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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 116, NO. 23

June 4, 1945

NEWS

Scarcity of Materials Hampers Reconversion to Civilian Goods Production	75
Canadian Reconversion to Civilian Goods Production Pushed	77
Western Interests Urge Early Action on Fontana Steel Mill	78
Prize-winning Technical Papers Read at Blast Furnace Meeting	79
Baltimore District's War Production Pace Little Changed	80
April Munitions Output Off but Only One Per Cent Behind Schedule	81
Restoration of Freedom Is Held Needed To Remove Business' Fear	82
State Department Hopes to Banish Restrictive Practices of Cartels	88
Light Metals Industry Conference Planned at Seattle June 21-22	97

TECHNICAL

Improved Design Simplifies Stamping of "Butterfly" Cases	104
<i>Fragmentation bomb assembly aided by special jigs and fixtures</i>	
Back-Pack Oxyacetylene Cutting Outfit Extends Utility of Welder	107
<i>Light-weight, portable unit reaches "tight" spots on damaged ships</i>	
Utilizing Gas Immersion Tubes for Industrial Heating	108
<i>Data on design and applications is index to peak efficiency</i>	
Cast and Forged Steels Compared	113
<i>Limited forging of cast blanks sometimes effective</i>	
Using Iron Mortar To Absorb Rolling Mill Vibration	118
<i>Increased strength and controlled shrinkage are provided</i>	
Individual Oil Quenches for Desired Hardness in Machine Parts	122
<i>Ideal is milder flowing quench with proper quantity and speed</i>	
Palletizing Shipments of Cartridge Tanks	126
<i>Labor and material requirements drop, costs cut drastically</i>	

FEATURES

As the Editor Views the News	71	Men of Industry	94
Present, Past and Pending	77	Obituaries	96
Transition Topics	83	Wing Tips	98
Windows of Washington	84	Industrial Equipment	150
WPB-OPA Orders	89	The Business Trend	180
Mirrors of Motordom	91	Construction and Enterprise	200

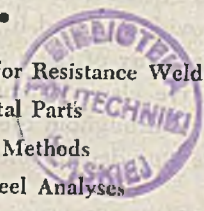
MARKETS

Civilian Steel Prospects for Third Quarter Meager	185
Market Prices and Composites	186

Index to advertisers	216
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NEXT WEEK...

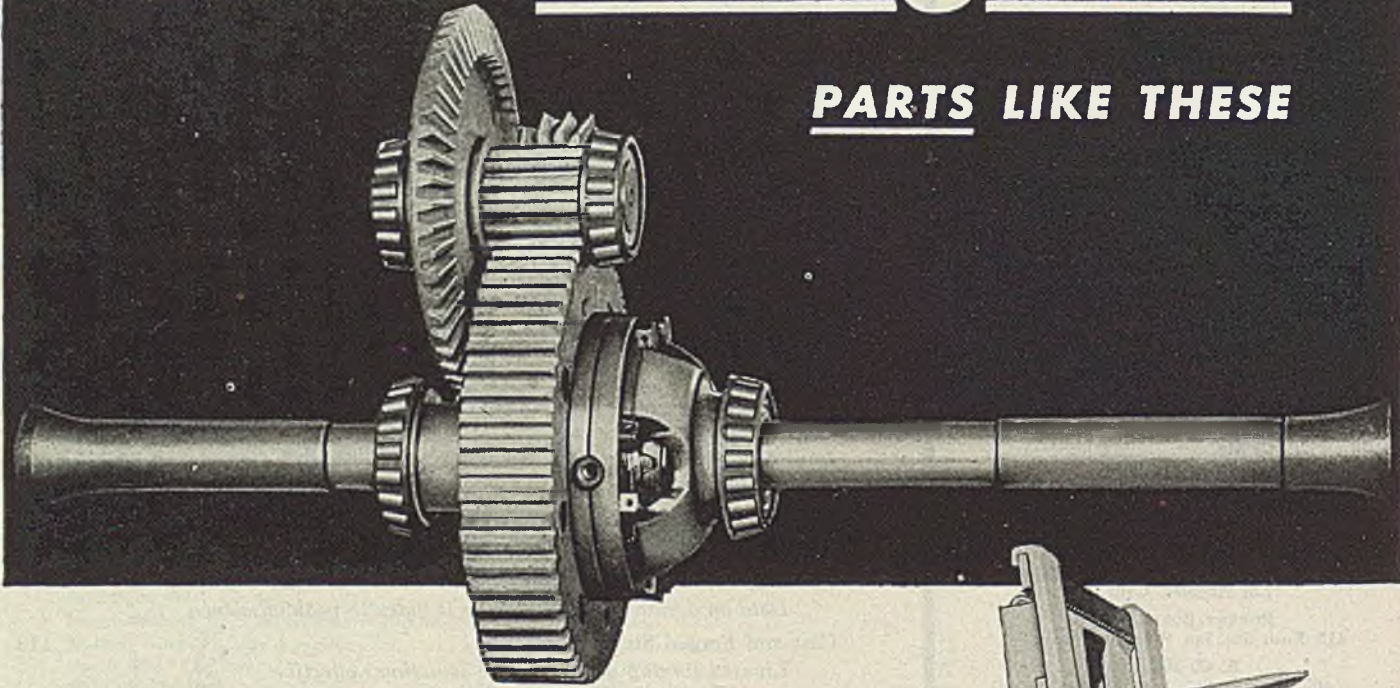
- The Development and Prospects for Resistance Welding
- Corrosion Preventives Protect Metal Parts
- Controlling Quality by Statistical Methods
- How White Motor Co. Checks Steel Analyses
- Four-Zone Conveyor Oven Affords Dust-Free Finishing



**NICKEL
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Strength of steel may be increased by additions of Nickel... without sacrificing ductility... but that's not the whole story.

Nickel additions improve toughness and promote depth hardening in heavy sections. In addition, Nickel intensifies the effect of other alloy elements.

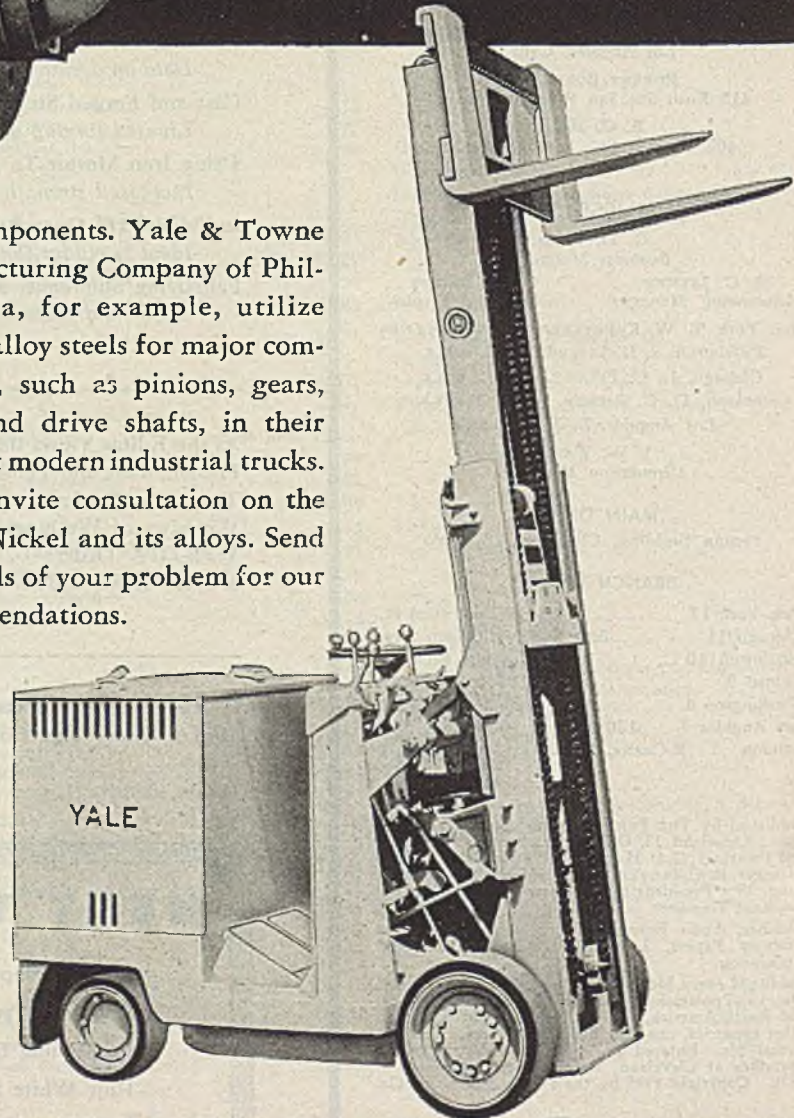
Alloy steels fortified by Nickel have proved reliable for automo-

tive components. Yale & Towne Manufacturing Company of Philadelphia, for example, utilize Nickel alloy steels for major components, such as pinions, gears, axles and drive shafts, in their compact modern industrial trucks.

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Edison Nickel-iron alkaline storage batteries provide a rugged, light-weight power source in many of these trucks. Nickel in the positive elements and Nickel plated steel parts throughout the battery contribute to its long dependable service.



THE INTERNATIONAL NICKEL COMPANY, INC.

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The Reply Diplomatic!

Imagine yourself in this situation: As the head of an industrial corporation you are looked upon in your community as a typical spokesman for industry. You find yourself in a small group of local acquaintances—a dentist, grocer, postman, school teacher, clergyman, garageman and hotel proprietor. One of them asks you what you think about the annual guaranteed wage and your reply will be heard by all members of the group.

Much depends upon the attitude you assume in answering the question. For example, you could reply that an annual guaranteed wage is an "absurdity," is "impossible," or is just the pipe dream of radicals. If you were to give this sort of an answer, your listeners would assume that you not only are definitely opposed to the idea but that you are not interested in its objectives.

On the other hand you could reply that a guaranteed annual wage is being discussed at the present time because people all over the world are interested in a greater degree of security for the individual. You could point out that some persons are advocating a guaranteed income because they think it would produce the stability that is essential to greater security. Then you could add that while you are thoroughly in accord with anything that will contribute to stability of employment, you personally doubt whether a compulsory guaranteed income, imposed by law and applied too soon or too drastically, would achieve that purpose. You could even go into detail as to how such a law might retard the development of stable employment.

If you answered in this last-mentioned manner you would accomplish several desirable things. First, you would raise questions which would cause your listeners to think the thing out for themselves. Secondly, you would impress them with the fact that you are definitely interested in the problem of employment stability. Third, you would convince them that you are not automatically opposed to a proposal because of prejudice against "radical" ideas.

We believe it is important that every business man who may be considered as a spokesman of business be careful in expressing opinions on current political, economic and social issues. The manner of expressing the opinion is as important as the substance of the opinion.

A curt brush-off can do incalculable harm, whereas an intelligent reply—indicating a wholesome interest in the subject—may win converts to sane thinking and will create good will for industry.

FREEDOM AND CREDIT: Testifying before a House sub-committee concerned with the problems of "small business," Walter Siegerist, a St. Louis manufacturer, compared conditions in the depression with those of today in a way which will appeal to thousands of executives.

Mr. Siegerist points out that in spite of the unfavorable conditions existing in the early thirties, many small industrial companies managed to survive, even though they were forced to operate several years under heavy debt and without sorely needed capital. With this splendid record of sur-

vival in mind, asks Mr. Siegerist, why are small business men today so fearful of the future?

His answer is that in the thirties, industrial management had a large measure of freedom. It could plan, price, purchase and sell in a free market. Today management does not enjoy this freedom of action. It fears many of the present controls and restrictions will be continued after the war ends.

These controls hurt the financial standing of small business. Excessive taxes, arbitrarily-fixed prices, one-sided labor policies, tax collecting by employers, renegotiation uncertainties, excessive paper work for

government bureaus and continued extravagant government spending all combine to cause bankers to be concerned about the credit of small enterprises.

This is a powerful appeal for freedom for private enterprise in the postwar period. —p. 82

. . .

ASSOCIATION ATTITUDE: Discussing "Trade Associations and the Antitrust Laws," Wendell Berge, assistant attorney general, made a remark to Washington Trade Association Executives which deserves the attention of everybody identified with industrial association work.

Mr. Berge declared that whether trade associations "shall in the long run contribute to the ultimate salvation of our business life or to its destruction depends to a large degree upon their fundamental attitude: Are they seeking to expand production and distribution at lower costs so that an ever increasing body of consumers can purchase a greater volume of goods at lower prices; or are they seeking to restrict production, regiment distribution, raise prices and corner the profits for that little group that is fortunate enough to belong to the club?"

To get the most out of this pronouncement, think primarily of its economic aspects and try to ignore any political or legal implications which may occur to you. —p. 84

. . .

SLOW START EXPECTED: At the present stage of reconversion it is prudent to take most estimates with a grain of salt. Even the most painstaking surveys produce figures which can be made meaningless by factors too uncertain or intangible to be predicted accurately.

For instance, WPB Chairman Krug estimates that of the 51,200,000 civilian workers, only 6,600,000 are in jobs likely to be affected by cutbacks. He has also given tentative figures on the amount of steel that will be available for civilian goods at stated intervals.

While these and other data may be the best obtainable at this time, they cannot provide a definite basis for planning or for action. Interlocking agency restrictions and shortages in manpower and materials still are too numerous and effective to permit clear-cut progress in reconversion now. But somewhere along the line, the missing pieces of the puzzle will fall into place and the zeal for reconversion will assert itself in a way that will make up for the seeming lack of progress to date. —p. 75

ACCENT ON REPAIRS: Ship repair work is becoming one of the most pressing problems of the war program. The Navy Department states that 30,000 men are needed for repairs (p. 79) on the West Coast alone. The Mare Island and Puget Sound Navy yards could use 9000 and 5000 more workers, respectively, and the Hunters Point dry docks are short 6000 men. . . . Private shipyards in the Pacific Northwest not only are booked to capacity on repairs (p. 97), but are expecting more work when merchant ships are transferred from Atlantic to Pacific duty. . . . In Baltimore, considerable ship reconversion work is in sight (p. 80) as well as a highly sustained volume of ship repair work for an indefinite period. . . . Speaking of repairs, unbelievably effective emergency jobs are being performed under battle-damage conditions in this war. The Navy has in service or on order 13,000 emergency oxyacetylene cutting outfits weighing only 56 pounds and contained in a fire-resistant canvas pack which can be carried by one man. Equipped with this outfit (p. 107) a man can crawl through narrow passages, cut through jammed compartment doors and cut away tangled steel wreckage. Gas capacity of one unit of cylinders will cut 225 lineal inches of 1-inch steel plate. . . . Several 440-foot Liberty ships have been converted by the Air Technical Service Command into floating B-29 repair shops. Anchored at strategic points in the Pacific (p. 98), they are performing "fourth echelon maintenance" or complete and heavy overhaul of aircraft accessories. . . . The War and Navy Departments are seeking to negotiate pre-termination agreements with steel companies to facilitate the rapid settlement of terminated war contracts. Of the 19 integrated steel companies involved in the present program, eight will be handled by Ordnance and six by the Corps of Engineers of the War Department (p. 85), while three will be handled by the Bureau of Ships and two by the Bureau of Ordnance of the Navy Department. . . . RFC is under strong pressure to make a decision affecting the Fontana steel plant. The agency can accept Mr. Kaiser's plan for refinancing the RFC loan, in which case he could retain title to the property for postwar operation (p. 78), or it can foreclose the loan and offer Fontana to the highest bidder.



