25	23.75	23.75	23.75	23.75	23.75
Low phos bar crops and smaller	22.50	22.50	22.50	22.50	22.50	22.50	22.00	22.00	22.00	22.00	22.00	21.75	21.25	21.25	21.25	21.25	21.25
Low phos punchings and plate scrap	22.50	22.50	22.50	22.50	22.50	22.50	22.00	22.00	22.00	22.00	22.00	21.75	21.25	21.25	21.25	21.25	21.25
Heavy cut structural, plate, 3 feet, under	21.00	21.00	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.50	20.25	19.75	19.75	19.75	19.75	19.75
Heavy cut structural, plate, 2 feet, under	21.50	21.50	21.50	21.50	21.50	21.50	21.00	21.00	21.00	21.00	21.00	20.75	20.25	20.25	20.25	20.25	20.25
Heavy cut structural, plate, 1 foot, under	22.00	22.00	22.00	22.00	22.00	22.00	21.50	21.50	21.50	21.50	21.50	21.25	20.75	20.75	20.75	20.75	20.75
Cut automotive steel scrap, 3 feet, under	20.00	20.00	20.00	20.00	20.00	20.00	19.50	19.50	19.50	19.50	19.50	19.25	18.75	18.75	18.75	18.75	18.75
Cut automotive steel scrap, 2 feet, under	20.00	20.00	20.50	20.50	20.50	20.50	20.00	20.00	20.00	20.00	20.00	19.75	19.25	19.25	19.25	19.25	19.25
Cut automotive steel scrap, 1 foot, under	21.00	21.00	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.50	20.20	19.75	19.75	19.75	19.75	19.75
Alloy free low phos, sulphur turnings	18.00	18.00	18.00	18.00	18.00	18.00	17.50	17.50	17.50	17.50	17.50	17.25	16.75	16.75	16.75	16.75	16.75
First cut heavy axle and forge turnings	19.50	19.50	19.50	19.50	19.50	19.50	19.00	19.00	19.00	19.00	19.00	18.75	18.25	18.25	18.25	18.25	18.25
Electric furnace bundles	21.00	21.00	21.00	21.00	21.00	21.00	20.50	20.50	20.50	20.50	20.50	20.25	19.75	19.75	19.75	19.75	19.75

	Sparrows Point, Md.	Chicago	Bethlehem	Kokomo	Duluth	Detroit	Toledo	St. Louis	Atlanta	Alabama City	Birmingham	Los Angeles	Pittsburg, Calif.	San Francisco	Minnequa, Colo.	Seattle	Portland
Open Hearth	18.75	18.75	18.25	18.25	18.00	17.85	.....	17.50	17.00	17.00	17.00	17.00	17.00	17.00	16.50	14.50	.....
Machine Shop Turnings	14.75	14.75	14.25	14.25	14.00	13.85	13.85	13.50	13.00	13.00	13.00	13.00	13.00	13.00	12.50	10.50	.....
Blast Furnace	14.75	14.75	14.25	14.25	14.00	13.85	13.85	13.50	13.00	13.00	13.00	13.00	13.00	13.00	12.50	10.50	.....
Elec. furnace and foundry																	
Low phos billet, bloom, forge crops	23.75	23.75	23.25	23.25	23.00	22.85	.....	22.50	22.00	22.00	22.00	22.00	22.00	22.00	21.50	19.50	.....
Low phos bar crops and smaller	21.25	21.25	20.75	20.75	20.50	20.35	.....	20.00	19.50	19.50	19.50	19.50	19.50	19.50	19.00	17.00	15.50
Low phos punchings and plate scrap	21.25	21.25	20.75	20.75	20.50	20.35	.....	20.00	19.50	19.50	19.50	19.50	19.50	19.50	19.00	17.00	15.50
Heavy cut structural, plate, 3 feet, under	19.75	19.75	19.25	19.25	19.00	18.85	.....	18.50	18.00	18.00	18.00	18.00	18.00	18.00	17.50	15.50	14.00
Heavy cut structural, plate, 2 feet, under	20.25	20.25	19.75	19.75	19.50	19.35	.....	19.00	18.50	18.50	18.50	18.50	18.50	18.50	18.00	16.00	14.50
Heavy cut structural, plate, 1 foot, under	20.75	20.75	20.25	20.25	20.00	19.85	.....	19.50	19.00	19.00	19.00	19.00	19.00	19.00	18.50	16.50	15.00
Cut automotive steel scrap, 3 feet, under	18.75	18.75	18.25	18.25	18.00	17.85	.....	17.50	17.00	17.00	17.00	17.00	17.00	17.00	16.50	14.50	13.00
Cut automotive steel scrap, 2 feet, under	19.25	19.25	18.75	18.75	18.50	18.35	.....	18.00	17.50	17.50	17.50	17.50	17.50	17.50	17.00	15.00	13.50
Cut automotive steel scrap, 1 foot, under	19.75	19.75	19.25	19.25	19.00	18.85	.....	18.50	18.00	18.00	18.00	18.00	18.00	18.00	17.50	15.50	14.00
Alloy free low phos, sulphur turnings	16.75	16.75	16.25	16.25	16.00	15.85	.....	15.50	15.00	15.00	15.00	15.00	15.00	15.00	14.50	12.50	11.00
First cut heavy axle and forge turnings	18.25	18.25	17.75	17.75	17.50	17.35	.....	17.00	16.50	16.50	16.50	16.50	16.50	16.50	16.00	14.00	12.50
Electric furnace bundles	19.75	19.75	19.25	19.25	19.00	18.85	.....	18.50	18.00	18.00	18.00	18.00	18.00	18.00	17.50	15.50	14.00

*Includes Brackenridge, Butler, Monessen, Midland, Pa.

GRADES ORIGINATING FROM RAILROADS	*Pittsburgh	Youngstown	Cincinnati, Cleveland, Middletown, O. Ashland, Ky.	Los Angeles, San Francisco	Birmingham	Buffalo	Chicago	Detroit	Duluth	Kansas City, Mo.	Kokomo, Ind.	Philadelphia	Portsmouth, O.	Seattle, Wash.	Sparrows Pt., Md.	St. Louis	Wilmington, Del.
No. 1 Railroad Heavy Melting	21.00	21.00	20.50	18.00	18.00	20.25	19.75	18.85	19.00	17.00	19.25	19.75	20.50	15.50	19.75	18.50	19.75
Scrap Rails	22.00	22.00	21.50	19.00	19.00	21.25	20.75	19.85	20.00	18.00	20.25	20.75	21.50	16.50	20.75	19.50	20.75
Rails for Rerolling	23.50	23.50	23.00	20.50	20.50	22.75	22.25	21.35	21.50	19.50	21.75	22.25	23.00	18.00	22.25	21.00	22.25
Scrap Rails, 3 ft., under	24.00	24.00	23.50	21.00	21.00	23.25	22.75	21.85	22.00	20.00	22.25	22.75	23.50	18.50	22.75	21.50	22.75
Scrap Rails, 2 ft., under	24.25	24.25	23.75	21.25	21.25	23.50	23.00	22.10	22.25	20.25	22.50	23.00	23.75	18.75	23.00	21.75	23.00
Scrap Rails, 18-in., under	24.50	24.50	24.00	21.50	21.50	23.75	23.25	22.35	22.50	20.50	22.75	23.25	24.00	19.00	23.25	22.00	23.25

*Includes Wheeling, Steubenville, Sharon, Canton.

Maximum Price at Shipping Point. Where the shipment of the scrap to the consumer is wholly or partially by rail, or vessel, or combination of rail and vessel, the scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel for shipment to the consumer.

Where shipment of the scrap to the consumer is solely by motor vehicle, the scrap is at its shipping point when it has been loaded on such vehicle.

The shipping point price for grades 1 of cast iron scrap at the following shipping points in the United States shall be:

	Group A	Group B	Group C
No. 1 Cupola Cast	$18.00	$19.00	$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	14.00	15.00	16.00
Heavy Breakable Cast	16.50	17.50	18.50
Charging Box Size Cast	17.25	18.25	19.25

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C includes all states not named in groups A and B.

Maximum Price Delivered to a Consumer. Scrap is at its point of delivery to a consumer when it has arrived for unloading at the plant of the consumer.

Open Hearth grades refer to No. 1 Heavy Melting steel, No. 1 hydraulic compressed black sheet scrap, No. 2 heavy melting steel, dealers' No. 1 bundles, dealers No. 2 bundles and No. 1 busheling.

Blast Furnace grades refer to mixed borings and turnings, shoveling turnings, No. 2 busheling and cast iron borings.

On open hearth grades, blast furnace grades, electric furnace and foundry grades the maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. In no case is any grade deemed by buyer or seller or both to be superior to any grade listed above but sold at a premium above the corresponding listed grade except upon approval by the OPA. No special preparation charges may in any case be added to the prices listed above.

On electric furnace and foundry grades whenever any of these grades is purchased for open hearth or blast furnace consumption the price paid, therefore, may not exceed the price listed herein for the corresponding open hearth grade.

No commission is payable except by a consumer to a broker for services rendered, the commission not to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage; the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; the broker does not split the commission with the seller of the scrap, with another broker or subbroker, or with the consumer. No commission is payable to a person for scrap which he prepares. No person who has not acted as a broker prior to April 3, 1941 is allowed a brokerage commission.

Sheets, Strip

Sheet & Strip Prices, Page 108

Sheet demand shows little sign of slackening and mills find little opportunity of shipping on orders with less than the highest priorities. Production has been reduced appreciably by conversion of continuous mills to plates and diversion of semifinished steel to other uses, some sheet mills being unable to operate full.

Orders are being distributed for about 190,000 tons of sheets and bars (principally the former), for 340,000 cargo truck bodies to be built by Edward G. Budd Mfg. Co, at its plants at Philadelphia and Detroit for the United States Army. Shipments are to begin within a few weeks, with No. 10 gage sheets the chief item. In view of the special type of body specified it is assumed a corresponding number of motors and frames will be required.

Narrow cold strip orders are about equal to shipments, bookings having increased somewhat recently, mainly for rated tonnage. Household appliance fabricators have almost stopped buying. Hot strip shipments are geared close to war requirements and for the most part are against rated tonnage.

Plates

Plate Prices, Page 108

Hardest pressed of steelmakers, plate mills find difficulty in making deliveries below A-1 ratings. In spite of the fact that production is being increased as continuous sheet and strip mills are converted to plate production standard plate mills continue to be heavily booked with orders for wide plates for the Maritime Commission and the Navy, with new allocations being received constantly.

Many consumers, including freight car builders, have little chance of obtaining their requirements except from the converted strip mills. It has been proposed that shipyards also take plates from continuous mills and perform their own finishing operations, such as shearing and beveling. However, few shipyards have equipment for these purposes.

The few small lots available through distributors are being absorbed for fill-in requirements under high ratings, especially in sheared plates. More small orders are being placed by district procurement officers connected with navy yards and government shops since they have been given greater latitude in placing orders. Tank inquiry, except for defense, has practically halted. A leading tank fabricator has closed its district sales office in the East while present conditions continue.

Plate mills in the South are loaded with requirements for shipyards and freight car building shops have practically nothing for civilian delivery.

PLATE CONTRACTS PENDING

510 tons, for delivery f.o.b. Gasconade, Mo.; bids under Inv. 199 to United States engineer office, Kansas City, rejected.

375 tons, three elevated tanks, Defense Public Works, Vallejo, Calif.; bids Jan. 30.

103 tons, marine boiler plate, Navy Purchasing office, New York, sch. 4918; bids Jan. 27.

Bars

Bar Prices, Page 109

Pressure for steel bar delivery is increasing and is probably second only to plates, including hot-rolled, cold-drawn and alloy. In some industries consumption is many times as heavy as normal. Demand is coming from a wider field as war production is spread over plants formerly not utilizing bars in their output.

This is especially notable in sections where shipbuilding is an important industry and also in New England where small arms, projectile and marine hardware manufacture are concentrated. Practically all orders for these purposes have top priorities. Boston navy yard has placed 750 tons of nickel alloy bars and 437 tons of hot-rolled rounds. The Navy has placed new chain contracts, aggregating several thousand tons, much to be forged. A forging shop at Chester, Pa., took a large part of this business.

Airplane engine builders and

shops producing shells account for a heavy tonnage of alloy steel bars.

Pipe

Pipe Prices, Page 109

Merchant steel pipe quotas to distributors for first quarter are sufficient to meet spotty demand and some additional tonnage is available for higher priorities. Reduced private construction has slackened buying by the plumbing supply trade but industrial and war requirements are substantial. Tubing demand is active, notably for alloy tubing for aircraft. The furniture industry is taking its full quota against curtailed allocations.

Indian Motorcycle Co., Springfield, Mass., has taken an order for 13,105 special light army motorcycles in addition to 5500 now under construction. The contract approximates $6,295,000. Wolverine Tube Co., Detroit, is low on 700,000 pounds of copper-nickel condenser tubes for the Boston navy yard, at $335,090.

Cast pipe producers are operating to the extent that pig iron is available. Most of their product goes to government projects. Municipal buying is at a minimum.

Award of approximately 13,000 tons of cement-lined pipe and fittings for New York city are expected shortly, four foundries bidding on the inquiry, the largest appearing in the east in more than a year. Except for this lot municipal demand is light, but buying for water line extension in connection with defense is holding well with export inquiry heavy, but part of the latter being met.

CAST PIPE PLACED

2400 tons, various sizes, Camp Livingston, La., to American Cast Iron Pipe Co., Birmingham; Dellone Construction Co., Dallas, Tex., contractor.

290 tons, 6-inch, water line, Fort Leonard Wood, Mo., to National Cast Iron Pipe Co., Kansas City, Mo.; Dan Christensen Construction Co., Cedar Rapids, Iowa, contractor.

CAST PIPE PENDING

425 tons, Panama, sch. 5853, cement-lined, United States Pipe & Foundry Co., Burlington, N. J., low.

200 tons, 20-inch, cement-lined, Panama, sch. 5862, American Cast Iron Pipe Co., Birmingham, Ala., low.

Unstated, several housing projects in Seattle; bids in to Seattle Housing Authority.

Unstated tonnage, 18, 14, 12, 8 and 6-inch diameters, sewer system, North and South Dearborn street, Chicago, for department of public works; bids Feb. 2.

Wire

Wire Prices, Page 109

Wire demand continues strong and bookings equal or exceed shipments. Due to limitations of wire rod supply some mills will produce less finished wire this month than last. Wiremaking equipment is fully engaged to the extent of semifinished available.

Much experimentation is under way, seeking substitutes for numerous alloy specialties, in view of reduced supplies of tin, chromium and similar alloying elements. As a tinned wire substitute some consumers will try bright steel wire. New coatings are being given consideration for fabrication into various products. Paper clips, thousands of boxes required by the government, are normally of tinned wire. Attempts to use oxidized wire has resulted in brittleness. Specifications must be changed in razor blade steel, due to lack of chromium, and heating wires of nickel-chromium are affected by lack of these metals.

Definite shortage of nails and fencing is felt, especially in rural regions.

Some indication of the demand for small steel wire products for the navy alone is covered by one inquiry for delivery at Sewalls Point, Va., closing Jan. 30, including: 202,000 steel wire desk baskets, 535,000 bull dog paper clips, 3,285,000 boxes wire paper clips, 168,000 boxes brass paper fasteners, 405,000 boxes flexible paper fasteners, 19,000 boxes pinch type paper fasteners, 12,000 cards lettering pens, 12,000 cards steel mapping pens, 2000 cards ruling pens, 725 cards lettering pens, 43,000 gross steel writing pens, 70,000 paper perforators, 122,000 pyramids brass pins, 65,000 corrosion resisting steel erasing shields, and 752,000 dozen steel thumb tacks.

Rails, Cars

Track Material Prices, Page 109

Promise of completion of 36,000 freight cars over the next three months means increased activity by builders and heavy demand for steel to go into their construction. Better allocation of material will be provided as the additional cars are considered essential to move traffic generated by war activities. Conversion of sleepers and parlor cars is being undertaken to add to passenger capacity in view of heavy troop movements.

LOCOMOTIVES PLACED

National Steel Co. of Brazil, nine steam locomotives to H. K. Porter Co., Pittsburgh.

War Department, 50 steam switchers for Near East, 20 to Vulcan Iron Works, 15 to Davenport-Besler Corp. and 15 to H. K. Porter Co., Pittsburgh.

LOCOMOTIVES PENDING

Alaskan railroad, purchasing agent, two storage battery type mine locomotives; bids Feb. 6, inv. 09586, Seattle.

Argentine State Railways, 10 to 15 steam locomotives; bids asked.

New York Central, unspecified number oil-electric, bids Feb. 5.

Petroleos Mexicanos, two steam locomotives; bids asked.