EDITOR-IN-CHIEF



How Ryerson Assures Alloy Steel Quality

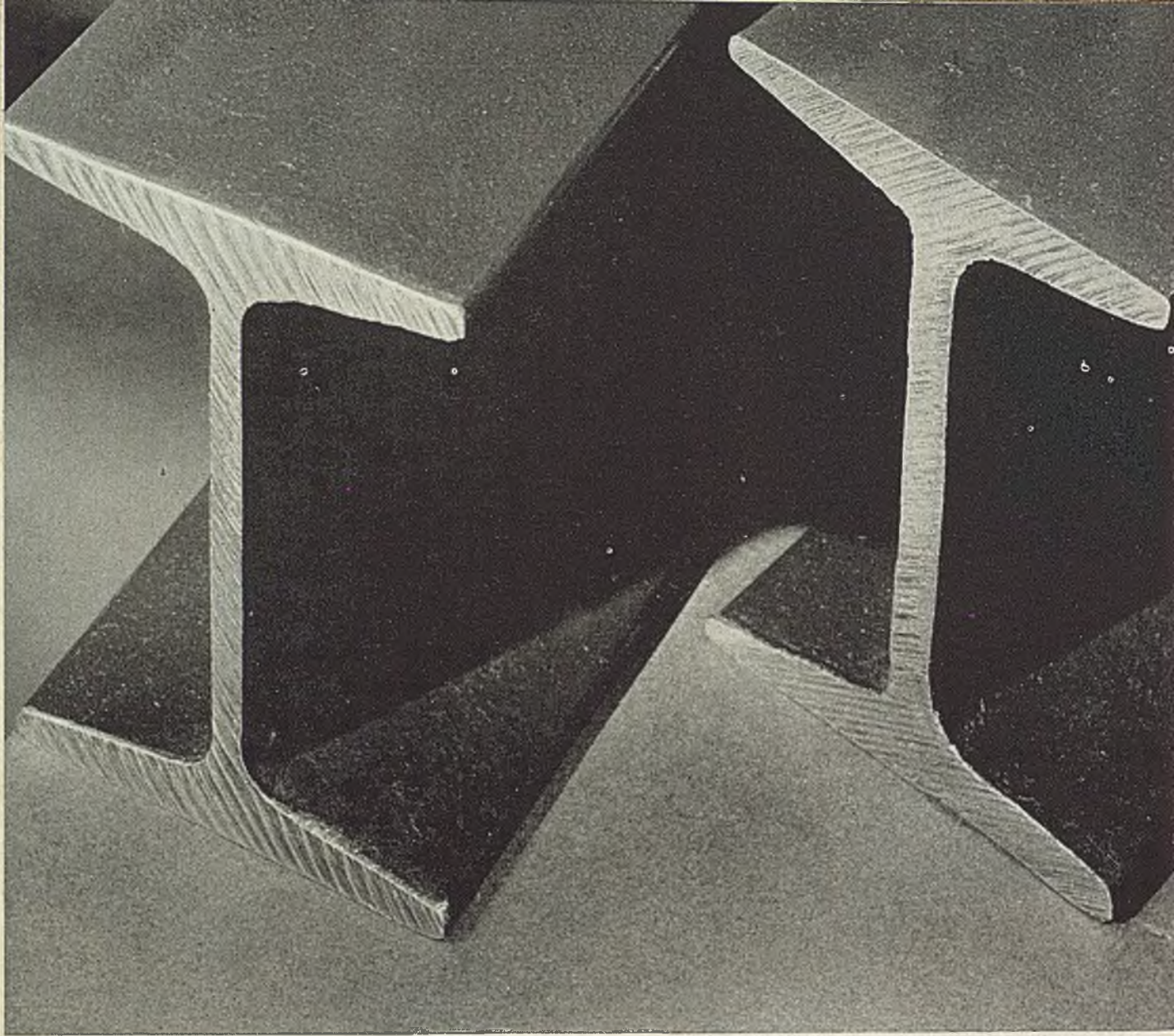
Each alloy shipment is personally inspected and tagged as a part of a rigid quality control system, which we call the Ryerson Certified Steel Plan. This plan covers: selection of the individual heats of alloy steel, the testing of samples from each heat, the positive identification of every alloy bar with stamped heat symbol and painted color markings (or with metal tags), and a Ryerson Alloy Steel Report, which is sent with each shipment. This report shows complete test information for the particular heat of steel used in filling your order. It contains: chemical analysis, recommended working temperatures, the Jominy hardenability results, and an interpretation of

physical properties for 1, 2, 3 and 4 inch rounds quenched and drawn at 1000°, 1100° and 1200° F. The report serves as positive identification, a check on quality and as a guide to satisfactory heat treatment.

The Ryerson Inspection Tag symbolizes the final culmination of our quality controls, because it places a personal responsibility on us for the fulfillment of every specification in your order. This is the Ryerson way of making sure that you get the right steel. Ryerson alloys all receive the same systematic care. Call Ryerson for alloy steels, or for any other type of steel, and be assured of uniform quality and prompt action.

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IN structural, as well as in all other rolled forms of steel, Inland engineers are aiding steel users with cost-reducing and time-saving suggestions. Whether the design is for a bridge, skyscraper, dam

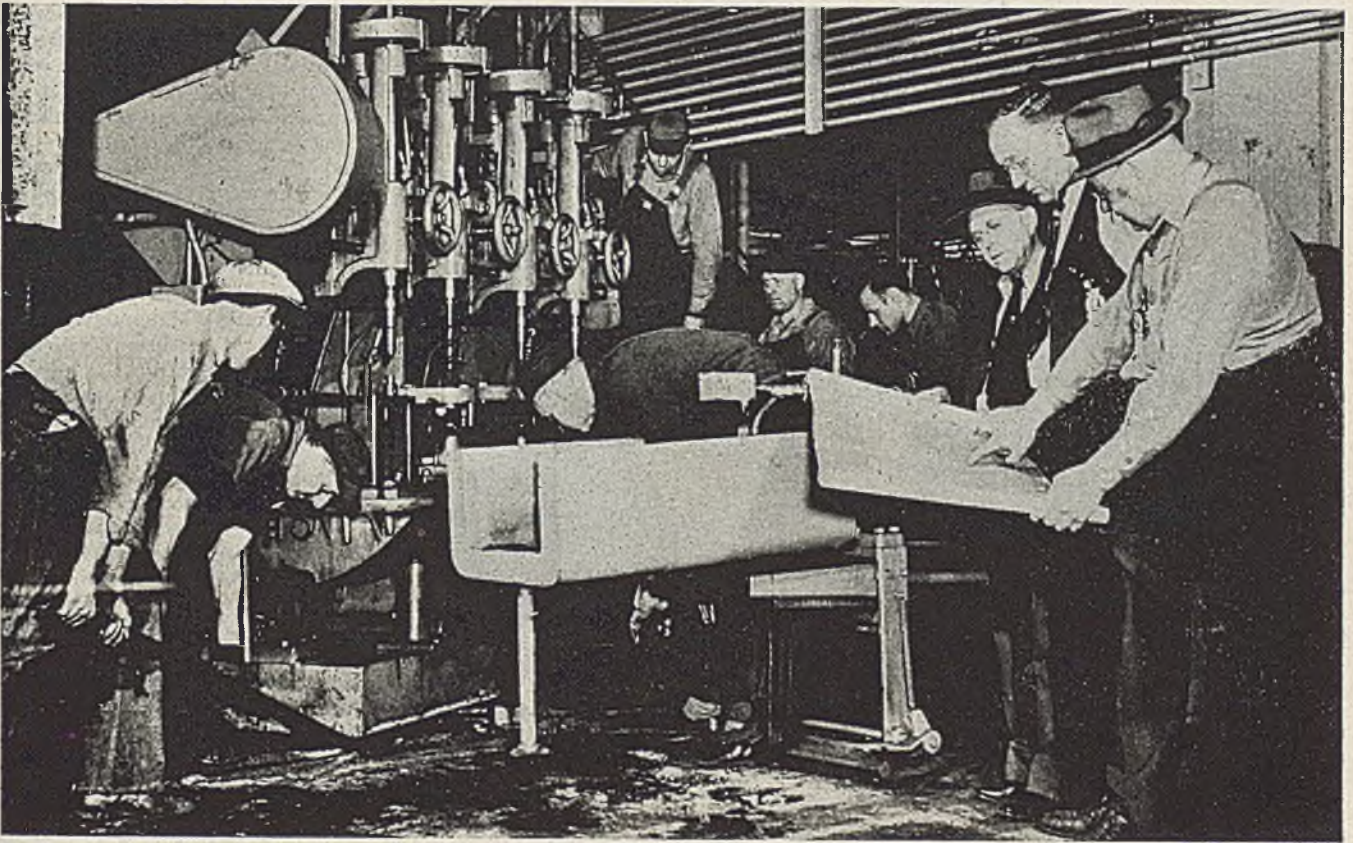
or mechanical equipment you can count on Inland to work closely with you from blueprint to finished job. This kind of mill service can make a big difference in production schedules and profit margins.

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BARS FLOOR PLATE PILING PLATES RAILS REINFORCING BARS SHEETS STRIP STRUCTURALS TIN PLATE TRACK ACCESSORIES



Blueprints made months ago by Hudson Motor Car Co. in anticipation of the go-ahead signal for reconversion are being used here to move a drill press to the spot where it is needed to help produce passenger automobiles. NEA photo

Transition to Civilian Output Slow

Scarcity of materials large obstacle in resumption of peacetime manufacture. Manpower, tools and continuing war agency restrictions also hinder, but durable goods output within year to exceed 1939 level by 30 per cent

METALWORKING companies, freed from war production obligations and seeking to resume the manufacture of civilian goods, are finding themselves in much the same position as the housewife with a handful of red points attempting to purchase a prime standing rib roast and a few choice steaks. The authority is there but the material is scarce.

Many of the War Production Board's limitation and conservation orders have been revoked or soon will be. Machinery has been set up to aid industries returning to civilian goods production obtain materials and machines. However, many of these materials and tools are in short supply. The military cutbacks have not affected the backlogs of steel companies, for example, in as pronounced a manner as was anticipated, and prospects for rolling much unrated tonnage in most products during the third quarter are not bright.

Tools for reconversion are short and for some months will continue to hinder the changeover.

Although WPB has been lifting its restrictive orders in wholesale fashion, manufacturers still are hampered by the restrictions of other war agencies. For example, War Manpower Commission regulations still in effect prevent the free flow of workers to areas and industries where jobs in civilian goods industries are or soon will be available.

The slowness in translating the potentials of materials, manpower and facilities no longer needed for a two-front war into civilian production is not unexpected. Partially it stems from uncertainty as to what the future military demands will be and a justified caution on the part of war procurement agencies against releasing too much capacity for peacetime output. Partially it is due to the interlocking controls of the various agencies, and the

natural cumbersomeness of bureaucratic organizations. Partially it is due to dislocations caused by the war; most of the materials, labor skills and facilities may be available to produce a civilian item, but a shortage in one or two critical components may delay the whole program.

Cutbacks in the military program have not yet appeared in the volume anticipated. Although the programs are being revised in accordance with plans of the war procurement agencies, these revisions are slow to be translated into cancellations. The mechanics of clearing cancellations through interested war agencies is an important retarding factor.

However, such cutbacks are increasing in volume. Significant is the reduction in the aircraft program of 17,000 planes over the next 18 months, the largest single armament slash since V-E Day. This may release 450,000 workers by the end of the year and will release considerable quantities of metals for civilian production. Aircraft production, which until recently was estimated running at about \$20 billion annually, was cut down by \$3.5 billion before V-E Day and the latest cut reduces the program by a similar amount. The Ford-operated Willow Run plant,



Representatives of the United Automobile Workers-CIO journey to Washington to confer with the President on the problem of unemployment among auto workers in the Detroit area. Pictured leaving the White House are: President R. J. Thomas, UAW; Frank Winn, a member of Thomas' staff; W. G. Grant, president of the Ford local; Matthew Hammond, another local president. NEA photo

volume of munitions production over the coming months can be accomplished more easily than was the case in former years. Fewer men and less material will be necessary and more men and materials can be released for civilian output.

According to WPB estimates, direct military requirements for carbon and alloy steel will drop from more than half of total production to about one-third by the fourth quarter of this year. Copper requirements will drop even more. In fact, the Controlled Materials Plan for brass mill products has been open-ended for unrated orders five weeks in advance of the July 1 date set for the general release of controlled materials on unrated orders.

More small electrical motors will become available soon, easing a critical problem for many civilian goods makers.

On the other hand, many materials will continue in extremely short supply. Textiles and leather will be tight. Gray iron castings will be short. Materials for containers will be scarce and producers of civilian items may be hard pressed to find containers in which to ship their products.

Even in materials in which critical shortages do not exist, a considerable period will be required to fill the pipelines for civilian production just as time was consumed in preparing for war.

Idle manpower already is appearing in the wake of military cutbacks and pocket unemployment is causing concern in union and some government circles. Here the problem as yet is not an overall excess of manpower, but idle workers in boom munitions centers, while other centers have manpower shortages. This problem is certain to be aggravated as the transition develops and will cause plenty of headaches.

However, the great majority of civilian workers will not be required to shift jobs during the reconversion period and the very process of reconversion will help in re-employing released workers. As munitions contracts are cut back in volume, a

(Please turn to Page 199)

originally scheduled to close Aug. 1, now will cease operations June 30.

War Production Board Chairman J. A. Krug promises sharp new cuts in the armament program over the coming weeks. He estimates the war machine will need 2,900,000 fewer workers three months from now and that in six months the number of persons engaged in war activities will have decreased by 4,800,000, including 1,000,000 discharged servicemen.

Mr. Krug is optimistic that much of the materials and manpower released by coming cutbacks will be quickly absorbed in an expanding civilian economy. Today the production of durable consumer goods for the civilian economy is at a rate slightly under \$7 billion annually. A year from now, assuming that present estimates of war requirements hold, output of durable consumer goods for civilians should rise to \$16.7 billion, or about 30 per cent more than was produced in 1939 (see accompanying chart).

A tremendous demand for these civilian goods is expected to spur maximum initiative and ingenuity on the part of manufacturers in producing the greatest possible amount of goods with the available materials and resources. WPB statistics indicate that in 1944, if goods had been available, people would have spent close to \$120 billion whereas they actually spent only \$98 billion. Likewise in 1942 and 1943, huge demands for civilian goods went unsatisfied. This pentup demand is the foundation on which WPB is banking for a strong transitional economy.

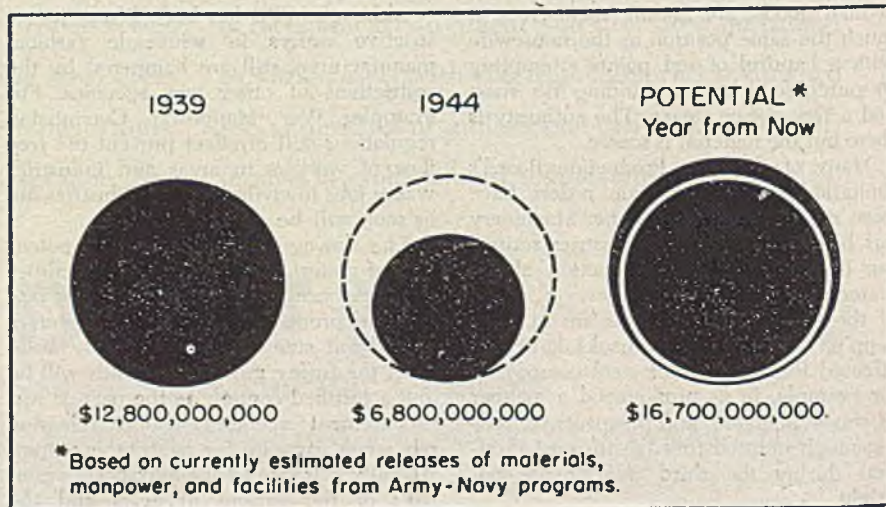
The major problems to be confronted in getting back into civilian production are the same problems confronted in

reaching peak war production: Materials, manpower, tools and facilities, and government controls.

The munitions program for the eight months following V-E Day, according to current official plans, will run at an annual rate of \$54 billion. This is two-thirds again as much as in 1942, almost equal to the amount in 1943, better than nine-tenths the rate in 1944 and equivalent to 90 per cent of total value of manufactured goods in 1937.

This makes the future war program appear very large. However, it must be remembered that the munitions production program is now mature and that it no longer is necessary to build gigantic new plants or convert old ones or to train vast numbers of new workers. The large

DURABLE GOODS—PREWAR, 1944, YEAR FROM NOW



Reconversion to Civilian Goods Production Pushed in Dominion

Swing from war to peacetime production so far on small scale but many plants are expected to be in high gear on civilian products before end of the year. Auto reconversion in step with that in U. S.

WITH conversion of Canada's industry from war to peace activities as announced by C. D. Howe, Minister of Munitions and Supply, iron and steel buying in the Canadian markets is being more definitely tied to production of consumer goods.

While the swing from war to peace production schedules has been on a small scale up to this time, it is gradually expanding and the minister stated that many plants will be in high gear on civilian production before the end of this year.

While he could give no actual date as to when passenger car output would be under way, he stated that these cars will be rolling off the lines before the first snow falls in 1945 and plants will operate at peak production throughout 1946.

"The first automobile will be produced in Canada about the same day the first automobile is produced in the United States," said Mr. Howe. He continued that the conversion from war to peace was already 50 per cent completed in Canada and there are 5000 more unfilled jobs in Canada than one year ago.

Wysor To Supervise German Metallurgical Operations

The Allied Control Council announced in Paris last week that R. J. Wysor, who until recently was president, Republic Steel Corp., Cleveland, has been named to supervise metallurgical operations in Germany. German steel mills will be controlled, dismantled or moved and Mr. Wysor will serve among a group of leading American civilian and Army officers appointed to carry out United Nations' policies in controlling Germany's economy.