CAR ORDERS PLACED

Navy, 12 fifty-ton steel flats for Charleston, S. C., yard, to American Car & Foundry Co., New York.

New York Central, 125-ton transformer cars to Despatch Shops Inc., Rochester, N. Y.

Pittsburgh & West Virginia, 100 fifty-ton steel box cars to own shops.

CAR ORDERS PENDING

Argentine State Railways, 400 forty-ton flat cars; bids asked.

War Department, 350 fifty-ton flat cars; bids asked.

RAIL CONTRACTS PENDING

510 tons, Panama, sch. 5851, United States Steel Export Co., Washington, only bidder.

BUSES BOOKED

Twin Coach Co., Kent, O.: Forty 40-passenger for New York Transit Co., Brooklyn, N. Y.; fifteen 31-passenger for Triple Cities Traction Co., Binghamton, N. Y.; ten 41-passenger and ten 35-passenger for Railway Equipment & Realty Co., Oakland, Calif.; ten 31-passenger for Winnipeg Electric Co., Winnipeg, Man.; eight 35-passenger for Schenectady Railway Co., Schenectady, N. Y.; eight 27-passenger for Springfield Transportation Co., Springfield, Ill.; five 41-passenger for United Electric Railway, Providence, R. I.; five 27-passenger for Southern Indiana Gas & Electric Co., Evansville, Ind.; four 27-passenger for Carolina Power & Light Co., Raleigh, N. C.; three 27-passenger for Georgia Power Co., Atlanta, Ga.; three 27-passenger for Bremerton-Charleston Transportation Co., Bremerton, Wash.

Stainless Prices Held

Carnegie-Illinois Steel Corp. has issued a new price list, No. 14, covering stainless steels. Quotations are unchanged from those published in list No. 13, although numerous grades have been eliminated from the schedule, including standard types No. 312, 315, 327, 418, 438 and 439. In addition, the list carries no effective date, but

instead indicates the date of issue as Jan. 1, 1942. In the past it has been the practice of this company to issue a list showing the effective period covered by the list.

Structural Shapes

Structural Shape Prices, Page 109

Structural demand is mainly for war purposes, highways and bridges being sharply curtailed, with secondary projects and county roads deferred. Bridges allowed to be placed will carry the same ratings as the plants, camps, bases and airfields they serve. This policy is increasingly noted in the type of structural inquiry appearing for estimates. Orders for steel piling are in smaller volume but mills are heavily booked with orders placed recently. A large tonnage of miscellaneous shapes is being taken for shipbuilding.

New construction for 1942 is estimated as likely to approximate ten and one-half billion dollars, private building being substantially reduced with industrial plant and military and navy projects much heavier, the latter being doubled over last year. On this basis structural mills expect to produce more plain material than in 1941.

SHAPE CONTRACTS PLACED

9000 tons, 34 hangars for United States Army engineers, to Wisconsin Bridge & Iron Co., Milwaukee.

2500 tons, transmission towers, Grand Coulee dam, Wash., between Chehalis and Covington, Wash., line No. 2 and Covington to Coulee line No. 2, Wash., to American Bridge Co., Pittsburgh.

1590 tons, penstock coaster gates for Grand Coulee dam, to American Bridge Co. by Reclamation Bureau.

1200 tons, factory addition, Miehle Printing Press & Mfg. Co., Chicago, to New City Iron Works, Chicago; Niestadt & Love, Chicago, engineers.

1050 tons, two buildings for naval supply depot, Oakland, Calif., to Judson-Pacific Corp., San Francisco.

800 tons, prefabricated building, Richmond Shipbuilding Corp., Richmond, Calif., to Herrick Iron Works, Oakland, Calif.

725 tons, powerhouse, Virginia Electric & Power Co., Norfolk, Va., to Virginia Bridge Co., Roanoke, Va., previously reported as 600 tons; Stone & Webster Engineering Corp., Boston, contractor; reinforcing steel pending.

700 tons, addition, Adirondack Foundries & Steel Inc., Watervliet, N. Y., to Frank M. Weaver & Co. Inc., Lansdale, Pa.

562 tons, crane, American Steel Foundries, East Chicago, Ind., to Manning, Maxwell & Moore Inc., New York.

556 tons, power house, Fort Peck dam, Montana, to St. Joseph Structural Steel Co., St. Joseph, Mo.; Fegles Construction Co., Minneapolis, contractor; bids to United States Engineer, Kansas City, Mo., Dec. 12.

550 tons, bridge No. 4, War Department Building-road network, Washington to Bethlehem Steel Co., through Cayuga Construction Co., New York.

500 tons or more, steel towers, 99-mile Coulee-Midway power line, to American Bridge Co., low $391,947, by Bonneville Power Administration.

200 tons, hangar and boiler house, flying field, Columbus, Miss., to Bethlehem Steel Co., Bethlehem, Pa., bought direct; 35 tons, reinforcing bars, to Ceco Steel Products Corp., Birmingham; Algernon Blair, Montgomery, Ala., contractor.

140 tons, plant for Sharp & Dohme, Glen Olden, Pa., to Bethlehem Fabricators, Bethlehem, Pa.

135 tons, alterations, Crane Co., Chicago, to Mississippi Valley Structural Steel Co., Decatur, Ill.

100 tons, sheet piling, Peavy Falls dam, Sagola, Mich., to Bethlehem Steel Co., Bethlehem, Pa.; C. R. Meyer & Sons, Oshkosh, Wis., contractor; bids Dec. 8.

100 tons, addition, American Transformer Co., Newark, N. J., to Hudson Structural Iron Works, Jersey City; Fred J. Brotherton, Inc., Hackensack, N. J., contractor.

Unstated tonnage, powder plant, Hercules Powder Co., Merrimac, Wis., to Clinton Bridge Works, Clinton, Iowa, Mason & Hanger Co., New York, engineers.

Unstated tonnage, powerhouse, Acme Wire Co., Hamden, Conn., shapes to Connecticut Structural Co., New Haven; bars, Truscon Steel Co., Youngstown,

SHAPE AWARDS COMPARED

	Tons
Week ended Jan. 24	19,808
Week ended Jan. 17	17,718
Week ended Jan. 10	36,562
This week, 1941	98,582
Weekly average, 1942	24,696
Weekly average, 1941	27,373
Weekly average, Dec. 1941	17,619
Total, 1941	176,610
Total, 1942	74,088

Includes awards of 100 tons or more.

O.; Mott-Mohr Construction Co., New Haven, contractor.

SHAPE CONTRACTS PENDING

27,826 tons, gates, valves and bulkheads, third locks project, Panama; also 4095 tons, steel castings; 1334 tons, steel forgings; 243 tons, steel pipe, and 196 tons, copper, nickel and brass products; bids March 3, sch. 5850, Washington.

2000 tons, building, Vickers Co., Detroit; Turner Construction Co., New York, contractor, has bids.

2000 tons, 188 warehouses, 30 x 100 feet, for United States Army engineers, Washington; also probably 600 tons corrugated sheets.

1800 tons, Navy warehouses, Mechanicsburg, Pa.

1200 tons, plant additions, Scullin Steel Co., St. Louis; Westlake Construction Co., St. Louis, general contractor.

910 tons, Continental Roll & Steel Foundry Co., Coraopolis, Pa., Fort Pitt Bridge Works, Pittsburgh, low.

900 tons, turbine testing laboratory, Philadelphia navy yard; Ralph Herzog low on general contract.

831 tons, subway improvement, East Eighty-Third street, Chicago, for city, Duffin Iron Co., Chicago, low; bids Jan. 16.

500 tons, turbine testing laboratory, navy yard, Philadelphia; bids Jan. 22.

500 tons, factory for Hygrade Sylvania Co. in eastern Pennsylvania; bids Jan. 19.

450 tons, switch structures, Bonneville power house; bids in to U. S. Engineer, Portland, Oreg.

400 tons, addition for American Brake Shoe & Foundry Co., Baltimore; bids Jan. 23.

250 tons, hangar, Republic Aviation Corp., Farmingdale, N. Y.

100 tons, runways, four 50-ton overhead cranes, Watertown, Mass., arsenal, Shaw-Box Crane & Hoist division Manning, Maxwell & Moore, Muskegon, Mich., low at $163,577; bids Jan. 15, Boston.

100 tons or more, caisson gate of welded structural steel, dry dock No. 4, South Boston, Mass., to Eureka Shipbuilding Corp., New York, $170,000 awarded Jan. 20, Bureau of Yards & Docks, Navy Dept., Washington, spec. 10767, bids Jan. 14, completion, 270 days.