Dr. Calvin B. Hoover, dean of Duke University Graduate School, has been named head of the intelligence group for the council. He will also serve as special advisor to Brig. Gen. William H. Draper, chief of the Economic Division. Other experts named are: Edward S. Zdunek, formerly head of General Motors at Antwerp, Belgium, to supervise the Engineering Section; Philip Gaethke, formerly of Anaconda Copper Mining Co., will direct all mining operations in the United States occupation zone; Philip P. Clover of Socony Vacuum Oil Co. will be chief of Oil Section; Dr. W. O. Sreeling, Allentown, Pa., consulting chemical engineer; Laird Bell, chief counsel for the Eco-

nomie Division; Lloyd Steers, special advisor on food and agriculture; Col. James Boyd, chief of a branch to control industrial production; Peter Hoglund to serve as Col. Boyd's deputy, and Col. Maurice R. Scharff to head the Requirements and Allocations Branch and to pass on raw materials and components permitted the Germans.

Nonintegrated Producers Press for Price Relief

Nonintegrated steel producers plan to intensify their efforts to obtain relief from the steel price schedules set up by

the Office of Price Administration May 23. At a meeting last week the Committee of Nonintegrated Producers reaffirmed its view that the increases allowed the steel industry by OPA were inadequate to meet the losses now burdening the industry, especially the smaller companies.

The committee plans to prepare a brief to submit to the Senate Committee on Banking and Currency seeking amending of the price control law so that OPA would be required to consider all cost factors in determining the extent of price relief granted an industry.

Membership of the committee has been enlarged and now consists of: Lauson Stone, president, Follansbee Steel Corp., Pittsburgh; Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa.; R. K. Clifford, vice president, Continental Steel Corp., Kokomo, Ind.; David Thomson, president, Phoenix Iron Co., Phoenixville, Pa.; E. L. Parker, president, Columbia Steel & Shafting Co., Carnegie, Pa.; John Hosack, vice president, Mahoning Valley Steel Co., Niles, O.; D. V. Sawhill, president, Mercer Tube & Mfg. Co., Sharon, Pa.; and J. D. Streett, assistant to president, Granite City Steel Co., Granite City, Ill.

Present, Past and Pending

■ FORD MOTOR TO BUILD ATLANTA ASSEMBLY PLANT

DEARBORN, MICH.—Ford Motor Co. has purchased an 82-acre site near Atlanta, Ga., to be used for a postwar assembly plant and parts depot.

■ STEEL WAREHOUSE STOCK REPLACEMENT PLAN SET UP

WASHINGTON—A new plan to enable steel warehouses to replace their stocks will become effective July 1, through issuance of direction 3 to order M-21, WPB has announced. It establishes seven groups of products under which warehouses must collect CMP allotments for the purpose of ordering stock replacements, if they wish to order on an authorized controlled materials order basis.

■ STRIKES HIT RECORD IN 1944; LOST TIME LOWER

WASHINGTON—There were 4956 strikes and walkouts in 1944, involving about 2,116,000 workers, Bureau of Labor Statistics reports. Stoppages were most extensive in the automotive industry, iron and steel and mining. While the number of work stoppages established a new high, lost time was lowest on record.

■ HIGH PRIORITY GIVEN DRAINAGE EQUIPMENT FOR HOLLAND

WASHINGTON—WPB has assigned high priorities to \$5 million worth of equipment needed for draining large areas in Holland. Some of this equipment will be used by the Allied military forces, some purchased for cash by the Dutch, and some provided by the United States as lend-lease.

■ GENERAL KNUDSEN RESIGNS ARMY POST

WASHINGTON—Lieut. Gen. William S. Knudsen has resigned his Army post as of June 1. For the past five years he has been one of the foremost figures in the organization and development of the war production program.

■ BRETTON WOODS SUPPORTERS PREPARE INDUSTRY REPORTS

WASHINGTON—Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., has announced, as chairman of the nationwide committee of businessmen to support the Bretton Woods agreement, preparation of a series of reports on various industries, one of which covers the machine tool industry.

■ GENERAL MOTORS TO BUILD 90,000 CARS IN 4TH QUARTER

WILMINGTON, DEL.—General Motors Corp. does not plan a \$500 automobile, Alfred P. Sloan Jr., chairman, said last Thursday. The corporation will build 90,000 passenger cars in fourth quarter of 1945.

Urge Early Action on Fontana Mill

Federal government pressed for prompt ruling on terms for postwar operation of war-born works

RAPID approach of conversion from war to peace has brought a flurry of activity in far western political and other quarters to force early federal government action on terms for postwar operation of Henry J. Kaiser's steel mill at Fontana, Calif.

During the last few days these developments have occurred, in rapid-fire order:

1. The California congressional delegation has urged the federal loan administrator to act immediately in arranging financing terms with Mr. Kaiser.

2. The Senate and Assembly of the California legislature have passed a joint resolution calling on the federal government to provide for the "prompt reconversion" of the Fontana steel mill to peacetime uses.

3. Governor Earl Warren of California made a similar request in a formal public statement.

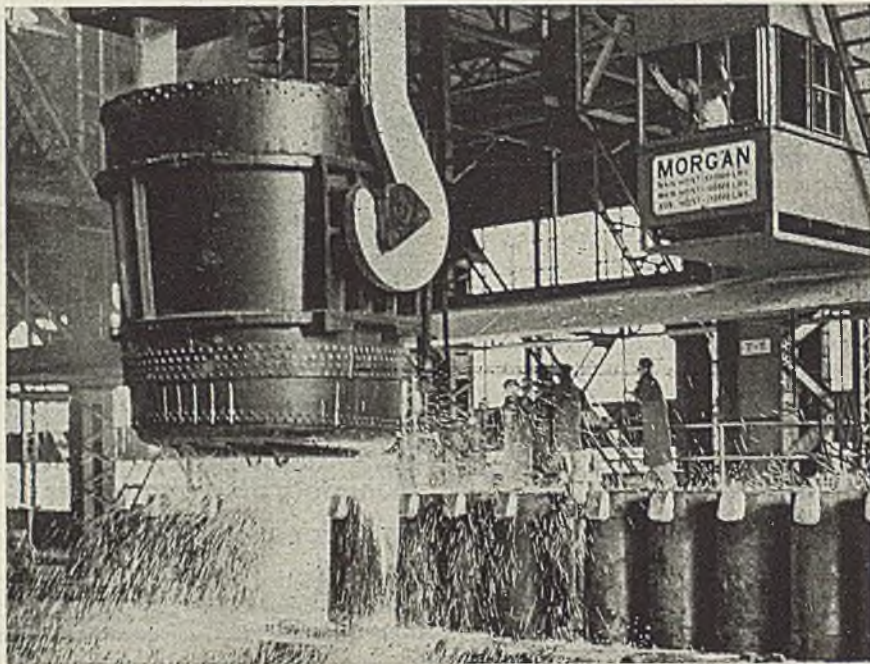
4. Mr. Kaiser disclosed that conversion of the war-born plant to peacetime uses would require an additional investment of \$52 million. These funds would be spent to provide facilities for making tin plate, light sheets, a pipe mill and certain other improvements necessary to reduce costs of operation.

5. The Bank of America announced it is ready and willing to join with other far western banks to provide \$60 million, with RFC underwriting, in order that working capital for peacetime conversion of Fontana can be undertaken.

Depends on RFC's Decision

Cruz of Fontana's immediate future is the RFC's decision on refinancing or disposing of the plant. There are two alternatives: Mr. Kaiser's plan for refinancing the RFC loan could be accepted and Mr. Kaiser would retain title for postwar operation. Or, secondly, the loan could be foreclosed and the mill taken over by the RFC which then could offer it to the highest bidder as surplus property.

To establish the plant as a going concern, the RFC loaned Mr. Kaiser \$111 million, of which approximately \$95,500,000 was spent for actual construction and the remainder for contributing facilities and supplies. Of the total loan, Mr. Kaiser has repaid about \$27 million on principal and has paid interest of about \$8,600,000. These funds were derived from earnings of the Kaiser shipyards. By the time the shipbuilding program is completed, Mr. Kaiser expects to amortize \$40 million of the loan, leav-



Henry Kaiser's steel mill at Fontana, Calif., is the subject of much speculation with respect to postwar operation. Above is shown molten steel being poured by the ladle crane operator at the plant, which was the first integrated steel mill west of the Rocky Mountains. Construction of the works was partly financed with an RFC loan. NEA photo

ing unpaid principal of \$71 million.

What plans have been offered to the RFC for refinancing this loan have never been disclosed by Mr. Kaiser. The proposed loan of \$60 million by the Bank of America, and others, would be only for postwar improvements to the plant. The amount necessary to refinance the original RFC loan would have to be an additional operation, unless an arrangement is made with the RFC to refinance on the basis of amortizing the loan out of future earnings.

Possibly one reason behind the recent concentrated campaign to bring quick RFC action on the matter is unofficial reports that order backlog of the Fontana mill for the third quarter this year has dwindled sharply and the mill may have to close partially or fully within the next few months. This is said to be only a temporary situation, however, as there are indications of increased orders for later months of this year.

The statements of proposed action voted by both the California congressional delegation and the California legislature follow a similar pattern. The appeal is made on the basis that the Fontana mills' continued operation is necessary to provide the Far West with an industrial foundation and as a bulwark against postwar unemployment. The resolutions also decry any action which would put Fontana in the hands of eastern interests.

In its statement, the congressional delegation said:

"The steel plant at Fontana will be of major importance in helping to create jobs. Already enormous cutbacks are taking place in industry. The people of California need to know at once that we are going to have a steel plant of our own that will allow the planning of new industries.

"Time is most important for the purpose of providing the employment not only at Fontana but in its related industries at a time, now here, when it will be needed. Further, there would be the extreme hazard of Fontana falling into the hands of interests that would not serve the objectives which we, in the West, are seeking.

"We are not urging that any action on Fontana be taken to the exclusion or detriment of any of the government's best interest in the Geneva steel plant or any other private or government-owned steel facility. We do recognize, however, that the problems of Geneva are many and particularly that its ultimate use will depend on drastic reduction of existing freight rates. This, we realize, may take months to accomplish. Therefore, we feel that any action on Fontana should be handled separately and without relation to what must ultimately be done to the Geneva plant. Action on Fontana is required now.

"We understand that Kaiser Co. has

Prize-winning Technical Papers Read at Blast Furnace Meeting

Chicago district group hears discussions on gas flow and coke consumption, furnace repairs, use of lumnite cement and setting of stack drafts. H. V. Lauer elected president of association. Other officers named

presented a suggested plan for the construction of additional facilities at Fontana together with a plan for financing. This objective for Fontana is in keeping with ours, namely, to keep Fontana in the hands of the present operators, to provide the West with additional steel products at prices that will be less than the so-called differential, and thereby be of benefit to the West. We appreciate that an ultimate alternative to working out an equitable financing arrangement with the present operators would be possible foreclosure by the RFC and sale or other disposition of the Fontana property to some established steel company. The time alone involved in such procedure would require many months during which the facilities would be entirely idle. No constructive good would be served, and it would be a definite loss to the West."

Legislature Makes Appeal

The California legislature's resolution covers five basic points as follows:

"1—That the prompt conversion of the Fontana steel plant to uses which will serve the peacetime industrial needs of California and the western states is vital to the effort to achieve orderly post-war adjustment and full employment.

"2—That agencies and officers of the Federal government concerned with policies affecting this plant be urged to give early and thorough consideration, in such policies, to those which would create for this plant a normal and permanent status in our economy.

"3—That full consideration be given by such agencies and officers to insuring the operation of this plant under reasonable competitive conditions and under management policies which will give adequate consideration of the needs of western industrial development.

"4—That in the reconversion of this, as well as other western war industries, the fullest consideration be given to programs which contemplate the continued operation of these plants by those who pioneered them, not only as a recognition of what they have done to balance our economy, but also as additional assurance to the people in interdependent enterprises that a determined effort will be made here in peacetime to perpetuate and expand the opportunities which they have created.

"5—That the federal government act immediately on a conversion policy for the Fontana plant and other basic western industries."

Up to now all indications have been that the RFC considers Geneva a more important matter than Fontana, possibly because Geneva which cost twice as much as Fontana is wholly owned by the government. It has been operated throughout the war by United States Steel Corp. U. S. Steel, Colorado Fuel & Iron Corp. and Mr. Kaiser have signified their intentions of bidding for Geneva. U. S. Steel also has stated it may seek to buy the Fontana plant.

FOUR papers which won awards in its fourth annual technical papers contest were read in abstract at the third regular 1944-45 meeting of the Blast Furnace and Coke Association of the Chicago District held recently at Hotel Del Prado.

The competition is sponsored for the benefit of the younger members and men employed by industries represented in the association, with cash awards of \$100 for first prize and \$50 for second prize in the blast furnace and coke plant divisions, respectively.

"Observations on Gas Flow and Coke Consumption in the Blast Furnace" was the title of the paper which won for Kurt Neustaetter, blast furnace practician, Inland Steel Co., East Chicago, Ind., the first prize in the blast furnace division. In his contribution, the author reported a lengthy series of observations taken to determine the cause of repeated furnace kicking. These kicks occurred in months of poorest coke consumption. Remedy appears to rest in using more coke, thereby raising top temperature, and to regulate stack charging to improve gas flow.

Describes Time-Saving Repairs

Robert V. Huffman, superintendent's clerk, Blast Furnace Department, Youngstown Sheet & Tube Co., East Chicago, Ind., won second place in the blast furnace division with a paper "Unusual Repairs to Blast Furnace Stove." In this contribution, the author described how a stove badly deteriorated internally was repaired in a unique manner at a considerable saving in time and labor.

The procedure involved making two side holes through which the bottom was cleaned out, the checker work supported by timbers suspended on cables dropped from the top, subsequent shoring up the checker work with heavy timbers, then rebuilding the arches. Job was done in such a manner from the outside that no worker entered the stove until all hazard of falling masonry had been eliminated.

Taking first prize in the coke plant division was a paper "Developments in the Use of Lumnite Cement at Gary Works," by James E. Ludberg, patcher foreman, Coke Division, Carnegie-Illinois Steel Corp., Gary, Ind. The author described chiefly the making of monolithic linings for cast iron and fabricated steel coke oven doors which have lasted as long as nine years, but also included miscellaneous applications of the material for general patching around inspection holes,

lining ascension pipes, and casting special shapes.

J. R. Purdy, general turn foreman, Colorado Fuel & Iron Corp., Pueblo, Colo., was author of second prize paper in the coke plant division, its title being "Setting of Stack Drafts on Combination Cross-Regenerator Ovens." The procedure Mr. Purdy outlined is used on Koppers-Becker ovens underfired with coke oven gas. He pointed out that adjusting the butterfly valve on one regenerator affects the draft on the other regenerators in the series, making equalization difficult and time consuming. However, when four direct-reading draft-recording instruments are employed, three men can set the drafts on a whole battery in 2 hours.

H. V. Lauer, assistant division superintendent, coke plants, Carnegie-Illinois Steel Corp., Gary, Ind., was elected president of the association to succeed T. F. Plimpton, superintendent of blast furnaces, Inland Steel Co., Indiana Harbor, Ind. Mr. Lauer has been serving as vice president. Secretary-Treasurer C. M. Horan, assistant superintendent of blast furnaces, Youngstown Sheet & Tube Co., East Chicago, Ind., was advanced to vice president, and Walter Deveney, general superintendent, Crawford Station plant, Peoples Gas, Light & Coke Co., Chicago, was named secretary-treasurer.

Navy Ship Repair Labor Shortage Acute on Coast

Urgent need for 30,000 skilled, semi-skilled and unskilled workers for (naval) ship repair work on the Pacific Coast was broadcast last week by the Navy Department. Without revealing definite figures as to the amount of repair work to be done, Navy officials stated some \$300 million in new ship construction had been transferred to East Coast yards to release West Coast facilities for repair work.

Workers are reported quitting their shops in Pacific repair yards in the face of the existing manpower shortage and increasing work load. It is pointed out the Mare Island (Calif.) Navy yard lost 600 net workers last month and is some 9000 workers short. Puget Sound (Wash.) Navy yard is some 5000 short and lost 600 net last month. Hunters Point (Calif.) Naval dry docks is short 6000 workers and lost 700 net last month. The situation in private yards is described as comparable.

District's War Production Pace Little Changed

Few plants in industrial area yet hit by important military cutbacks. Peak operations limited only by labor shortage

WAR industries in the Baltimore area continue to absorb steel at a high rate. In fact, war work in the district continues at a peak limited only by a shortage of labor. So far there have been relatively few cancellations and where they have developed they have led to a comparatively small cutback in each case from both the standpoint of steel required and the amount of labor relieved.

For instance, one company has had a cutback in caps for 105 mm. shells, and while the company is now planning to lay off 45 per cent of its workers, this percentage will involve less than 100 persons. Another similar case may be cited in the recent cancellation of an order for gun shields and still another in a cutback now in prospect at one plant in shell casings. This latter cutback is likely to develop this month and at most will not result in the laying off of more than 75 employees. As indicated, the steel and metal cancellations in these instances will involve relatively small tonnages.

It is believed at present there will be few really important cutbacks in either steel or labor until ship or aircraft work begins to slump. The prospect as to shipbuilding is that there will be no important curtailment in operations before late October. At that time work at the Bethlehem-Fairfield yards may begin to taper sharply with the program there winding up around the end of the year, according to present indications. However, there is still considerable ship reconversion work in sight, to say nothing of a highly sustained rate of ship repair work for an indefinite period.

No Cutbacks at Aircraft Plants

As for aircraft work, the two aircraft companies in this district are both engaged on Navy work and so far there have been no cutbacks nor are any reported under early contemplation.

Incidentally, it is reliably stated, 85 per cent of the war work in the Baltimore industrial area is comprised of shipbuilding, aircraft, steel production, communications and chemicals. It is estimated about 240,000 employes are engaged in the area's war industries. This compares with a peak of approximately 250,000 some time ago, the decline being accounted for by the migration of various workers back to their homes out-



Works of the Rustless Iron & Steel Corp., one of the leading producers in the Baltimore area, as seen from the air. Company produces stainless steel semi-finished, bars, rod and wire. NEA photo

side the district, and not by any slackening in demand. In fact, the largest steel producer in this area alone could use at least an additional 5000 or 6000 men.

While the most important cutbacks in steel and labor will occur when shipbuilding and aircraft work start declining, curtailments sooner or later in certain other lines of war activity will be felt, and possibly within the next 30 to 60 days, for it is admitted that Army cancellations to date have not as yet been on anything like the scale that was at one time anticipated, once the war in Europe was over. This is ascribed in part to the fact military officials still do not know how much equipment in Europe can be salvaged in meeting the Far Eastern requirements and also to the fact that these later requirements cannot at the moment be definitely gaged.

One program especially active in this district, along with shipbuilding and aircraft, is the rocket program, with important prime contracts being handled here along with numerous subcontracts. Communications industries also continue particularly active; also manufacturers of miscellaneous types of small machinery equipment.

Canning season is fast approaching, with labor a bottleneck. Two district canmakers for the first time are now employing prisoner of war labor in their fabricating operations. War prisoners have been used here before in the picking and canning of crops and are still being used but a shortage of help still prevails. General line can manufacturers are especially hard hit for the reason that they have secondary labor ratings.

Locally, building construction is confined to small miscellaneous projects, which in the aggregate amount to a fair tonnage. Much of it is of a rush character, with the result that warehouses are having difficulty in keeping their stocks of structurals in balance. Incidentally, distributors report continued brisk business in general, although not quite up to last month's rate.

The largest structural job figured here recently by fabricators involved 1640 tons for the Aquia river bridge of the Richmond, Fredericksburg & Potomac railroad, just placed with the American Bridge Co. Bids are being asked on 300 tons for the remodeling of the roof of a large shop at the Glenn L. Martin Co., also pending are 250 tons for a naval ordnance laboratory at White Oak, Md., bids having been opened June 1.

An eastern Pennsylvania shape mill has received an order for 14,000 tons for shipment under lend-lease to Europe for rehabilitation purposes.

An outstanding reinforcing bar award involved 830 tons for the George Washington Hospital addition, Washington, placed through C. H. Tompkins, that city, with Bethlehem Steel Co. The Tompkins company also is inquiring for 275 tons for the Cherryville Hill housing project in the Washington area.

Alloy Steel Output in April Shows Decline

Alloy steel production in April totaled 918,378 net tons, compared with 992,143 tons in March, according to the

April Munitions Output Off but Only 1 Per cent Behind Schedule

American Iron and Steel Institute. For four months alloy output aggregated 3,680,939 tons. The April total was made up of 595,695 tons of open-hearth ingots and 322,683 tons of electric furnace ingots. Hot-topped carbon ingots in April totaled 1,415,930 tons from open hearths and 10,034 tons from electric furnaces. Hot-topped ingots in March totaled 1,479,123 tons.

Alloy steels considered in this report include stainless and any other steel containing one or more of the following elements in the designated amounts: Manganese over 1.65 per cent, silicon over 0.60 per cent and copper over 0.60 per cent; also steels containing the following elements in any amount specified or known to have been added to obtain a desired alloying effect: Aluminum, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium and other alloying elements.

Steelworkers To Seek 20 Per Cent Basic Wage Boost

Executive board of the United Steelworkers of America (CIO) last week called for immediate revision of the national wage policy to permit an increase in basic wage rates of at least 20 per cent.

In a resolution the board said the immediate future of the steel industry promises continued cutbacks and cancellations, and even if reconversion were to proceed with speed there would still be involved a serious cut in weekly wages for steelworkers due to the discontinuance of the 48-hour work-week.

Steel Company Distributes Increase in Vacation Pay

May payrolls of Allegheny Ludlum Steel Corp., Brackenridge, Pa., were swelled by \$175,000, representing a retroactive increase in 1944 vacation pay.

Nearly \$127,000 of this total was distributed at the Brackenridge and West Leechburg, Pa., plants of the company. The rest went to eligible wage earners at the corporation's plants in Buffalo, Dunkirk, and Watervliet, N. Y.; Wallingford, Conn.; Ferndale, Mich.; and Los Angeles.

The company is seeking to provide a similar adjustment for employes not covered in WLB's directive of Nov. 25, 1944.

AWARDS . . .

Award of the Army-Navy "E" has been made to the following:

American Welding & Mfg. Co., Warren, O.
Ford Motor Co., Willow Run Bomber Plant, Ipsilanti, Mich.

Waldes Koh-I-Noor Inc., Long Island City, N. Y.

Ward Machine Co., Brockton, Mass.

REDUCED munitions production schedules in April were not quite met, but in most cases the misses were negligible, J. A. Krug, chairman, War Production Board, reported last week. Munitions output during the month was 1 per cent behind schedule. In no major group except combat and motor vehicles was the deficit more than 2 per cent. Actual production for the month was 4 per cent below that of March.

Military requirements began to drop off before V-E Day and the decline has accelerated since the surrender of the German forces. Current military programs, as revised through May 12, call for May munitions output 1 per cent less than for April and a gradual decline thereafter to a fourth quarter level 13 per cent below April and still lower levels in 1946.

Cutbacks have slashed some \$7 billion from the peak munitions program for 1945, to a current total of \$55 billion and corresponding cuts have been made in the 1946 program. This is a substantial drop, but it still does not bring programs down to a true one-front war basis.

The deficit in aircraft reflected a 10 per cent miss in aircraft engines. The planes themselves were above schedule, and the critical classification was withdrawn from

six engine and plane models. Except for the C-54 transport and the F4U-4 Corsair, the only items still classed as critical are jet engines and a few new planes which have not yet reached volume production.

The poor showing in combat and motor vehicles was largely the result of strikes in component plants.

Cutbacks are not spread evenly over the munitions groups. Based on the latest available figures, guns and fire control are to slide off 40 per cent from April to the end of the year, and ships 34 per cent. In contrast, dollar value of aircraft and aircraft engine production is to decline less than 1 per cent and ammunition, by the fourth quarter, would actually be running 12 per cent above the April rate, with gains in such items as rockets, bombs, naval ammunition, and mortar shells.

In the case of carbon and alloy steel, it is indicated direct military requirements will drop from more than half of total shipments last year to little more than a third of an only slightly diminished supply by the fourth quarter of this year. In copper and copper base alloy products, the cut in military requirements is slightly greater. Thus, some steel and copper as well as increased quantities of aluminum will be released.

MUNITIONS PRODUCTION—April

	(Preliminary)			% Above or Below	
	March Actual	April Actual	April Schedules	March Actual	April Schedule
Aircraft	1,315	1,224	1,249	- 7	- 2
Ships (Incl. Maintenance and Repair)	323	789	797	- 4	- 2
Guns and Fire Control	270	265	267	- 2	- 1
Ammunition and Bombs	702	695	690	- 1	+ 1
Combat and Motor Vehicles	505	450	473	-11	- 5
Communications and Electronic Equipment	333	351	348	+ 5	+ 1
Other Equipment and Supplies	1,045	1,038	1,048	- 1	- 1
TOTAL MUNITIONS	4,993	4,812	4,872	- 4	- 1

April Pig Iron Output Falls Below March Record

PIG IRON production in April totaled 4,785,659 net tons, as reported by the American Iron and Steel Institute, compared with 5,227,790 tons in March. Blast furnaces in April operated at 86.4 per cent of capacity, compared with 91.4 per cent in March. The March output was second highest in history.

April production included 73,312 tons

of ferromanganese and spiegeleisen, compared with 65,894 tons in March. Total for four months this year is 19,521,211 tons, compared with 21,082,127 tons in the comparable period in 1944. In 1943 cumulative output for four months was 20,326,130 tons. Comparisons by districts are presented in the following tabulation, in net tons:

	Pig iron	Ferro, Spiegel	Total		
			April	Year to Date	Per Cent Capacity
Eastern	875,473	34,340	909,813	3,510,600	85.1
Pittsburgh-Youngstown	1,879,430	21,951	1,901,381	7,826,089	89.2
Cleveland-Detroit	505,356	.....	505,356	1,992,502	93.2
Chicago	1,043,652	.....	1,043,652	4,213,031	90.1
Southern	245,698	17,021	262,719	1,321,468	64.8
Western	162,738	.....	162,738	657,521	69.7
Total	4,712,347	73,312	4,785,659	19,521,211	86.4

Restoration of Freedom Is Held Needed To Remove Business' Fears

Spokesman for small business points out to House committee factors contributing to future uncertainties. Cites restrictive laws and directives which hamper normal functioning of private enterprises

By WALTER SIEGERIST*

ON EVERY hand there seems to be a fear that small business is or will soon be in financial difficulties. I have examined the standing of our customers, who for the most part are all small business houses. A study with Dun & Bradstreet reveals that small business continues to have excellent ratings and is enjoying satisfactory banking connections.

Let us go back to 1932, to 1936. I started with my company in 1932. Small business was then really in a bad way financially and getting worse. Some could get RFC loans, a very few had bank credits, but many were told, as I was, by the bank that we owed so much already and since the mortgage bonds were in default, it would be necessary for me to liquidate the business unless I could operate it without capital. We did operate without capital during 1933 and 1934. Matters were finally cleared up so the banks would again lend us money and the bonds were paid off with earnings. I helped several other small businesses similarly situated in this city to survive even though they had been without credit standing for three years or more.

Freedom Sustained Business in Thirties

Why then do we fear for the future today when we all have going concerns with cash balances, and the best civilian customers in the world waiting for our goods? The answer is that in the thirties, management had its freedom. We could plan, price, purchase, and sell in a free market. We bargained collectively and directly with our own employees. Our bank connections knew that our cash flow sheet of material, labor, inventory, administrative, tax, and other costs could be relied upon because no government bureau had the power to upset us. That is why the small business man survived the early dark thirties. He had freedom to use his knowledge, courage, and initiative.

Today we do not have freedom because our economy is necessarily planned to fit our war needs. This is as it should

*This is an abstract of a statement presented at a public hearing in St. Louis of a sub-committee of the House Select Committee to Investigate and Study Small Business. The author is president of the Associated Industries of Missouri, and is president and treasurer of The Medart Co., St. Louis.

be. But what about small business' freedom sixty days after V-E Day? What about it sixty days after Pacific victory? We fear from what we hear that we will not have freedom returned to us so we worry. The statements from some parts of government that the regulations and restrictions now imposed are needed for economic planning for the greatest good for the whole people is most fearsome of all. We know that planning by government cannot be done without dictation of the kind our soldiers are fighting against on European and Asiatic battlefields.

I wish to mention some of the laws and directives that hurt our financial

standing and cause our bankers to be concerned whether or not we are a good risk after V-E Day.

1. Taxation. All prudent business that is inclined to build up a reserve for reconversion can do very little because of the confiscatory excess profits taxes. These lead to many other indirect detrimental results or practices. It is a very inconsistent tax situation which makes the net cost of my \$1 luncheon, when paid by my company actually cost the company 20 cents, but for which I am required to earn \$1.50 to be able to pay for it because my government wants one-third of what I am paid by my company.

Excessive taxes on profits are in reality indirect sales taxes paid by the customers of the efficient producers.

Small and large business must do forward planning. This requires assurance from Congress that tax and similar business legislation will fall within a consistent pattern that may be depended upon. Tax laws must no longer be written by the squeal test method.

2. Prices. Small business knows that



STUDY ARMOR ROLLING: Steel company engineers and Ordnance representatives are shown above at Aberdeen Proving Ground, Md., where they met recently to discuss problems relating to rolled armor. Front row, left to right: C. Chase, Republic Steel Corp.; C. L. Altenburger, Great Lakes Steel Corp.; H. V. Joyce of Carnegie-Illinois Steel Corp.; W. P. Getty, Jones & Laughlin Steel Corp.; N. E. Rothenthaler, Ford Motor Co.; Robert Sibley, Henry Disston & Sons; Harry Dittmar, Republic Steel Corp. Second row: Lieut. Col. N. A. Matthews, Watertown Arsenal; H. J. Rouse, Aberdeen Proving Ground; Maj. D. C. Pippel, Office of Chief of Ordnance; Dr. C. H. Lorig, Battelle Memorial Institute; J. E. Shoemaker, Standard Steel Spring Co.; Maj. C. J. Yaeger, Aberdeen Proving Ground. Third row: I. W. Teichman, G. H. Oshry, Dr. E. L. Reed, Capt. E. R. Beyer, Lieut. A. P. Stergion and Lieut. F. S. Wolff, all from Aberdeen, except Dr. Reed, who represented Watertown Arsenal

- the customers pay the expenses of the business. Furthermore, we realize that the other fellow's employees as well as our own are our customers. However, we cannot stay in business on the principle of OPA, that no business house may adjust prices of the loss items to cover costs as long as the company's business as a whole shows a profit. The OPA in any form would eventually be the death of small business. It is based on the premise that a government agency has better judgment than management regarding the item of cost entering into the products of business. Government lives off the profit of all private enterprise. Therefore, it behooves government to let private enterprise make a profit in order that government itself may live. The alternative is planned economy or Naziism with its slave labor.
3. Labor. Small industry employs the greater portion of the 25 per cent of the 60 million employed in industry. We want labor to enjoy the highest standard of living. It is American and good business. We however, ask that the employer shall have equal rights with labor and that the right of trial by jury shall be restored to the employer. There is nothing incongruous in the relationship of master and servant or employer and employed. It must be maintained in order to preserve our United States.
 4. Tax Collection. A small business wants and must have pleasant relations with its employes. Anything tending against this should be eliminated. We are now the government's income tax collector. This is an added expense to business and an irritation to the employe that is blamed on the employer. The government should be its own tax collector.
 5. Renegotiation. King George and his parliament "in their opinion" felt the American colonies should be taxed. We did not have the same opinion so we are the United States. In the year 1942, Congress passed the Renegotiation act which states, "If in the opinion" of certain secretaries and bureaus, a small business has made too much profit when selling its regular product at OPA prices or lower to these agencies and bureaus, then the business shall be penalized by forfeiting whatever portion of the profit the individual or bureau's opinion calls for. If no profit is made there is no renegotiation regardless of how high the price. This is the first time in the history of the United States that business efficiency is penalized and a profit deriving from good management and ingenious processing becomes a crime. The administration of this act permits bureau administrators to determine what in their opinion is a fair profit before taxes. Since there is no law or rule defining a fair percentage of profit, the Renegotiation bureaus make one determination one day, another the next in accordance with their personal feelings. Small business confidence will be hurt if there is an extension of this law.
 6. Government Reports. The numerous and in some instances duplication of reports is an onerous, expensive burden on small business. In our business, one-third of the executive's time goes to government reports. This is a burden that cannot and certainly will not be borne by our peacetime customers. Take one example, our small business never paid more than \$750 for a year-end audit before the war period. The 1944 costs for the audit plus federal and state income tax, report on pension operation, Budget Form 49-R-173, and standard form of contractor's report for renegotiation for 1944 made by the same auditing firm cost \$1890, two and one-half times prewar cost. This is only one item demonstrating the high cost of government in our business.
 7. Government Spending. The small business man has shown his patriotism by the wonderful job he has done. We all know war is terribly destructive. The objectives must be reached at any cost. However, we also have all spent our business lives in making the customer's dollar cover all items of expense or cost with a little left over for stockholders and for setting aside for the rainy day that always comes. We ask your committee and all of Congress to cut down government spending to the absolute minimum at the earliest moment consistent with victory.
 8. Conclusion. I was an employe in many places for many more years than I have been an employer in a small business. It is my conviction that both management and labor and the country as a whole will remain free only so long as all elements of our economy remain free. It is for this reason that I say, for the sake of the freedom of the people, government must:
 - A. Give freedom back to large and small business.
 - B. Get out of all business itself as quickly as victory is proclaimed.
 - C. Stick strictly to its business of governing.
 - D. Test each large or small expenditure exactly as the small businessman must test it. If it cannot be afforded, or it will not pay, or is contrary to ethical standards, or spoils the customers, it just is not a good expenditure.
 - E. Be guided by the truth that in this world no person, people or nation can for very long get anything unless it is earned.