Unstated, Bonneville-Midway power line, bids to Bonneville Power Administration Jan. 26, No. 2524.

Unstated, Bradford Island crossing No. 4; bids to Bonneville Power Administration, Jan. 26, No. 2525.

Reinforcing Bars

Reinforcing Bar Prices, Page 109

Demand for reinforcing material is increasing seasonally, mainly for bridge and highway work. Considerable of this is for approaches to munitions plants and carries the same priority as the plants. Small lot orders from warehouses are filled with difficulty as assortments

CONCRETE BARS COMPARED

	Tons
Week ended Jan. 24	9,727
Week ended Jan. 17	12,259
Week ended Jan. 10	9,698
This week, 1941	12,523
Weekly average, 1942	10,561
Weekly average, 1941	13,609
Weekly average, Dec., 1941	7,362
Total, 1941	38,977
Total, 1942	31,684

Includes awards of 100 tons or more.

are badly depleted and replacement shipments lag.

Supplemental contracts for Atlantic coast bases call for prompt delivery tonnages. New Jersey road projects considered of high defense importance will require about 1000 tons. Pending volume is less and requests for estimates are dwindling.

REINFORCING STEEL AWARDS

3000 tons, for Honolulu Iron Works, Honolulu, to Great Lakes Steel Corp., Detroit.

1500 tons, Navy storehouses, Mechanicsburg, Pa., to Taylor-Davis Inc., Philadelphia, through Brann & Stewart, Philadelphia; also 420 tons of mesh to American Steel & Wire Co. and Truscon Steel Co.

1000 tons, estimated, pier buildings and facilities, naval training station, Newport, R. I., to Jones & Laughlin Steel Corp., Pittsburgh, through P. T. Cox Contracting Co. and Spearin, Preston & Burrows, New York, joint contractors.

1000 tons, estimated, including 130,000 squares non-corrosive reinforcing fabric, flood control, U. S. Engineer, Memphis, Tenn., to Copperweld Steel Co., Glassport, Pa., $3.125 per square, f.o.b. barges or dock, contractors' plant, inv. 91F; also 7,325,000 non-corrosive twist wires at 1.945c and 1.615c each; 660,000 linear feet non-corrosive anchor wire, 1.598c per foot, f.o.b. cars, contractors' plant, inv. 92F and 93F respectively; bids Dec. 29.

570 tons, pump house, Susquehanna Flood Control Commission, near Wilkes-Barre, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, Panama, sch. 5818, to Bethlehem Steel Export Co., New York, $30,500; bids Dec. 23, Washington.

500 tons, armor plate plant, General Steel Castings Corp., Granite City, Ill., to Laclede Steel Co., St. Louis; Frazier-Davis Construction Co., contractor.

385 tons, additional facilities, navy yard, Portsmouth, N. H., to Bancroft & Martin Rolling Mills Co., Portland, Me., through Aberthaw Co., Boston.

300 tons, Bureau of Reclamation, Inv. D-38,212-A-7, Odair, Wash., to Youngstown Sheet & Tube Co., Youngstown, O.; bids to Denver, Dec. 23. An additional 2550 tons awarded as reported in STEEL, Jan. 12.

250 tons, addition to Post-Dispatch building, St. Louis, to Laclede Steel Co., St. Louis, through Westlake Construction Co., St. Louis, general contractor.

212 tons, Hines Veterans Memorial hospital, Hines, Ill., to Inland Steel Co., Chicago, through Federal-American Cement Tile Co., Chicago.

150 tons, state highway project 25, Dayton, O., to Republic Steel Corp., Cleveland, through Truscon Steel Co., Youngstown, O.; Carl Meyer & Pierce Construction Co., contractors.

138 tons, flood wall project, United States Engineer, Mound City, Ill., to Laclede Steel Co., St. Louis, Stiers Bros., St. Louis, contractor.

122 tons, laboratory building, Watertown, Mass., arsenal, to Concrete Steel Co., Boston; J. J. Powers Co., Cambridge, Mass., contractor; A. O. Wilson Structural Co., Cambridge, awarded 42 tons, fabricated structural steel.

100 tons, building, Lycoming Motors division Aviation Mfg. Corp., Williamsport, Pa., to Sweets Steel Co., Williamsport, through Sordoni Construction Co., Forty Fort, Pa.

REINFORCING STEEL PENDING

3850 tons, for Grand Coulee project, bids to Denver; low, Sch. No. 1, Carnegie-Illinois Steel Co., $32,500; No. 2, Inland Steel Co., Chicago, $32,500; No. 3, Republic Steel Corp., Cleveland, $33,400; No. 4, Carnegie-Illinois, $32,500; No. 5, Republic, delivered, $43,420; Great Lakes Steel Corp., Detroit, plant, $27,950; No. 6, Bethlehem Steel Co., $44,460; No. 8, Colorado Fuel & Iron Corp., Denver, $15,850.

1036 tons, U. S. Engineer, Norfolk, Va.; inv. 235, bids Feb. 3, all but 39 tons are one-half inch square; remainder one-inch rounds.

625 tons, State street subway, contract S-8B, Chicago, for city; bids Jan 29.

500 tons, estimated, James Creek housing project, Washington; C. B. Ross, Inc., New York, low, $1,137,000; bids Jan. 16 to Alley Dwelling Authority, Washington.

150 tons, factory, Keokuk Electro-Metals Co., Keokuk, Iowa, general contract to Cameron & Joyce Co., Keokuk, Iowa; bids Jan. 9.

100 tons, state highway projects, Connecticut; bids Jan. 26, Hartford, Conn.

Unstated, shops, warehouse, heating plant, assembly, magazines, igloos, etc., McChord Field, Washington state; C. F. Davidson, Tacoma, low, $334,056.

Unstated, undercrossing, Hermiston, Ore., ordnance depot; funds appropriated by Bureau of Roads; bids soon to state highway department.

Pig Iron

Pig Iron Prices, Page 110

Pig iron supply under the allocation plan is providing sufficient material for foundries on war work with some tonnage for civilian production. Some consumers delaying filing of requisitions in the cur-

rent allotment will be passed over and receive no iron.

Dislocated pig iron tonnages are being gradually eliminated and a larger proportion is being sold on the home base price. This eliminates considerable cross hauling. Reassignments have been made of tonnages allocated to stacks later forced down for relining. Some of this has been assigned to stacks outside the natural area for these suppliers.

In some cases larger pig iron consumers taking on defense contracts involving finished steel fabrication will require less iron than usual, machining and assembly departments being relatively busier than foundry departments. Many of these consumers have been operating from pig iron inventory, not requiring monthly shipments and as a result the change will not affect iron distribution.

New England consumers are cooperating with the local blast furnace in building some reserve in anticipation of relining. Some difficulty has been experienced in obtaining silvery iron but no actual distress has resulted. Furnaces down for relining are being repaired as promptly as possible and indications are several will be relighted in a short time, adding to total production.

Bids close Feb. 5 on 2409 tons, foundry pig iron for the navy delivery various yards; 335 tons, Philadelphia, with the larger individual deliveries for the Pacific Coast, schedule 172.

Only one furnace quoted on the full inquiry for 1340 tons, foundry pig iron, delivery, Norfolk, Va., at the recent navy opening for 1513 tons, various yards. This was the Alan Wood Steel Co., Conshohocken, Pa., $31.71, delivered; Hanna Furnace Corp., Detroit, quoted $30.29 on part of the inquiry. No bids were received for iron for delivery to other points; schedule 9715.

Scrap

Scrap Prices, Page 112

Scrap supply is spotty but not materially improved for the industry as a whole. Collections held back by zero weather have been resumed and the supply in northern districts has improved to some extent. However, consumers are unable to accumulate reserves for more than a few days and continue to operate on a narrow margin, often from day to day. Open hearths idle for lack of sufficient raw material have not been returned to production and steel output is severely reduced in some districts.

Various methods are being considered for gathering scrap known to be available if means for collection is provided. Cities are organizing scrap campaigns, house-to-house, and by search for obsolescent material in industrial establishments. A St. Louis grocery firm which paid for scrap in groceries collected 20 tons, which was sold to dealers. Seattle and Portland have offered OPM 19,700 tons of street car rails if the latter will remove them and resurface the streets. A Detroit scrap dealer is using radio announcements offering the public 60 cents per 100 pounds for scrap taken to its yards.