TRANSITION TOPICS

RECONVERSION—Scarcity of materials large obstacle in path of resumption of peacetime goods production, but volume within year expected to exceed 1939 level by 30 per cent. See page 75.

WESTERN STEEL—Westerners making plans for reconversion of Kaiser's Fontana, Calif., plant to peacetime basis. See page 78.

SMALL BUSINESS—Restoration of freedom held essential to remove business' fears. Spokesman contends restrictions and directives are hampering normal function of private enterprises. See page 82.

PER-TERMINATION AGREEMENTS—War and Navy Departments seek to negotiate settlement agreements with 19 companies representing 90 per cent of steelmaking capacity. See page 85.

CARTELS—State Department proposes international agreement to prohibit participation in international agreements which restrain trade, restrict access to world markets, and foster monopolistic control. See page 88.

AUTOMOBILES—Outlook for early release of materials for passenger cars gloomy. Schedule calls for production of 2,000,000 units in year ending July 1, 1946. See page 91.

LIGHT METALS—Disposal of light metals manufacturing facilities in the West will be explored at conference in Seattle June 21-22. See page 97.

Berge Says Trade Groups Help Preserve Individual Enterprise

Assistant attorney general points out that association activities in promoting efficiency in production and distribution, and other functions, are more essential now than formerly. Must make competitive system function

TRADE associations can do much to preserve individual enterprise in business and thereby assure people a more abundant life than is possible under any other type of economic organization, Wendell Berge, assistant attorney general, declared in an address before the Washington Trade Association Executives recently.

Discussing "Trade Associations and the Antitrust Laws," Mr. Berge pointed out that trade association activities directed toward development of efficiency in production and distribution through technical research, the development of new products and new uses for old products, elimination of product misrepresentation, and supplying industry information to the government, as well as representation of industry interests in dealing with government, labor and consumer groups are more essential now than formerly.

"The important thing is the fundamental attitude of trade associations toward our competitive system," he declared. "If trade association members and their executives have an intelligent awareness of what is going on today in American economic life, they will be able to see

their own activities with reference to the economic picture as a whole. They can then chart their courses accordingly. Such awareness, in my opinion, is bound to influence trade association action toward policies that will preserve rather than destroy our competitive system.

"If policies of this kind are adopted and pursued, I am sure that you will find yourselves treading in the same general direction as your government and that, indeed, law enforcement activity and trade association activity will proceed side by side.

"We in this country are becoming increasingly mindful of the need to make our competitive system function effectively. We are more than ever aware of the necessity of keeping the doors of opportunity open for individual effort," Mr. Berge said.

He called attention to "the fundamental change that has occurred during the last generation in the practical nature of the problem of monopolies and restraints of trade. Formerly, we were most concerned with corporate mergers which gave to a single corporation, or two or three large corporations, the virtual control of an industry. The prin-

cipal problem today is that of keeping business organizations which are technically separate and ostensibly competitive from getting together through one subtle device or another to effectually eliminate real competition between them.

"In determining future trends," Mr. Berge predicted, "the activities of businessmen in trade associations will play no small part. Trade associations, if properly utilized, can be an important factor in weeding out unfair competitive practices, and in introducing and promoting policies which make industry more efficient and secure a wider and more economical distribution of goods for the benefit of consumers. Trade associations, if intelligently directed by men of vision, can be instruments for expanding trade and commerce rather than restricting it. But whether these associations shall in the long run contribute to the ultimate salvation of our business life or to its destruction depends, I believe, to a large degree upon their fundamental attitude: Are they seeking to expand production and distribution at lower costs so that an ever increasing body of consumers can purchase a greater volume of goods at lower prices; or are they seeking to restrict production, regiment distribution, raise prices and corner the profits for that little group that is fortunate enough to belong to the club?"

Hurley Explains Surplus Property Board's Plans

The chain of thinking which led the Surplus Property Board to adopt two "key" regulations, shortly to be an-



LEWIS B. SCHWELLENBACH



TOM C. CLARK



CLINTON P. ANDERSON

In the first major reorganization of his administration, President Truman has appointed these three men to important cabinet posts. New secretary of labor will be Lewis B. Schwellenbach (Dem., Wash.), a former senator and more recently a federal district judge. He succeeds

Frances Perkins who held the office through Mr. Roosevelt's tenure. Tom C. Clark (Dem., Tex.), who will succeed Francis Biddle as attorney general, has been an assistant attorney general since 1937. Rep. Clinton P. Anderson (Dem., New Mex.) has been named secretary of agriculture.

Pre-termination Agreements To Be Sought With Steel Producers

War and Navy Departments launch campaign to negotiate settlement agreements with 19 companies representing 90 per cent of steelmaking capacity of nation. Move part of general plan

THE WAR and Navy Departments have launched a campaign to negotiate pre-termination settlement agreements with 19 leading integrated steel companies.

The War Department has the responsibility for 14 companies. The Ordnance Department will handle the American Rolling Mill Co., Carpenter Steel Co., Inland Steel Co., Jones & Laughlin Steel Corp., Pittsburgh Steel Co., Republic Steel Corp., Sharon Steel Corp., National Steel Corp. The Corps of Engineers will handle Allegheny Ludlum Steel Corp., Colorado Fuel & Iron Corp., Wickwire Spencer Steel Co., Youngstown Sheet & Tube Co., Wheeling Steel Corp. and Copperweld Steel Co.

The Navy Department has the responsibility for the five companies. Bureau of Ordnance will handle Bethlehem Steel Co. and Crucible Steel Co. of America, while the Bureau of Ships will handle Alan Wood Steel Co., Lukens Steel Co., United States Steel Corp., and subsidiaries.

Represent 90 Per Cent of Capacity

These companies represent approximately 90 per cent of the steel business in the United States and, if they were to enter into some pre-termination agreements with the War and Navy Departments it would facilitate rapid settlement of terminated war contracts.

Pre-termination planning is simply agreeing before termination to a solution of some of the problems to be met at the time of termination rather than after. It speeds up settlements and clears plants more rapidly for new war or civilian production. The effort to plan in advance with the steel companies is only a part of a general campaign to plan in advance with as many contractors as possible for the handling of problems arising after termination.

The War and Navy Departments are organizing termination teams. The objectives of the program are to negotiate and draft pre-termination settlement agreements with the steel companies, specifying the method of arriving at various compensation and termination claims.

The agreements may contain: (1) An agreement upon the retention values of inventories to be retained by the contractors with a fixed price or by a definite formula for computation of such price.

(2) A method of pricing inventories

containing products covered by OPA schedule No. 6 on the basis of established selling prices or adjustment to established prices.

(3) An agreed method of costing claims for products not covered by the OPA schedule.

(4) Agreed method of disposal of inventories which the contractor does not wish to retain.

(5) An agreement as to what items are to be scrapped.

(6) Agreed methods of counting and verifying the inventory and checking the accuracy of the claim to be filed with the contractor's customers.

Certain members of the steel industry requested authority to submit termination claims on the basis of established sales prices. The Navy Department Committee agreed the established selling prices together with any adjustments will establish a convenient method of settlement provided the government assured itself on the basis of evidence submitted by the company that their use would not result in granting more than fair compensation to the contractor. The War Department concurred in this.

Any agreement negotiated will be applicable to both prime and subcontractors of a company. Agreements can cover existing as well as future contracts for the classes of products covered by the agreements. With proper notice, either may withdraw from the agreement regarding future terminations.

FTC Pushes for Decision In Pittsburgh Plus Case

Further developments in the Federal Trade Commission's attempt to enforce its order that the United States Steel Corp. and its subsidiaries cease and desist from the practice of quoting steel products on the basis of Pittsburgh plus the freight rate to destination hinge on the decision of the United States Circuit Court of Appeals, Third Circuit, Philadelphia, on the validity of the Steel corporation's contention that the FTC order should be dismissed on the ground that conditions governing the sale of steel products have changed materially since the order originally was brought. In recent hearings Federal Trade Commission attorneys argued that any such changes are irrelevant insofar as the issues in this case are concerned, and that the case should proceed to a decision.

nounced and put into effect, was outlined by Robert A. Hurley, board member and former governor of Connecticut, in a recent address before the executive committee of the Connecticut Manufacturers' Association, at New Haven.

One of these regulations will permit the owning agencies to sell surplus machine tools and allied equipment to war contractors in possession of them. The other will permit the sale of raw materials in short supply to manufacturers who need them for production of civilian goods.

"It has been impressed upon the board that certain segments of manufacturing enterprise, whose war contracts were in process of termination, wish to know now whether or not they can acquire government tools in their plants and, if so, under what terms and conditions. The board is aware that a speedy answer to this question was imperative if these plants were to get into civilian production rapidly," said Governor Hurley.

"In considering the question, the board was faced with important alternative courses of action. Whether to allow sales to contractors in possession at this time, before actual war contract cutbacks and terminations; or whether to withhold government owned tools until they have become no longer needed in war production in order to allow simultaneous access to them by all prospective buyers.

"We were aware that the imminence of the reconversion of certain war industries to peacetime production demands a clear statement of government policy in this matter. The speed with which industry is able to make the changeover depends in large part on the ability of industry to plan that changeover and the acquisition of government tools is a part, an important part, of reconversion planning. At the same time we had to consider whether or not there will be enough tools ultimately to satisfy all possible consumers.

Withholding Would Be Unwise

"We carefully canvassed the supply and the probable postwar demand for tools and, on the basis of that canvass, we have determined that there would be enough tools for all, and that to withhold tools from contractors in possession would not only be quixotic, but would work a very definite harm on industry and prevent it from getting into peacetime production at the earliest possible moment."

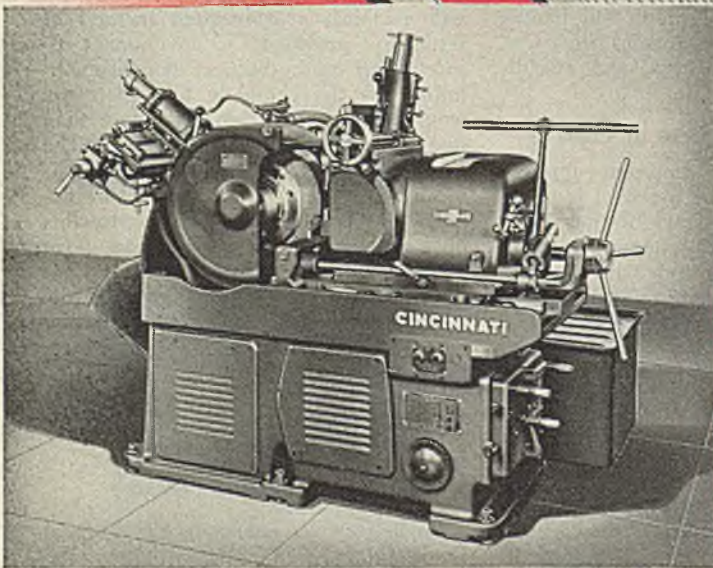
Such sales are to be carried out under uniform terms and conditions laid down by the board, said Governor Hurley, and without the necessity of waiting until the tools involved formally have been declared to be surplus.

The second of the two new regulations about to be issued, said Governor Hurley, is designed to speed up the sale of contractor inventory, so that raw materials, components and work in progress which are in short supply can be utilized by manufacturers to get into civilian production.



MEMORANDUM

Check this!
Family of
Four Parts
Ground on a
Cincinnati Centerless
in one Set-up

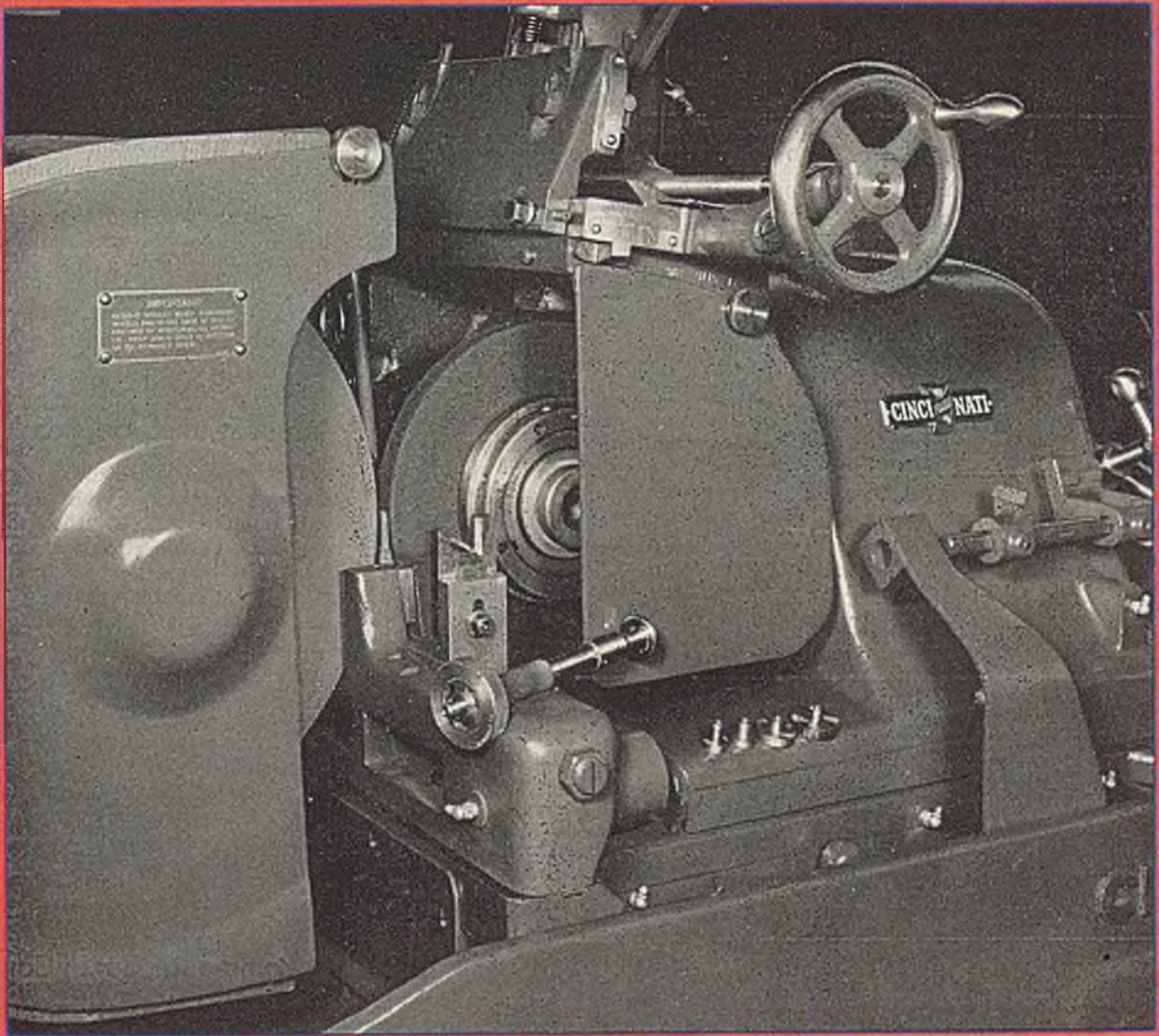


Illustrated at the left is the CINCINNATI No. 2 Centerless Grinder. Catalog G-456-3 contains complete specifications. Sweet's Catalog File for Mechanical Industries gives a brief description of CINCINNATI Centerless and Centertype Grinding Machines.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★
Keep on buying
WAR BONDS
★ ★ ★ ★ ★ ★ ★ ★ ★ ★

CINCINNATI

CENTER TYPE GRINDING MACHINES



● On this job, the pilot diameter and face of *four different* sizes of flanged buttons are ground on a CINCINNATI No. 2 Centerless *from the one setup* illustrated above. A special loading mandrel, supported between wheels by vee blocks, has interchangeable details for handling the various sizes. With this arrangement, 150 pieces are ground per hour, diameter and face at the same time. The setup is another example of Cincinnati Application Engineering, and shows how easily CINCINNATI Centerless

Grinders may be tooled up for a family of parts. These machines are built in three standard sizes (and larger and smaller than standard, too) for handling a wide range of cylindrical and spherical parts in virtually all types of metal and metal substitutes. Why not talk over your grinding operations with our engineers? They will be glad to give you the benefit of more than a score of years' experience in the application of the centerless method to difficult and unusual grinding jobs.

GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES

State Department Hopes to Banish Restrictive Practices of Cartels

Department proposes international agreement prohibiting participation of commercial enterprises in contracts which restrain international trade, restrict access to world markets, or foster monopolistic control in international trade

STATE DEPARTMENT believes control of international trade by private cartels is a dangerous thing and is inconsistent with the economic philosophy which best serves the cause of peace and human well-being, William L. Clayton, assistant secretary of state, has informed the Senate Special Committee Investigating Petroleum Resources.

"We plan to propose to the nations of the world an international agreement to banish restrictive practices of international cartels," he said. "At this moment no one can say whether we shall be successful."

In the meantime, he said, it would be unwise to ease up on our antitrust laws. It is true that the application of the antitrust laws in foreign trade is quite uncertain, said Mr. Clayton. "The principal reason, of course, is that international business agreements and Webb-Pomerene activities, long unchallenged by enforcement authorities, are now subject to active investigation and prosecution by both the Department of Justice and the Federal Trade Commission. It will clearly require several years of active adjudication before the law regarding foreign trade practices is as well established as the law regarding domestic trade practice."

The alternative, he said, would be endowment of an administrative agency with an unusually large measure of discretion in determining reasonable standards of restraint in foreign trade; he doubted the ability of Congress to clothe such a law in sufficiently precise language, and he doubted the willingness of Congress to give such a measure of power to an agency.

The plan for international regulation which the State Department favors is an agreement among the various countries prohibiting participation of commercial enterprises "in contracts and combinations which restrain international trade, restrict access to international markets, or foster monopolistic control in international trade. We are under no illusions as regards the difficulties of obtaining general assent to such a program . . . but there are signs from abroad of a growing popular realization that such international business practices as price fixing, division of markets, limitation of production, and suppression of technology, have no place in an international effort to expand the trade of the world and to increase productivity and well-being. The information about the ac-

tivities of international cartels which has been brought to light in this country has played a large part in increasing understanding of the problem the world over.

"It is not proposed to establish an international agency to enforce such an agreement on cartels. Rather, each government would enforce the provisions of the agreement within its own sphere of jurisdiction. Each government might agree to provide for mandatory filing with a suitable government agency of appropriate information relating to contracts and relationships affecting foreign trade The suggested program would recommend the establishment of an International Office for Business Practices, tied into the United Nations organization through the Economic and Social Council, to facilitate intergovernmental co-operation in the cartel field."

Unless such an international agreement to control foreign trade materializes, said Mr. Clayton, one cartel may lead to others because of their effect on trade and exchange.

"For example," he said, "Bolivia depends to a considerable extent upon tin exports for foreign exchange and public revenue. The maintenance of the tin cartel is therefore a matter of national interest to Bolivians. On the other hand, cartels in the chemical and other industries aggravate Bolivia's balance of trade difficulties by maintaining high prices upon imported commodities and by preventing so far as possible the development of manufacture in Latin America. Since various countries will probably be in urgent need of foreign exchange after the war, it is reasonable to expect that unless more constructive methods of cartel control are adopted, there will be pressure from some governments for cartelization of their principal exports, and that such pressure will be more vigorous when imports into such countries are also cartelized."

Murray and Scrugham Seek Metal Premium Legislation

Sen. James E. Murray, chairman, Senate Small Business Committee, and Sen. James G. Scrugham, chairman, Mining and Minerals Industry Subcommittee, co-introducers of S. 502, a bill which carries authorization for continuance of premiums to copper, lead and zinc mines hold that the legislation must contain the non-cancellable feature when it finally

becomes law, it was revealed last week.

Under the bill as passed by the Senate, premiums would be guaranteed until June 30, 1945, on copper, lead and zinc mined for the war effort. However, the House Banking and Currency Committee has eliminated the noncancellable feature of the measure. Interested executive agencies of the government have indicated they would prefer to be in position to cancel the premiums when, in their opinions, it is no longer necessary to stimulate the production of these three important metals.

Krug Cites Need for Large Increase in Lead Production

Unless lead production is increased substantially, lack of this critical metal will interfere directly with the prosecution of the war against Japan and the fulfillment of the demands of important war-supporting activities, J. A. Krug, chairman of the War Production Board, and Paul V. McNutt, chairman of the War Manpower Commission, said recently. Mr. Krug urged that war workers released from shipyards, airplane factories, and other war plants after military cutbacks, take employment in lead mines. Lead mines are in a position to increase the output of this metal, he said, if a few thousand workers could be added to the present number of men employed.

Recommends Cut in Contract For Canadian Aluminum

War Production Board has recommended to the Metals Reserve Co. that the amount of aluminum to be purchased from Aluminum Co. of Canada's Quebec plants be reduced from 250 million pounds to 100 million pounds during 1945. The purchase contract, including a cancellation clause, was dated March 28, 1945.

Truck Industry Says It Can Meet Increased Program

The truck industry will be able to meet the demands of the additional 1945 program, representatives of the industry have informed the War Production Board. The additional program calls for 188,700 trucks in the second half of 1945 and consists of 85,000 light trucks, 95,000 medium, 5000 light-heavy, 3000 heavy-heavy, and 700 off-highway trucks.

Appointment

William S. Bradley of Dallas, Tex., has been appointed assistant to the secretary, Department of Commerce, in charge of surplus property.

PRIORITIES-ALLOCATIONS-PRICES

Summaries of revocations of and amendments to orders and regulations; official interpretations and directives, issued by War Production Board and Office of Price Administration

REVOCATIONS

The following orders have been revoked by WPB:

ELECTRIC DISCHARGE LAMPS: Order L-28-a which specified types and voltages of incandescent, fluorescent and glow-discharge lamps that could be produced. Restrictions contained in direction 1 of the order, prohibiting extension of preference ratings from lamps in one classified group to those in other groups, to replenish inventories, are retained in direction 13 to priorities regulation 3. (L-28-a)

BICYCLES: Order L-52 which restricted production of bicycles. (L-52)

LOCOMOTIVE PARTS: Order L-97-d which provided for the scheduling of critical locomotive component parts. (L-97-d)

HEATING EQUIPMENT: Order L-107 which restricted delivery of light-weight extended-surface heating equipment. (L-107)

FLATWARE AND HOLLOW WARE: Order L-140-b which controlled production and distribution of table flatware and hollow ware. (L-140-b)

WATER HEATERS: Order L-185 which controlled production of water heaters. (L-185)

MOLYBDENUM: Order M-110 which required reports on monthly sales of over 2000 pounds of molybdenum. The molybdenum reports will continue to be required under order M-21. (M-110)

AMENDMENTS

CLASS B PRODUCTS: A manufacturer now may exceed an authorized production schedule for a class B product in a case where he has obtained the material for another purpose and it can no longer be used for that purpose. The amended CMP regulation No. 1 continues the provision for filling a deficiency in a production schedule to the extent that a deficiency not exceeding 10 per cent in an authorized production schedule for a class B product during the first quarter of 1945 may be made up in the second calendar quarter of 1945. The regulation also provides that an order for aluminum bearing an AM number from AM-0001 through AM-9599, be treated as an authorized controlled material order. (CMP No. 1)

WAREHOUSE SALES: Amount of copper wire mill products for which a warehouse may enter warehouse stock replacement orders in any month has been increased from 25 per cent to 33 1/3 per cent of deliveries made from stock during the second quarter of 1944. Warehouses may enter also until July 1 deferred warehouse stock orders provided the total amount so ordered in any month does not exceed 33 1/3 per cent of deliveries made from stock during the second quarter of 1944, as reported to WPB on form WPB-3009. A warehouse is permitted, but is not required, to accept a "replacement" order from another warehouse, but if accepted the order must be treated as an authorized controlled material order. (CMP No. 4)

MRO SUPPLIES: Use of CMP regulation No. 5 ratings and symbols may be used to obtain maintenance, repair and operating supplies and fixtures, dies and fixtures for reconversion to civilian production, in advance of actual production, by a person who proposes to start manufacturing a product he is not now making. In addition, WPB has uprated the residual rating for in-

stallation materials from AA-5 to AA-3. (CMP No. 5)

REPAIR PARTS: Use by repairmen of the preference rating of AA-3 assigned by CMP regulation No. 9-A is prohibited for the purchase of internal combustion engines (except air-cooled engines).

Revocation of direction 4 to CMP regulation No. 9-A now permits a repairman to use the V-3 allotment symbol to obtain copper pipe and tubing and copper-base-alloy pipe and tubing without the former restriction to certain sizes and types. (CMP No. 9-A)

MACHINE TOOLS: All special controls over the production and distribution of machine tools having a retail sales price of less than \$1000 have been removed by amendment of order E-1-b. (E-1-b)

PLUMBING AND HEATING FITTINGS: Restrictions on the use of copper and copper base alloy in the manufacture, assembly and finishing of plumbing fixture fittings and trim have been removed by the revocation of schedule V to the plumbing and heating simplification order. (L-42)

AUTOMOTIVE REPLACEMENT PARTS: All restrictions on production and distribution of automotive replacement parts have been removed through a revision of order L-158. A preference rating of AA-1 is assigned under the revised order to producers of replacement parts and to the manufacturers of the components of such parts listed on schedules I and II, except parts and components for light trucks and passenger automobiles, for which a preference rating of AA-2X is assigned. (L-158)

COMMERCIAL DISHWASHERS: Controls limiting the volume of production of commercial dishwashers and restricting manufacture to specified types have been removed from order L-248. Restrictions on delivery of these items remain substantially unchanged. (L-248)

INDUSTRIAL TYPE INSTRUMENTS: Schedule 7 of order L-272 that restricted the production of industrial thermometers to specified finishes, sizes, types, models and markings has been revoked. Thermometer production will remain subject to provisions of order M-293 and other applicable orders. (L-272)

WOODWORKING MACHINERY: Preference ratings for class 2 woodworking machinery (that which had a producer's list price of \$350 or less on Oct. 15, 1942) are no longer required. (L-311)

TOOL STEEL: The date after which purchasers of high-speed tool steel must accept the greater proportion of their requirements in low-percentage tungsten steel has been postponed from June 1 to June 30, 1945. Purchasers must accept 85 per cent of their high-speed tool requirements in class A tool steel, containing not more than 6.75 per cent tungsten, and only 15 per cent in class B, containing more than 12 per cent tungsten. Deliveries of class B high-speed steel, containing cobalt for use in the manufacture of tool holder bits are now exempted from provisions of the order. Counterweight parts for aircraft engines are not considered tool steel under the amended order. (M-21-j)

SILVER: All controls on the use of domestic silver have been lifted by an amendment to order M-199. Restrictions on the use of foreign silver continue in effect. (M-199)

OSMIUM: Consumers of osmium metal now may use in any quarter up to 12 1/2 per cent of the amount they used in the year 1941, without restrictions as to when the osmium was

alloyed. New users of the metal are allowed to use up to two ounces per quarter. (M-302)

INSTRUCTIONS

DOMESTIC STOVES: Rated orders for fuel-oil table stoves for export to countries other than Canada and United States territories or possessions are to be treated as unrated orders if the rating was applied or extended on or before May 26, 1945. (L-23-o)

STEEL BOILERS: Restrictions on the manufacture of low-pressure steel boilers intended for stock have been removed through an amendment to direction 1 to table 14 of the scheduling order. (M-293)

ELECTRONIC EQUIPMENT: No manufacturer may produce electronic equipment under priorities regulation 27 except to fill preferred orders, to fill authorized production schedules and programs as defined in CMP regulation 1 or fill schedules or programs authorized on a spot basis. PR 27 does not establish any authorized production schedule or authorized program for electronic equipment, nor can the AA-4 rating assigned by the regulation be used to purchase complete equipment, such as radios, since these are not production materials. Priorities assistance granted by PR 27 may not be used to accumulate reservoirs of component parts in anticipation of the resumption of civilian radio production. (PR No. 27)

LEAD CHEMICALS: Order M-384, governing use of lead chemicals, prohibits the use of lead for art pottery and decorative ceramics. However, appeals by producers of art pottery and decorative ceramics for the use of lead or lead chemicals held in the inventories of these producers as of March 27, 1945, will be considered by WPB. Such appeals should be filed in accordance with provisions of the order. (M-384)

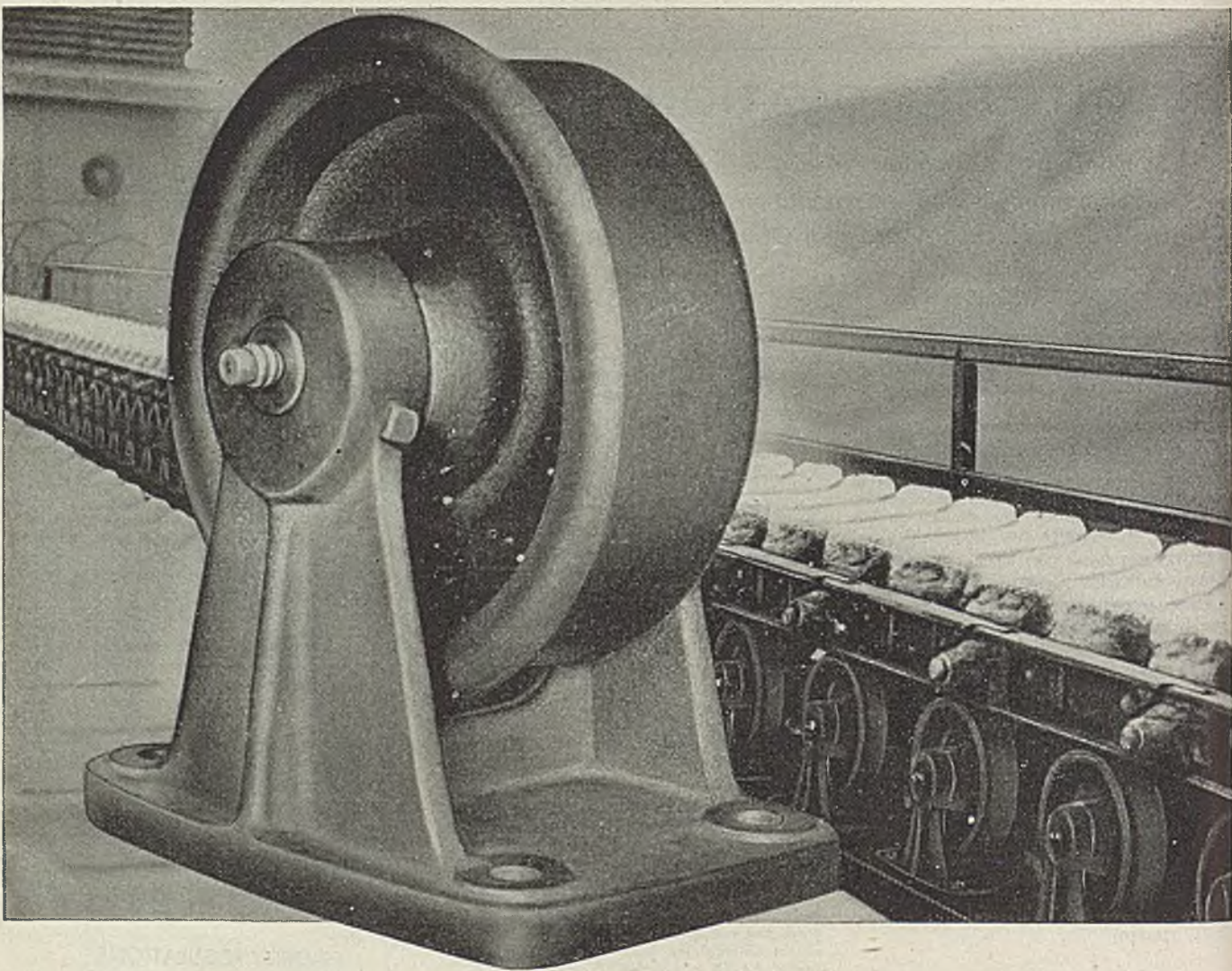
PRIORITY REGULATIONS

MRO SUPPLIES: The following items may no longer be obtained under blanket maintenance, repair and operating supplies ratings: Metal strapping; electric irons; domestic electric ranges; domestic and commercial electric fans; chronometers, chronographs and electric timers, excluding interval timers; compressors, reciprocating type for compressing air, in any size smaller than 10 horsepower, of the tank mounted design sometimes referred to as the service station type of compressors. These items have been added to list B of priorities regulation No. 3. If a rating is needed to obtain any list B product, application must be made on form WPB-541, or other form designated for that particular item or for use by particular persons. (PR-3)

PRICE REGULATIONS

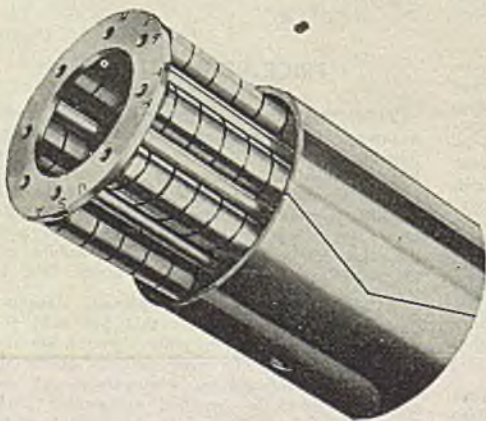
ZINC SCRAP: A maximum price of 4.95c a pound, f.o.b. shipping point, for zinc base forming and stamping dies sold as scrap has been established. A quantity premium of 1/2-cent a pound is permitted on shipments of 20,000 pounds or more of the new grade either separately or in combination with new die cast scrap, old and new automobile radiator grilles, and old die cast scrap. (No. 3)

AUTOMOTIVE PARTS: Specially designed parts for military vehicles that are sold for civilian use have been placed under specific price regulation. The new ceilings cover all sales by manufacturers, wholesalers and retailers of specially designed automotive parts for military vehicles. A parts manufacturer who was in the business before January, 1941, will base his price on the highest price he charged in the six-month period ending March 31, 1942, or, where he did not make a charge, on a price quoted twice during that period. (No. 453)



Long-Lived Stationary Wheel Pig Casting Machine...