A source of large tonnage is automobile wreckers' stocks and means are being considered to make this available. This material is not under the scrap industry and wreckers are slow to dismantle the cars and sell the scrap, preferring to use their stock as a source of replacement parts. Scrap on farms is believed to aggregate a large tonnage but its collection is difficult

Tool Steel Scrap

Cents per pound, to consumers f.o.b. shipping point

Tungsten Types

For each 1% tungsten contained

Solid scrap containing over 12%	1.80c
Solid scrap containing 5 to 12%	1.60
Turnings, millings containing over 12%	1.40
Turnings, millings, solids under 5%	1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 0.50 vanadium	13.50
Turnings, millings, same basis	11.50

and offers little profit to those who would gather it.

Warehouse

Warehouse Prices, Page 111

Much dissatisfaction exists as a result of working of the schedule announced some weeks ago by OPA fixing prices at the level prevailing April 16, 1941. In many cases prices in effect late last year were considerably higher than at that date. Regulations accompanying the price order are also under fire and the industry has asked Administrator Henderson for opportunity to present its case and explain the troubles now current.

One difficulty is found in the matter of "dislocated" tonnage. Lack of full stocks prevents many warehouses from supplying items a buyer needs and the regulations prevent obtaining the material from other areas.

In general, shipments from mills to warehouses are much below requirements, particularly in plates, sheets, strip and some descriptions of tubular goods. As a result even orders with high priority often can not be filled. In some cases jobbers have been able to obtain material which does not pass specifications for defense work but which can be used for other purposes. However, these tonnages are not sufficiently large to relieve the situation materially.

Deliveries of stainless steel are sharply restricted as producers are unable for most part to ship against orders below A-1-j.

Pacific Coast

San Francisco—Of primary importance was the award by the Maritime Commission of 387 EC-2 type and 15 C-4 type cargo vessels to Pacific Coast shipyards. The tonnage of plates involved, to be allocated to various mills, exceeds the former high yearly total by over 235,000 tons. Todd-California Shipbuilding Corp., Richmond, Calif., will build 125 of the EC-2 type vessels, California Shipbuilding Corp., Wilmington, Calif., 109 ships, Oregon Shipbuilding Corp., Portland, Oreg., 88 EC-2 type freighters and Kaiser Shipbuilding Corp., Vancouver, Wash., 61 EC-2 type boats. A new company, Kaiser Co., Richmond, Calif.. will build 15 C-4 cargo vessels. The plate tonnage involved in the EC-2 type boats aggregates 772,576 tons in addition to 212,302 tons of structurals. The C-4 type boats require 41,400 tons of plates and 27,600 tons of shapes. Plate awards aggregated 819,256 tons and brought the total to date to 821,781 tons as compared with only 100,795 tons for the corresponding period in 1941 and the former high yearly total in 1941 of 581,607 tons. Bids opened on 600 tons for navy lighters on the Pacific Coast and bids open on Jan. 30 for 375 tons for three elevated tanks at Vallejo, Calif., for Defense Public Works.

Little private structural work is coming out for figures and over 90 per cent of the output of Pacific Coast fabricating plants is to go into National Defense projects.

The largest reinforcing bar award involved 3000 tons for the Honolulu Iron Works, Honolulu, placed with Great Lakes Steel Corp., Detroit. No other awards of size were reported. Awards aggregated 3079 tons and brought the total for the year to 6125 tons as compared with 6181 tons for the corresponding period in 1941.

The only cast iron pipe letting of size involved 100 tons for a sewer system at Bakersfield, Calif. So far this year 233 tons have been placed, compared with 4063 tons for the same period last year.

Seattle—Industrial expansion in the Pacific Northwest is keeping step with the accelerated national defense activity, several important developments having matured in the past week. Pacific Car Foundry Co., Seattle, has taken a defense contract which will require about 3500 additional men at the Renton plant, according to President Paul Pigott. Additions to the present plant, occupying 43 acres, will be necessary.

Authentic reports indicate that the Oregon Shipbuilding Corp., Portland, will be awarded 90 more 10,500-ton steel freighters, totaling $150,000,000 in which event the Portland yard's capacity will be

trebled, now having 11 ways. Sites are under consideration at Vancouver, Wash., for an auxiliary yard planned for eight or ten ways.

Bonneville Power Administration has authorized construction of the 185-mile, 230,000-volt, double circuit, steel tower transmission line Coulee to Covington, total cost $9,000,000, with $3,502,030 immediately available. This is the fourth circuit over the same route, the first now under construction and $2,319,400 allocated for the $4,500,000 second line. Construction on the second and third will begin as soon as steel can be obtained.

Webster-Brinkley Co., Seattle, executing a Maritime Commission contract for 252 steam steering engines for 10,000-ton freighters, has an additional order for like equipment, approximating $1,500,000.

Bonneville Power Administration has authorized construction of a $130,000 addition to the Walla Walla substation with $118,200 immediately available.

Seattle has offered OPM 16,000 tons of steel rails of the old street car system, providing the government picks them up and reconditions the streets. At Portland the city has 500 tons and the Port land Traction Co. 3200 tons which also have been offered. Scarcity of scrap is becoming more acute although rolling mills state they have sufficient supplies for immediate needs. Cast iron scrap is hard to obtain and foundries are seeking additional stocks.

Canada

Toronto, Ont.—Demand on the steel industry is growing and this country will have to import from the United States 1,750,000 tons of steel this year, while proposed additional war commitments are expected to bring the total to two or two and a quarter million tons. To bring about a closer equalization of supply and demand C. D. Howe, minister of munitions, announced that additions to two Canadian steel mills will represent expenditure of upwards of $20,000,000, and will result in increased output of steel by more than 500,000 tons and in pig iron over 700,000 tons annually. While some of these extensions will be ready this year, full program will not be completed until the early part of 1943. The increase in pig iron production is planned to replace scrap materials, which show indications of much greater shortage within the next few months.

Merchant bar orders are in large lots on war account but have dropped in number recently and practically all heavy lines are under direct government supervision. Tool builders have been taking large suplies recently.

Structural steel lettings continue to decline, 2000 tons for the week. About 10,000 tons are pending, however, in connection with war plant extensions.

Merchant pig iron sales are about 6000 tons weekly, of which foundry iron takes some 2000 tons; malleable 3000 tons and basic 1000 tons. By permission of the steel controller, blast furnace operators are moving larger tonnages of pig iron to merchant melters than during the greater part of last year. Scarcity of cast scrap has reached the point where pig iron must be available or there will be sharp curtailment in foundry operations.

With most of the districts outside Toronto under two or three feet of snow, there was sharp decline in scrap deliveries and dealers had to depend exclusively on local sources. Dealers have little hope of maintaining even the present low flow of iron scrap to consumers for any long period.

Coke Oven By-Products

Coke By-Product Prices, Page 109

Toluol production is being distributed under allocation, the larger part going for defense as are other distillates. Freight up to two cents a gallon is allowed. Contracts are being made on xylol with current prices applying for first quarter, shipments beyond that period subject to readjustment at 15 days notice. Little xylol is available for spot demand. Phenol for plastics requirements is active.

Nonferrous Metal Prices

Jan.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-12	12.00	12.12½	11.75	52.00	52.00	5.85	5.70	8.25	15.00	14.00	35.00
13-23	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	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)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.10
Zinc, 100 lb. base	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices

No. 1 Composition Red Brass

New York	10.12½-10.25
Cleveland	10.25-10.50
Chicago	10.25-10.50
St. Louis	10.50

Heavy Copper and Wire

New York, No. 1	10.00
Cleveland, No. 1	10.00
Chicago, No. 1	10.00
St. Louis	10.00

Composition Brass Turnings

New York	9.37½-9.75

Light Copper

New York	8.00
Cleveland	8.00
Chicago	8.00
St. Louis	8.00

Light Brass

Cleveland	6.00
Chicago	6.00-6.25
St. Louis	6.25

Lead

New York	5.95
Cleveland	5.95
Chicago	5.85
St. Louis	5.80

Old Zinc

New York	5.00-5.25
Cleveland	4.00-4.12½
St. Louis	4.50-5.00

Aluminum

Mis., cast	11.00
Borings, No. 12	9.50
Other than No. 12	10.00
Clips, pure	13.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l. c. l.	13.25
Standard No. 12 aluminum	14.50

Nonferrous Metals

New York—Program under the War Production Board will bring increased production but a simultaneous cut in civilian use beyond any curtailment now in effect.

Copper—It probably will be after Feb. 1 when OPA sets up its base quotas for 1941. MRC will pay premium prices up to 17.00c for production in 1942 in excess of these quotas. WPB is making a survey of 90 primary fabricators of copper to determine if full compliance with orders is being made. MRC is paying 11.75c, c.i.f. United States ports for Chilean copper.

Lead—All military and essential civilian needs are being met fully, according to C. H. Crane, president of St. Joseph Lead Co. However, civilian uses of lead are being curtailed.

Zinc—Domestic output is now above 80,000 tons monthly and is steadily easing the supply situation.

Tin—Deliveries are being made at southern ports due to the submarine menace around New York and New Jersey coasts. Consumption is being restricted to conserve present supplies.

Iron Ore

Iron Ore Prices, Page 111

December consumption of Lake Superior iron ore totaled 7,061,981 gross tons, compared with 6,501,027 tons in November and 6,173,038 tons in December, 1940. Cumulative consumption for 1940 was 76,335,682 tons, compared with 62,426,314 tons in 1940.

Ore on hand at furnaces and Lake Erie docks Jan. 1 totaled 40,456,893 tons, compared with 45,534,633 tons Dec. 1 and 36,072,833 tons Jan. 1, 1941.

Furnaces in blast Jan. 1 numbered 176, of which 169 were in the United States and seven in Canada. Idle furnaces numbered 12 in the United States and one in Canada. Available stacks totaled 189, including the new furnace of Weirton Steel Co., Weirton, W. Va., 181 in the United States and eight in Canada. A year ago 160 were in blast and 22 idle in the United States, six in blast and one idle in Canada, a total of 189 available.

Refractories

Refractories Prices, Page 110

Office of Price Administration has announced maximum prices on basic refractory material, effec-

tive Jan. 28. The maximum is the price prevailing for the past three years. For carloads, maintenance grades domestic dead-burned magnesite in bulk, $22 per ton, f.o.b. Chewelah, Wash. A delivered price in excess of the maximum may be charged, consisting of the maximum, plus railroad freight from Chewelah to the delivery point designated by the purchaser. The maximum for carload quantities in bags or sacks is established at $4 per ton above the bulk price.

The schedule applies only to maintenance grades but OPA announced its intention later to schedule prices for other grades of the same product and for all grades of basic refractory brick, whether containing magnesium or any combination. Reason for fixing the ceiling is given as competing demands of steel companies, furnace brick manufacturers and other steel producers.

Tin Plate

Tin Plate Prices, Page 108

The canning industry will receive enough tin plate to pack all vegetables for which the Department of Agriculture has set production goals, War Production Board officials have informed the canning industry advisory committee.

Plate will be provided for other perishable fruits and vegetables on a restricted basis, the committee was told, and other commodities not classed as essential foods will not be permitted to be packed in tin cans.

The tin order applies to canmakers who are given the allocation to make cans for the specific purposes mentioned.

Now in process of allocation is a large additional tonnage for export under lend-lease. If the program is carried out as now planned it is expected to place thin-gage flat-rolled steel among the scarcest rolled steel products.

Steel in Europe

Foreign Steel Prices, Page 111

London—(*By Cable*)—Steel output in Great Britain continues strong, following occasional interruption over the New Year holidays in Scotland for repairs. Pig iron and semifinished steel reserves are satisfactory. Future resumption of imports of semifinished steel from the United States is reported under consideration. Tin plate makers have been given an increased steel quota. Mills are booked several months ahead. Galvanized and plain sheets are active, mainly on government contracts.

Equipment

Boston—Machine tool buying is heavy, including an order placed with New Britain-Gridley Machine division, New Britain Machine Co., for screw machines, $4,784,830. Large purchases are also being made against the pool program in

connection with increased bomber production, numerous New England shops sharing heavily in machines being placed through Wright Field, O. Another wave of buying by most producers of all types of bearings is also under way, centered largely on supplemental estimated aircraft requirements. Lists are practically double original estimates and some further expansion in bearing plant facilities is likely. While extensive tooling, involving new attachments and fixtures is looked for in connection with the conversion of the automobile industry for defense, purchases of complete new units will not be heavy.

Seattle—Electrical equipment and automotive units continue in strongest demand. Private buying is restricted and practically all turnover is for defense agencies. Westinghouse Electric & Mfg. Co. is low to Reclamation Bureau, Denver, at $2,792,330 for furnishing three 108,000-kw generators for the Grand Coulee powerhouse. The same office has received bids from various firms for pipe valves for Coulee, aggregating $11,000. Allis-Chalmers Mfg. Co. is low at $20,912 to Tacoma for furnishing four circuit breakers.

New York—Machine tool backlogs continue to mount under pressure of sustained heavy buying, although weekly shipments are at record peaks with new facilities getting into production at a higher rate. Deliveries on some tools are improving, but the aggregate volume of new business adds to unfilled orders. Currently, numerous dealers and builders are booking orders close to 50 per cent above shipments. Conversion of the automobile industry for all-out defense will not result in the heavy volume expected. Much of the demand has been anticipated and equipment bought or on order; part of the machines now in use will be utilized for defense work, and, while substantial new buying will be done, the total will not be as large as generally supposed.

Construction and Enterprise

Ohio

AKRON, O.—Firestone Tire & Rubber Co., 1278 South Main Street, John W. Thomas, chairman, is planning 100,000-square foot factory building for armament production, the fourth addition begun in the past year for production of war materials.

ALLIANCE, O.—Alliance Clay Products Co., South Mahoning avenue, J. Oatis Wilcox, president, has revamped its No. 1 plant, equipping it with new machinery, etc., to manufacture sleeves, stoppers, nozzles and runner tile for steel foundries. Ralph M. Schory, is manager of the new unit and in charge of production.

CANTON, O.—City, L. W. J. Cooper, service director, plans sewage disposal plant costing approximately $1,500,000.

CLEVELAND—National Acme Co., 170 East 131st street, Fred H. Chapin, manager, will soon start erection of 31,350-square foot extension to factory.

CLEVELAND—Clark Controller Co., Prentice C. Clark, president, is starting third expansion within a year. Machine shop of the electrical goods factory will be enlarged by 3760 square foot addition at 1146 East 152nd street.

CLEVELAND—Warner & Swasey Co., 5701 Carnegie avenue, is completing plans for an 81,530-square foot building on East Fifty-fifth street, to house additional production facilities.

CLEVELAND — Hydraulic Equipment Co. will add 5500 square feet to its factory at 1100 East 222nd street. Hall Kirkham is president.

GALLIPOLIS, O.—Buckeye Rural Electric Co-operative Inc., John R. Lusher, superintendent, plans power distribution

Additional Construction and Enterprise leads may be found in the list of Shapes Pending on Page 117 and Reinforcing Bars Pending on page 118 in this issue.

plant costing about $250,000. Putnam & Woolpert, 132 North Main street, Dayton, O., engineers.

MASSILLON, O.—Tyson Roller Bearing Corp., Oberlin road, Southwest, is starting $300,000 extension to plant, to be used for manufacture of large bearings for ordnance and airplane engine parts. About $200,000 will be spent for machine tools to equip the building.

RAVENNA, O.—City, Karl M. Dussoll, service director, will be ready for bids in February for sewage disposal system repairs and improvements, including tanks, motor equipment, piping, control house, etc. Estimated cost $290,000, for which PWA has granted $140,000.

Connecticut

BRIDGEPORT, CONN.—Globe Tapping Machine Co., 751 Central avenue, plans two-story 48 x 100-foot factory addition. P. P. Petrofsky, 955 Main street, engineer.

DANBURY, CONN. — Bard-Parker Co. has plans by E. B. Watson, West street, for plant addition, costing approximately $40,000.

STAMFORD, CONN.—Stamford Engineering Works, 1248 Canal street, will build steel factory at cost of about $40,000.

New York

BLASDELL, N. Y.—Exolon Co. Inc., Blasdell, will erect a $500,000 factory on a 35-acre tract in Tonawanda, N. Y., and will also spend approximately $125,000 for another building and additions and alterations at the Blasdell plant. William A. Harty is president.

LONG ISLAND CITY, N. Y.—Demco Inc., care of Bulova Watch Co., 630 Fifth avenue, New York, plans 42 x 144-foot and 133 x 164-foot factory buildings at 50-30 Fifty-fifth avenue, costing $125,000; 133 x 164-foot and 42 x 144-foot factory buildings at 49-17 Maspeth avenue, costing $125,000.

TONAWANDA, N. Y.—Buffalo Electro Chemical Co. Inc. will build plant addi-

tion, to cost about $60,000.