BEARINGS: HYATT



The William M. Bailey Company's Stationary Wheel Pig Casting Machine has proved its merit as a result of specialized design which enables it to operate efficiently over a long lifetime under severe operating conditions.

Contributing enormously to the elimination of vibration in the machine and for freedom from high maintenance costs—Hyatt Roller Bearings are used to keep the wheels in accurate alignment and free-turning with minimum of attention.

Hyatt engineers will gladly consult with your designers on the proper application of Hyatt Roller Bearings to increase production and assure steady performance.

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION

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MIRRORS of MOTORDOM

Outlook for early release of materials for automobile production dark. Automotive releases on parts and equipment going forth to suppliers, but deliveries are uncertain. Interlocking agency controls may hamper reconversion

DETROIT

IF ANY manufacturer of parts or sub-assemblies usable in passenger cars, whether he ever dealt with the automotive industry before or not, can see some open capacity in his plant over the next few months and can discern even a faint glimmer of a possibility of obtaining necessary materials without priority assistance, he had best take the next train or airplane to Detroit and start making the rounds of purchasing departments of the motor plants here. He will be welcomed with open arms—at least, right now, when the materials picture looks particularly black.

So far as the WPB is concerned, it has snapped on the green light for passenger car production after July 1, but as one industry observer said when informed of the news, "What, again?" Between now and July, the agency's L and M orders probably will be falling like leaves in the autumn breeze, as well they should. If it were only as simple as stamping the word "void" on a few sheafs of regulations, the outlook would be rosy. Unfortunately, paper work is the least part of the car manufacturing program now being mapped.

Little "Free" Steel Likely

It is stated no priority assistance can be provided on materials, beyond the opening of CMP on July 1. How much this will mean is not clear, since third-quarter allocations of steel, for example, under the CMP ticket system are said to call for the entire tonnage likely to be rolled, leaving comparatively little to be scrambled for in the "free" market. The steel producers, as well as a good many parts suppliers, do not entirely subscribe to this gloomy outlook painted by the WPB; in fact that is one reason why the WPB relaxed its controls, because it was assured by the auto industry their buyers would take chances on obtaining parts and materials if given free rein. Beyond the question of basic raw materials, however, are many complexities as yet unanswered—the single matter of plating, for example, and where to get the necessary cadmium, zinc, copper, nickel and chromium.

Automotive releases are definitely in suppliers' hands—telegraphic instructions to proceed with production on orders placed months earlier and in conformity with shipping schedules carried on these orders. When asked about this, Henry P. Nelson, WPB automotive reconversion director, said he had seen such telegrams but did not believe they were actual releases, but just an "alerting" of suppliers. Few recipients of the wires would agree with him.

No great enthusiasm greeted the WPB's O.K. of 214,678 passenger cars over the balance of this year. The quota, amounting to about 5 per cent of a normal year's production, is felt generally to be far too small, both from the standpoint of maximum employment of labor and of permitting operations in the black. Looking ahead, WPB experts see the possibility of the industry making 400,000 cars in the first quarter of 1946, and 1,400,000 in the second quarter, to make a total of something over 2,000,000 for the first year of authorized production. WPB has said it will assign individual production quotas to each manufacturer, with the smaller producers' allotments adjusted upward, and provisions made for the possibility of new producers entering the automotive field.

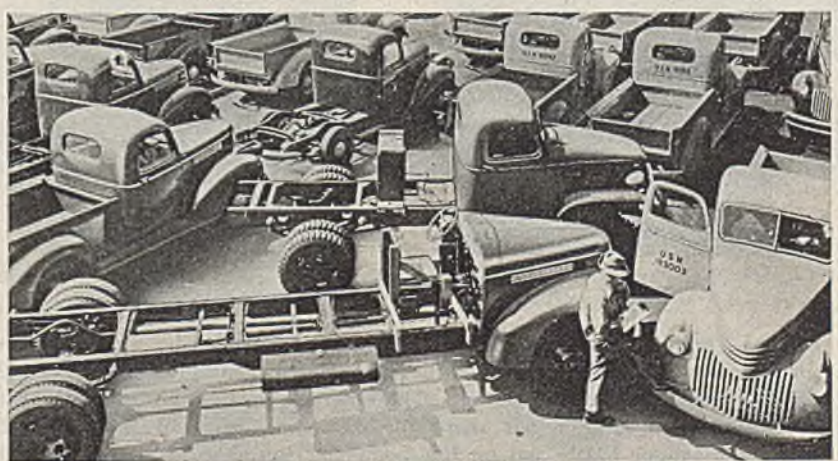
Actually, the WPB would like to wash its hands of the entire matter of controls over production, but it is fearful of chaotic conditions envisioned as the possible result. Furthermore, WPB controls are interlocked with those of other agencies, such as the WMC, Selective Service, Surplus Property Board and the military procurement services, and if the WPB should make a clean break, it might place the other agencies in an embarrassing position.

But if reconversion is to get anywhere at all without tiresome delays, these other agencies must act in concert. Thus, there has been no realistic cancellation and termination of war contracts by the military services following the defeat of Germany. A few dribs here and a few drabs

there, but nothing commensurate with the apparent decrease in requirements. Even the recently announced cutbacks in aircraft production, described as monumental, amount to only 17,000 planes over the next 18 months, or less than 1000 per month, and aircraft are being produced in excess of 5000 per month. After World War I, aircraft orders were cut to the bone within three days. Granted an extensive Pacific campaign still remains ahead, many think the aircraft program could have been cut back 70 per cent immediately after V-E Day, or perhaps even sooner, and more than ample production would have continued to supply Pacific requirements. Considerable mystery surrounds the slowness of contract reductions in all types of military equipment. Clear this up, and the materials problems for reconverting civilian industries would vanish.

The auto industry urges the immediate elimination of all controls of the War Manpower Commission as a first and major step in clearing up principal materials shortages which in many cases exist because of maldistribution of manpower. Remedy is an unrestricted flow of workers to industries where jobs are waiting.

Also, general order 5-10 issued by Mr. Byrnes of the Office of War Mobilization and Reconversion early this year, and requiring any civilian goods producer desiring to exceed the production level of the fourth quarter of 1944 to obtain WMC approval before so doing, is ridiculous now when the goal must be to try to exceed the 1944 level of production in order to provide more employment in civilian goods manufacture. Furthermore, as long as Detroit remains a No. 2 labor area by WMC definition, provisions of this order remain in force. A concurrent "nuisance" regulation is the 1 per cent limitation on use of technical personnel on civilian



TRUCKS: Assembly lines at Chevrolet plants are producing a heavy volume of military and essential civilian trucks. Shown here are the various current models, including Army, Navy, school bus chassis and cab, light delivery and ton-and-a-half chassis and cab

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goods engineering, which should be tossed in the ashcan.

Meanwhile local draft boards are refusing to recognize WPB certification of tool and die workers for reconversion work as grounds for deferment. Similar threats hang over machine tool builders and in fact any other employer active in reconversion.

Although the Surplus Property Board has announced the granting of permission to contractors for purchase of government-owned equipment in their possession, little has been done for contractors not in possession of such tools who under the present setup will have to wait two or three months while such equipment becomes idle, is screened by the services and is declared surplus to RFC. Along the same line, regulations prohibiting the release of frozen company-owned equipment remain to be lifted.

Hold War Plants "Expendable"

A broader interpretation of the War Surplus Disposal act, as far as it relates to the selling or leasing of government-owned war plants and machinery to industry, is held vital by J. H. Marks, Packard executive vice president, who was instrumental in the launching of the government's Defense Plant Corp. Packard's Rolls-Royce and marine engine plants, in fact, are listed as Plancor No. 1, the first facility equipped by DPC. Mr. Marks declares war plants should be considered as expendable as combat weapons, since the speed of their erection often meant sav-

ings of American lives (the Ford Willow Run plant cost about \$100 million, or roughly the equivalent of one battleship); therefore they should be sold or leased at fair prices, now making allowances for the artificially high cost of first construction, war-dictated plant protection features not needed now, age and obsolescence.

One of the most logical but at the same time unlikely, suggestions for disposal of the Willow Run bomber plant has been to sell or lease it to the UAW-CIO for its full management, staffing and operation. For years, the UAW has been trying to tell other managements how to run their business, how much to pay employees, how long to work, how much production to turn out, etc. Here would be a chance for the union to have a nice, big plant of its own and it could institute any and all regulations, wage rates, productivity, and discipline it cared to, with no one objecting. Commenting on the idea, a union spokesman says it would be impossible because the large manufacturers have a throttle-hold on their suppliers, so the union could obtain no materials or parts; and further the union has only a couple of million dollars in its treasury so could not afford the investment, particularly with current dues payments shrinking fast. Meanwhile R. J. Thomas, president of the UAW-CIO, visited with President Truman to explain unemployment prospects in Detroit, and came away with the observation, "Things look pretty black." His next move is to visit with

Henry J. Kaiser on the West Coast to try to persuade him to acquire Willow Run for production of some Kaiser Kars.

There has been considerable to-do in WPB and industry circles over an alleged dire shortage of large body presses required for production of body stampings. Mr. Nelson in his recent conference explained this situation looked much better now. Asked for details, he said some of the press manufacturers had employed outside engineering services on a jobbing basis to assist on the engineering of new installations, relieving the undermanned press companies of some of this work and thereby speeding ultimate delivery of the equipment.

Actually, according to one of the larger press manufacturers, there is no shortage of presses in the autobody shops, at least as far as the larger double-action and triple-action units are concerned. In few if any cases were these heavy presses moved to make way for war work. Some were converted to war stampings, both steel and aluminum, but their reconversion is only a matter of switching dies. Most of the Fisher stamping plants, Briggs, Murray, Ford, De Soto and other leading suppliers of body stampings have all their prewar equipment in place and should be able to start production as soon as new dies are available. The hue and cry over the slowness of deliveries on new presses, in this observer's opinion, relates to orders placed for expansion of capacity beyond the prewar level. Obviously this equipment will not be needed for a year or more, but the buyers are characteristically keeping the heat on the builders.

Hudson Meeting Protested

Total number of common stockholders of Hudson Motor Car Co. represented by Carsten Tiedeman, regional WPB director, at the Hudson stockholders meeting was incorrectly stated here last week. Actually he held proxies for about 406,000 shares out of a total of 1,596,000 shares outstanding, and 1,188,000 shares voting at the meeting. Mr. Tiedeman, who is a brother of Mrs. Roy D. Chapin, widow of a former president of Hudson, withdrew his proxies, leaving 782,000 shares actually voting, or some 16,000 short of a majority. On this ground, Tiedeman protested the legality of the meeting, but some legal advisers say he should have withdrawn his proxies before the meeting to make their dissent authoritative. Kernel of the dispute was an offer made earlier to the Hudson management by a New York banker said to represent the Fisher brothers of Detroit to buy 400,000 unissued Hudson shares at book value of \$22.61 each.

The offer was not accepted and there appears doubt it will be remade. If such a deal were concluded, the purchase together with the support of the 406,000 proxies held by Mr. Tiedeman and backing the Fishers, would give the brothers control of the company, at a cost to them of around \$9,000,000.



WENDELL H. WELCH



COL. GRAHAM B. TRAINER

Colonel Trainer has been named general manager of Chrysler Corp.'s China service contract and Mr. Welch has been appointed manager of the executive division of the contract in Detroit. The contract involves the establishment in China of 15 large repair shops for the maintenance of thousands of trucks throughout China and on the Ledo and Burma roads. Projects will require about 500 American engineers, technicians and mechanics, as well as about 3000 Chinese.

During the past three years, Colonel Trainer has been working with the Army on supply problems in the war theaters. Mr. Welch will supervise the employing and training of mechanics for the work, procuring and shipping tools to China, and act as liaison with government agencies

Many foundries find one molybdenum steel analysis suitable for all their castings, whether normalized or quenched and tempered.



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MEN of INDUSTRY



FRANK C. HASSE

Frank C. Hasse has been elected vice president, Mechanical Department, Oxweld Railroad Service Co., a unit of Union Carbide & Carbon Corp., New York. He has been associated with the Oxweld company since 1913.

William Seymour Jr. has been elected assistant vice president, Joseph T. Ryerson & Son Inc., Chicago. Since 1936, he has been general superintendent of the Ryerson Chicago plant, and labor relations manager of the entire group of 11 Ryerson steel service plants. Merle A. Miller has been appointed assistant treasurer of the Ryerson company. He also will retain his position as manager of the credit division.

Adolph G. Schroeder has resigned his position in the machinery and equipment department of Iron & Steel Products Inc., Chicago. No successor has been named.

John W. Lohnes, formerly assistant general manager of sales, Vanadium Corp. of America, New York, has been appointed Chicago district sales manager, succeeding the late Le Roy F. Johnson. Lawrence C. Miller, formerly assistant treasurer of the corporation, has been elected treasurer.

Roy E. Anderson has been elected president of the A. F. Anderson Iron Works, Chicago. He is the son of the late founder of the company and was formerly vice president and secretary. E. E. Anderson has been elected vice president and secretary while Harry Silberman has been elected treasurer.

J. P. Dods, Norristown, Pa., has resigned as director of advertising, Columbia Steel & Shafting Co., Carnegie, Pa., Edgar T. Ward's Sons Co., Pittsburgh, and Summerill Tubing Co., Bridgeport, Pa. He plans to open his own office soon as sales and advertising counsel.

George W. Walton has assumed the



H. A. FORSBERG

post of manager of drilling machinery sales, International Derrick & Equipment Co., Columbus, O. He was previously associated with Clark Bros. Co. Inc., Olean, N. Y.

Henning A. Forsberg recently was appointed manager of operations for all works of Continental Foundry & Machine Co., East Chicago, Ind. He has been associated with the company since October, 1915, and had been general superintendent of the Chicago Works since 1931. J. Edwin Johnson, who has been associated with the company since 1922 and as sales engineer since April 1, 1944, succeeded Mr. Forsberg as general superintendent, Chicago Works.

Lieut. Joseph C. Belden Jr., returned after two and one-half years active duty with the Navy, has been elected assistant secretary, Belden Mfg. Co., Chicago. He is son of the late founder of the company and a director since 1937.

E. O. Paullin has been appointed factory representative and welding engineer in Detroit for Una Welding Inc., Cleveland.

William J. Scott has been appointed assistant general manufacturing manager, Chevrolet Motor Division, General Motors Corp., Detroit. A veteran of 30 years continuous service with Chevrolet, he had been manager of the division's gear, axle and forge plants in Detroit since 1939 and also, since 1942, in charge of war production at Chevrolet aluminum forge plants in Muncie, Ind., and Saginaw, Mich.

Miles K. Smith, metallurgical engineer, has recently become associated with William H. Phillips, vice president, and Norman F. Tisdale, chief metallurgist, Molybdenum Corp. of America, Pittsburgh. Mr. Smith has been connected with the steel industry in various branches for 15 years and has had a wide experience in the procurement and use of most of the alloys used in the indus-

try. He will act in the capacity of sales and service engineer for the corporation.

Paul W. Bernhard has been appointed advertising manager, Morse Chain Co., Ithaca, N. Y. He was formerly associated with Bell Aircraft Corp. and Curtiss-Wright Corp. at Buffalo.