New Jersey

HILLSIDE, N. J.—Wilkinson-Gaddis & Co., 95 Parkhurst street, Newark, plans to erect factory. Cost over $40,000.

HARRISON, N. J.—McKiernan-Terry Corp., 313 Manor avenue, has asked bids for one-story 60 x 580-foot and 80 x 580-foot corrugated asbestos steel factory buildings. Estimated cost $40,000. J. DiStasio & Co., 136 Liberty street, New York, architect.

LINDEN, N. J.—Standard Oil Co. of New Jersey, 500 North Broad street, Elizabeth, N. J., has awarded contract for three-story 50 x 58-foot steel power house addition to Arthur G. McKee & Co., Cleveland. Cost over $40,000.

Pennsylvania

COATESVILLE, PA. — By-Products Steel Corp., Coatesville, subsidiary of Lukens Steel Co., has awarded contract to Turner Construction Co., Architects building, Philadelphia, for plant addition. Estimated cost $700,000.

PHILADELPHIA — SKF Industries, Front and Erie streets, will spend approximately $100,000 for 145 x 296-foot plant. Turner Construction Co., Architects building, Philadelphia, has general contract. I. S. Towsley, Otis building, engineer.

Michigan

ANN ARBOR, MICH.—Ayres, Lewis, Norris & May, engineers, Ann Arbor, are completing plans for construction of sewer lines and pump station in Centerline, Mich.

BATTLE CREEK, MICH.—H. P. Jones, Toledo, O., engineer, has completed plans for a $300,000 addition to municipal sewage disposal plant here.

CENTERLINE, MICH.—Chrysler Corp. has awarded general contract to O. W. Burke Co., 1010 Fisher building, Detroit, for addition to its tank arsenal near here.

DETROIT—Motor Products Corp., 11801 Mack avenue, has given general contract to Albert A. Albrecht Co., 1204 Penobscot building, for addition to its factory. Smith, Hinchman & Grylls Inc., 800 Marquette building, architect.

DETROIT — Reisdorf-Brewe Co., has general contract for alterations to factory of Gray Marine Motor Co., 6910 East Lafayette street. Smith, Hinchman & Grylls Inc., 800 Marquette building, architect.

DETROIT—Ex-Cell-O Corp., 1200 Oakman boulevard, has awarded general contract to Austin Co., Detroit, for factory building, estimated to cost $425,000.

DETROIT—Dongan Electric Mfg. Co., 2987 Franklin street, has been incorporated with $250,000 capital to manufacture mechanical instruments. Correspondent: Lyle J. Hicks, 1335 Kensington, Grosse Pointe, Mich.

GRAND BLANC, MICH.—Darin & Armstrong Inc., 2041 Fenkel, Detroit, has general contract for construction of tank plant to be erected near here for Fisher Body Division of General Motors Corp.

Illinois

AURORA, ILL.—Sargent & Lundy, engineers, 140 South Dearborn street, Chicago, have awarded contract for superstructure of power plant addition for Western United Gas & Electric Co., Aurora, to Charles E. Glertz & Son, 57 Douglas street, Elgin, Ill. Total cost $500,000.

BROADVIEW, ILL.—Hub Plating Co., 1233 Fifty-second street, Cicero, Ill., has awarded contract for one-story 90 x 240-foot factory to E. Buzovsky, 5314 West Twenty-fifth street. Cost estimated at $50,000. F. Waeglein, 5301 West Nelson street, Cicero, architect.

CHICAGO—Chicago Gear Mfg. Co., 2823 West Fulton street, has started a $25,000 building program to accommodate increasing armament orders. A one-story warehouse addition, 50 x 150-feet will be built, and cranes will be installed.

CHICAGO—Chicago & North Western railroad will build an addition to its Proviso engine house here and has awarded construction contract to T. S. Leake Construction Co., Chicago. Cost, including equipment, will be about $30,000.

CHICAGO—Chicago Lock Co., 2024 North Racine avenue, has let contract to B. J. Regnell, 1005 West Belmont avenue, for two-story plant addition, to cost about $50,000. N. Ronneberg, 5050 West Grand avenue, architect.

CHICAGO—Eugene Dietzgen Co., 2425 North Sheffield avenue, has awarded contract to Austin Co., 510 North Dearborn street, for three-story plant addition. L. Monberg, 232 East Erie street, architect.

CHICAGO—Stewart Die Casting Division, Stewart Warner Corp., 4535 West Fullerton avenue, has given general contract to Campbell-Lowrie-Lautermilch Corp., 400 West Madison street, for one-story plant addition, costing $50,000. Olsen & Urbain, 8 East Huron street, architects.

GRANITE CITY, ILL. — General Steel Castings Corp., Essington avenue, Philadelphia, plans erection of steel foundry here, for which it has awarded general contract to Frazier-Davis Construction Co., 1319 Macklind street, St. Louis. Estimated cost $150,000. Giffels & Vallet, 1000 Marquette building, Detroit, engineers.

Alabama

PHENIX CITY, ALA.—City plans improvements to waterworks costing approximately $150,000. J. W. Goodwin, Martin building, Birmingham, Ala., engineer.

TALLADEGA, ALA.—City plans construction of sewage treatment plant, to cost approximately $153,700. J. W. Goodwin, Martin building, Birmingham, engineer.

Maryland

BALTIMORE — American Hammered Piston Ring Division, Koppers Co., Bush and Hamburg streets, will soon let contract for one-story, 80 x 120-foot steel foundry, to cost about $40,000.

North Carolina

SOUTHPORT, N. C.—J. A. Loughlin, 2014 Pender avenue, Wilmington, N. C., is engineer for additions and extensions to municipal power plant. John D. Eriksen is mayor. Allotment of $91,142 has been received.

WILMINGTON, N. C.—W. C. Olsen, Raleigh, N. C., is consulting engineer for improvements to waterworks and sewers, for which $525,000 bonds are available.

West Virginia

CHARLESTON, W. VA.—Carbide & Carbon Chemicals Corp., 30 East Forty-second street, New York, will soon begin work on plant here for manufacture of butadiene, for which Defense Plant Corp. has allotted $3,500,000. Ford, Bacon & Davis, New York, will supervise construction.

FOLLANSBEE, W. VA.—Sheet Metal Specialty Co., subsidiary of Follansbee

Steel Corp., is adding over 16,000 square feet of space to its plant. The new building, with installation of tinning line and a 30 per cent increase in welding equipment, will enable the company to produce 15,000 milk cans monthly.

Arkansas

MOUNTAIN PINE, ARK.—Dierks Lumber & Coal Co., Jess Rutledge, manager, plans installation of power plant with turbine capable of producing 1500 kilowatts.

Oklahoma

LAWTON, OKLA.—City, Everett Glenn, mayor, has approved $300,000 bond issue for waterworks, sewer and fire department improvements. Federal grant of $276,900 will supplement bonds.

Wisconsin

MADISON, WIS.—Gisholt Machine Co. will construct one-story addition to its plant to provide 50,000 square feet of floor space.

Texas

BROWNWOOD, TEX.—City, Wendell Mayes, mayor, will receive bids Jan. 30 for 200,000-gallon steel elevated tank; 32,500 feet of 10-inch, 900 feet of 8-inch and 4200 feet of 6-inch cast iron pipe, costing approximately $286,000; and will receive bids about Feb. 20 for improvements to sewage disposal plant to cost about $135,000. Julian Montgomery, Littlefield building, Austin, Tex., engineer.

EL PASO, TEX.—Headman-Ferguson & Carollo, P.O. Box 375, are preparing plans for extension of sewage treatment plant, including pumping plant and enlargement of present disposal plant. Cost approximately $400,000.

HOUSTON, TEX.—Emsco Derrick & Equipment Co., C. L. Lamkin, plant manager, plans expansion program to increase production 100 per cent, including addition to galvanizing plant at cost of approximately $20,000 and purchase of $35,000 galvanizing equipment.

MINERAL WELLS, TEX.—City, John C. Miller, mayor, will take bids Feb. 4 for primary and final settling tanks, aero filter, digester, pump house, etc. Cost about $110,850. Julian Montgomery, Littlefield building, Austin, Tex., engineer.

ORANGE, TEX.—Consolidated Steel Corp. of Texas, Capt. Harry B. Hird, vice president and general manager, plans $5,000,000 expansion program.

PASADENA, TEX.—City voted $250,000 water and sewer bonds to supplement federal allocation of $332,700 for erection of waterworks, including elevated tank.

Nebraska

OMAHA, NEBR.—Union Pacific Railroad Co., 1416 Dodge street, B. H. Prater, chief engineer, plans shop addition at Thirteenth and Cass streets. Estimated cost $64,000.

California

LOS ANGELES—Atlas Tool & Die Corp. has been oranized with 1000 shares of no par value capital stock by Louis, L. R. and H. Gorelick, all of Los Angeles. Representative: Louis Gorelick, 810 South Spring street.

SOUTH GATE, CALIF.—American Concrete & Steel Pipe Co. is erecting an addition to its plant at 4635 Firestone boulevard, at cost of $25,000.

Washington

BELLINGHAM, WASH. — City water board has $4000 available for purchase of auxiliary pumps and other system equipment.

SEATTLE—S. E. Sagstad Boatbuilding Co., 5109 Shilshole avenue, plans erection of machine shop.

Canada

VANCOUVER, B. C.—Simplex Engine & Mfg. Co., 1963 West Georgia street, plans erection of machine shop to cost, with equipment, about $50,000.

VANCOUVER, B. C.—Reeves MacDonald Mines Ltd., 616 Stock Exchange building, has completed arrangements with United States' interests whereby capital will be provided for construction of plant for recovery of lead and zinc at its property in the West Kootenay district of British Columbia. Undertaking to cost about $1,000,000.

FORT ERIE, ONT.—Town council has had plans prepared by C. R. Hagey Engineering Co., 158 Goderich street, and plans to spend $161,500 on extensions to waterworks system to include new pumping plant, filtration plant and installation of mains.

GALT, ONT. — Shirley-Dietrich-Atkins Ltd., 19 Glebe street, maker of saws, machine knives, etc., has given general contract to George Thomas Sons Ltd., 45 Dickson street, for construction of plant addition to cost about $40,000.

LINDSAY, ONT.—Department of Munitions and Supply, Ottawa, plans to start work without delay on additions to Dominion Arsenal here to cost about $1,500,000. Proposed work will include new buildings, addition to rolling mill, etc. H. H. Turnbull is secretary of the department.

ORILLIA, ONT. — Canadian Electric Castings Co., Barrie road, will erect plant addition to cost about $25,000, and has given general contract to J. R. Carson.

RENFREW, ONT. — Dominion Magnesium Co., Ottawa, has started preliminary work on new plant to be erected at Haleys near here to cost about $500,000, and has given general contract to Foundation Co. of Ontario Ltd., 1158 Bay street, Toronto.

TORONTO, ONT. — Precision Dies & Castings Ltd., 282 St. Helens avenue, will erect plant addition here to cost about $20,000, with equipment. Plans have been prepared by T. Pringle & Son Ltd., 36 Toronto street.

WELLAND, ONT.—Electro Metallurgical Co. of Canada Ltd., Crowland township, near here, plans construction of plant buildings, repairs to present plant and installation of new equipment to cost about $800,000.

WELLAND, ONT.—Atlas Steels Ltd., Main street East, has called bids through Robert Ian MacBeth, 104 Queen street, St. Catharines, Ont., for construction of metallurgical research building, to cost about $50,000.

WINDSOR, ONT.—Long Mfg. Co. Ltd., 2744 Edna street, has let general contract to Alan Construction Co., 44 Wyandotte street East, for construction of plant addition to cost about $30,000, equipment extra.

LAUZON, QUE.—George T. Davie & Sons Ltd., 27 Davie street, plans further additions to shipyards here at estimated cost of $150,000. At present company is engaged in construction of three shipways and installation of two traveling cranes, plate and angle furnaces and erection of compressor building.

MONTREAL, QUE.—Canadian Car & Foundry Co. Ltd., 621 Craig street West, has let general contract to Foundation Co. of Canada Ltd., 1538 Sherbrooke street West, for construction of addition to propeller plant, 84 x 300 feet, to cost about $125,000, excluding equipment.

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WANTED: EXPERIENCED ROLLING MILL superintendent to take charge of a twenty four inch mill rolling rounds and shell steel. Some experience on alloy steel advantageous. Address Box 632, STEEL, Penton Bldg., Cleveland.

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WANTED: METALLURGIST — CAPABLE of overseeing the production of straight carbon and alloy steel castings—electric furnace—steel foundry located in Eastern Pennsylvania. Prefer a man who is familiar with gamma-raying castings and magnetic testing. In reply state age, experience and salary desired. Address Box 628, STEEL, Penton Bldg., Cleveland.

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Opportunities

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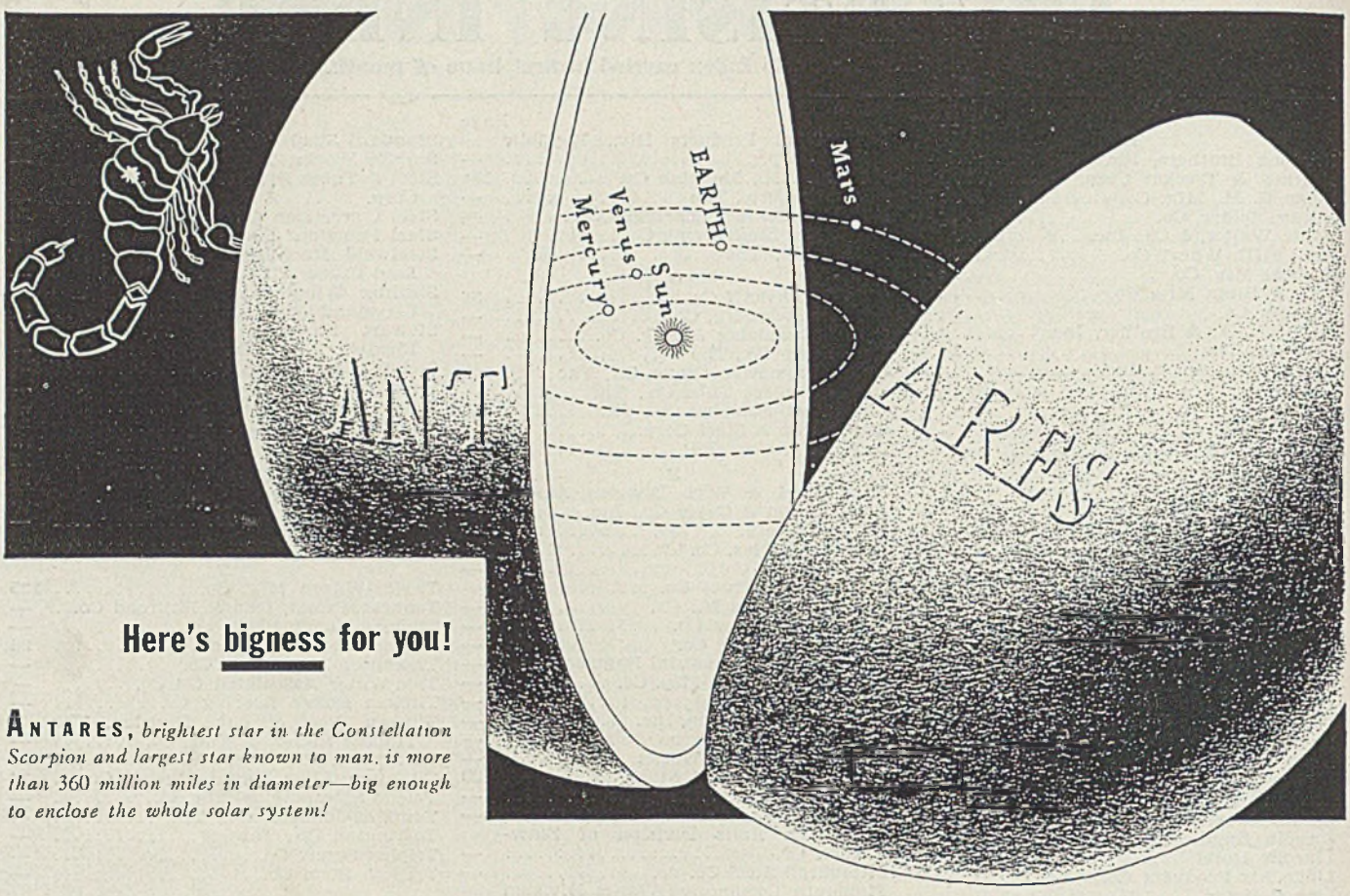
Further particulars may be obtained from an inspection arranged by the Reconstruction Finance Corp., 33 Liberty Street, New York.

ADVERTISING INDEX

Where-to-Buy Products Index carried in first issue of month.

ADVERTISING INDEX

Where-to-Buy Products Index carried in first issue of month.



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