Frank M. Aldridge has been appointed general sales manager, Ohio Tool Co., Cleveland. He was formerly deputy regional director in Cleveland of the War Production Board.

S. Leroy Crawshaw has been appointed manager of engineering and sales, Western Gear Works, Lynwood, Calif. W. A. Witham has been appointed assistant manager of engineering; P. L. Bannan, company treasurer, has been appointed manager of manufacturing for all plants, with G. A. DeArmand as his assistant.

Falcon Bronze Co., Youngstown, O., has appointed T. C. Watts, assistant manager in charge of personnel and supplies; J. C. Lepatta, tube foundry superintendent; Warner A. Wick, assistant manager in charge of production.

H. A. Schimberg has been appointed director of purchases, LaPlant-Choate Mfg. Co. Inc., Cedar Rapids, Iowa.

Stanley G. Disque has been appointed Indiana engineering service representative, Sterling Alloys Inc., Woburn (Boston), Mass.

Boyd E. Cass has been appointed welding engineer, Foote Mineral Co., Philadelphia. He was formerly with Carnegie-Illinois Steel Corp.'s Youngstown, O., district works, and Baldwin Locomotive Works, Eddystone, Pa., where he was senior metallurgist.

John T. Benton has been elected president, Engineers Club of Birmingham, Ala. Ralph Y. MacIntyre was elected vice president, and Sprigg C. Ebbert, secretary-treasurer.

C. Wohlhuter has been elected vice president and re-elected secretary of Burgess-Norton Mfg. Co., Geneva, Ill. W. T. Crane, formerly assistant purchasing agent, has been appointed assistant to the president, Charles M. Burgess.

Rowe D. Staub has been appointed sales manager, Hood Refining Co., Greensburg, Pa. He was previously associated with Sealed Power Corp., Muskegon, Mich.

G. P. Vincent, manager of the sales development and technical service department, the Mathieson Alkali Works, New York, has been appointed to the newly created position of technical director. In addition to his former duties, he



R. S. REYNOLDS

will direct research and technical development and advise on technical matters concerning plant operation. In these latter capacities, he succeeds R. E. Gage, who was director of research and development for Mathieson for 14 years and has now been appointed technical adviser of the company.

R. S. Reynolds, president, Reynolds Metals Co., Richmond, Va., has been elected chairman of the board of directors, Reynolds Internacionale de Mexico, which will operate an aluminum plant in Mexico.

A. M. Andrews, veteran war pilot, has joined the staff of the Briggs Clarifier Co., Washington, as one of the chief service engineers for the Aviation Division.

P. V. Black has been appointed Pacific district operating manager, Graybar Electric Co. Inc., New York, with offices in Los Angeles.

Erson V. Ogg has been appointed director of the recently established Industrial Relations Department, Pittsburgh Plate Glass Co., Pittsburgh. Clarence J. Moser has been named director of labor relations, replacing the late Fred Keightley.

C. E. Stephens, vice president, Westinghouse Electric Corp., Pittsburgh, has retired from active service with that company after 45 years of service.

Westinghouse Electric Supply Co., Chicago, has made the following appointments: Albert L. Wiegenstein, apparatus and supplies manager for the north Pacific district; C. M. Reynolds, manager of the Corpus Christi, Tex., branch; G. H. Linberry, apparatus and supplies manager for the Pittsburgh district; Charles R. Lee, manager of the New Orleans branch; L. J. Clay, manager of the San Antonio, Tex., branch; and H. E. Bailey, district utilities manager



H. C. CRANDALL

for the north Pacific district with headquarters in Seattle.

Horace C. Crandall, who has been placed on inactive service from the Navy, has opened an office as a consulting engineer at 475 Fifth avenue, New York. Prior to entering the service he was president of the Crandall Engineering Co., Boston. He is specializing as a consultant in design of waterfront and heavy structures, including drydocks, marine railways, foundations, piers and wharves, shipyard facilities and harbor works.

Harry J. Kelley has retired as first vice president and general manager, Dominion Steel & Coal Corp. Ltd., Sydney, Nova Scotia. Mr. Kelley had been associated with that corporation for 21 years and prior to that was with the Lackawanna Steel Co. and its successor, the Bethlehem Steel Co., for a period of 35 years, at Lackawanna, N. Y. He will remain a director of and will act as a consultant to Dominion Steel.

Lieut. Col. John Kennedy Beeson, who recently completed his duties with the United States Strategic Air Forces in Europe, has been elected executive vice president, Pittsburgh Steel Co., Pittsburgh. Colonel Beeson is the son of the late Charles E. Beeson, one of the founders of the company. When he enlisted in the Air Corps in May, 1942, he was vice president in charge of sales for Pittsburgh Steel.

Fred Brown has been appointed staff engineer, general sales department, Copperweld Steel Co., Glassport, Pa. He was formerly New England sales engineer for the company. H. M. MacDougal has succeeded Mr. Brown in the New England territory.

Leo D. Cosart, widely known automotive executive who has been with Dodge and Plymouth divisions, Chrysler Corp., Detroit, for nearly 20 years, has joined J. O. Fisher as a partner in



DR. HARRY WHITTAKER

the Dodge dealership at Portland, Oreg. He will leave Detroit June 15 and assume his Portland responsibilities July 1. Mr. Cosart was named sales manager of the Dodge truck division in 1940 and since the war has been staff executive at the Chrysler tank arsenal in Detroit.

Dr. Harry Whittaker, nationally known diamond expert and crystallographer, has been appointed research head for the Koebel Diamond Tool Co., Detroit. Dr. Whittaker will continue research begun for the National Academy of Science, grading industrial diamonds according to their crystal structure and specific ability. He formerly was instructor of crystallography at the Massachusetts Institute of Technology and later headed the ceramic research department of the Crane Co., Chicago.

Samuel S. Williams, president, Bradford Machine Tool Co., Cincinnati, retired May 31 but retains a place on the board of directors. He started with the firm 44 years ago and has been president since 1927. J. R. Stewart succeeds Mr. Williams as president.

L. R. Husa has been elected president, Albina Engine Works, Portland, Oreg., advancing from the position of vice president and general manager to succeed George Rodgers who has retired. The latter founded the Portland Steel Shipbuilding Co. in 1906 which later joined the Albina firm. Mr. Husa, formerly with Todd Shipyards Corp., New York, has been with Albina since 1922.

F. H. Kilberry has resigned as president and general manager, Atlas Imperial Diesel Engine Co., Oakland, Calif.

H. V. Erben has been elected a director of Allegheny Ludlum Steel Corp., Brackenridge, Pa. Mr. Erben, who is commercial vice president and assistant general manager, Apparatus Division, General Electric Co., Schenectady, N. Y., succeeds Ralph J. Cordiner, who has re-



C. W. BETTCHER

Who has been elected president of Eastern Machine Screw Corp., New Haven, Conn., and who will still direct sales and advertising, as reported in STEEL, May 28, p. 92



CHARLES M. JONES

Who has been appointed vice president in charge of engineering, John A. Roebling's Sons Co., Trenton, N. J., as noted in STEEL, May 7, p. 95.



E. R. JOHNSON

Recently named divisional superintendent, Canton Steel Division, blast furnace, and coke plant, Republic Steel Corp., as noted in STEEL, May 28, p. 94.

signed from the Allegheny Ludlum board because of the pressure of his duties as vice president and assistant to the president of General Electric Co.

Henry A. Lowery of the Seaboard Steel & Iron Corp., Baltimore, has been elected president of the Steel Club of Baltimore, succeeding Warren D. Bourquin, Republic Steel Corp. John A. Malloy of Joseph T. Ryerson & Son Inc. has been elected vice president and Joseph A. Doyle Jr., Jones & Laughlin Steel Corp., secretary and treasurer. C. W. Test, Youngstown Sheet & Tube Co., has been made an honorary member. Mr. Test is now of Philadelphia and was formerly of Baltimore.

Merle J. Trees has been elected to the

newly created position of chairman of the board, Chicago Bridge & Iron Co., Chicago. Horace B. Horton was elected president to succeed the late George T. Horton. Mr. Trees formerly was executive vice president of the company while Mr. H. B. Horton was vice president and treasurer and will continue to hold the latter position as well as that of president.

John M. C. Pease, formerly advertising manager, and Frank J. Simpson, assistant sales manager, have been elected vice presidents, Electric Household Utilities Corp., Chicago.

E. E. Robbins of Tulsa, Okla., has been appointed director, Division of Materials, Petroleum Administration for

War, Washington. He was formerly a special representative on petroleum matters for the United States Steel Export Co., New York. William Howard Collins has been named assistant director of the division.

J. Frederick Rogers, president, Beals, McCarthy & Rogers, Buffalo, has been elected second vice president, Buffalo Chamber of Commerce.

A. G. Trumbull, chief mechanical engineer for the Advisory Mechanical Committee of the Chesapeake & Ohio, Nickel Plate and Pere Marquette railroads, has been appointed general mechanical engineer for the three railroads. He has been identified with these companies since 1929.

OBITUARIES . . .

Frank Willett Walton, 76, former manager, Westinghouse Electric Corp.'s Equipment Division in Bloomfield, N. J., died May 20 in Montclair, N. J.

Guilford Duncan, 67, president, the Ludlow-Saylor Wire Co., St. Louis, died recently in that city. He joined the company in 1900 and became head of the firm in 1911.

Capt. Frank Taylor Cable, 81, consulting engineer, Electric Boat Co., Groton, Conn., died May 22 in New London, Conn. A leading figure in submarine construction for more than 50 years, Captain Cable was commander of the HOLLAND, the first successful submarine constructed in the United States and accepted by the Navy in 1900.

Alfred Marshall, 60, for many years employment manager of the Chevrolet Motor Division, General Motors Corp., in Detroit and Flint, Mich., died re-

cently at Tucson, Ariz. He joined Chevrolet at Flint in 1919 and retired from active business in 1942.

Ransome T. Lewis, 77, general manager of the American Bridge Co.'s plant in Elmira, N. Y., and former president of the Elmira Precision Tool Co., died recently in that city.

Rauley O. Mongan, 44, consulting engineer and vice president of Metals Reclaiming Corp., Spencerport, N. Y., died May 22 in New York. He was formerly an engineer with SKF Industries Inc., Philadelphia, and since the beginning of the war has been engaged in research for the Navy laboratory, Army Ordnance, and Chemical Warfare Service.

C. W. Spaulding, 60, sales manager, Ewart Division, Link Belt Ordnance Co., Indianapolis, died May 25, at the Union League Club in Chicago, where he was attending a conference.

Harry Gross, president, Atlantic Metal

Products Co., Long Island City, N. Y., since he founded it in 1932, died recently at his home in Brooklyn, N. Y.

Edwin R. Fellows, 80, president, Fellows Gear Shaper Co., Springfield, Vt., died at his home May 22, as noted in STEEL, May 28, p. 75. He founded his company in 1896 and developed many unique machines and cutters, holding about 35 patents covering gear manufacturing equipment. In 1899, he received the John Scott medal "for a machine and cutter for generating gear teeth."

J. Howard Chambers, 87, former president of Chamber Bros. Co., Philadelphia, manufacturing machinist, died May 22. He retired in 1941 after serving the company 65 years, the last 30 as its president.

Robert H. Darnton, 63, superintendent, forge plant, Buick Motor Division, Flint, Mich., and associated with Buick for 33 years, died May 28.

Light Metals Industry Conference Planned at Seattle June 21-22

Objective of meeting will be postwar maintenance and operation of war-created industry in 11 western states. Producers, technologists, economists and government officials to participate in discussions

NATIONAL attention will be directed to the light metals industry of the West—its spectacular wartime development and its postwar prospects—when the Western States Council holds a two-day conference on this subject in Seattle June 21 and 22.

Attending the meeting will be producers, technologists and economists in the light metals field, government officials charged with the disposal of surplus war property, several western senators and congressmen who have been prominent in light metals developments. Representatives of transportation lines and power companies also are expected to attend.

Objective of the conference is postwar maintenance and operation of an integrated light metals industry in the eleven western states under private ownership.

The Western States Council was organized in October, 1944, to co-ordinate western action on matters of regional concern. It is made up of executives of chambers of commerce in all eleven western states. Christy Thomas, executive vice president, Seattle Chamber of Commerce, is president of the council.

First project undertaken by the organization was an intensive study of the West's steel industry and its post-war potentialities. Following a two-day conference held at Salt Lake City in February, a comprehensive program was set in motion to retain this industry as a permanent and integrated factor in western economy. Private ownership and operation is the goal.

Development Was Spectacular

The urgent need for light metal in the war production program brought great expansion to the West's aluminum and magnesium industries. The most spectacular development of aluminum reduction has taken place in the Pacific Northwest, where new war plants have been built to take advantage of the low-cost electrical energy.

But the light metals industry of the West is not complete. Concentrated in the Pacific Northwest are five new aluminum reduction plants and one magnesium reduction plant. There is but one rolling mill, located at Spokane. There are no extrusion plants in Washington and Oregon, and those in California and Arizona are widely removed from the reduction plants in the Pacific Northwest.

Soon to be in operation is a new plant at Salem, Oreg., owned by the Defense

Plant Corp. and operated by the Columbia Metals Corp. which will produce alumina from native Pacific Northwest clays. There are extensive deposits of alumina-bearing clays in the region and it is believed the Salem plant may point the way to economical utilization of these clays supplementing the importation of bauxite ore.

If an integrated Western industry, encompassing every step in the production cycle from raw material to finished products, can be developed it will be of great importance to the entire area.

Pacific Northwest Yards Still Recruiting Labor

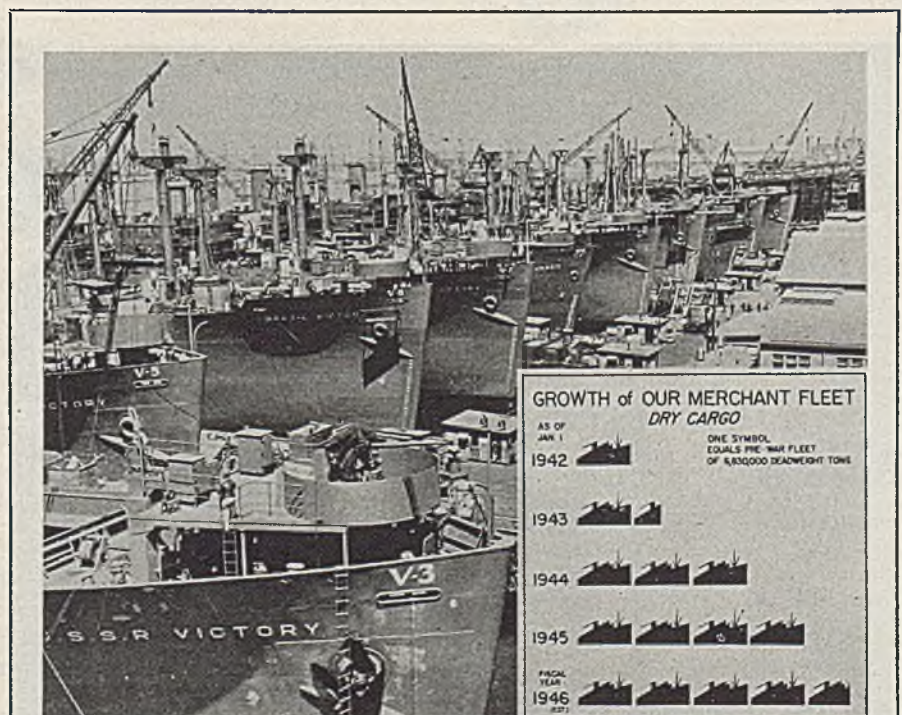
Rumors of cutbacks are denied by officers of Tacoma's Todd Pacific shipyard. The company is recruiting for labor in all the Pacific Coast states and present contracts call for 2000 additional skilled

workmen. Word from the Navy states no reduction in the present program of navy construction is contemplated in the Pacific Northwest area.

Coast repair plants are booked to capacity and the situation will be more acute when a large fleet of merchant ships, released from the Atlantic comes to this coast to augment the supply line operating to the South Pacific. A. F. Hardy, state manpower director, has appealed to labor to remain on the job, adding that 7969 additional workers are needed in the area in industries vital to the prosecution of the war.

In his report to stockholders, C. L. Egtvedt, chairman of Boeing Airplane Co., outlined the company's conception of a sound postwar aircraft program. It includes (1) A minimum of at least two preliminary design studies for each type of aircraft, including research required in connection with such studies. (2) Construction of one or more experimental models of each type of aircraft selected as a result of previous preliminary design studies. (3) Production of the latest model aircraft of each type in quantities sufficient to develop production techniques, to permit complete proving through group maneuvers under all service conditions, and to give the United States air superiority.

Boeing announcement states that more B-29 Superfortresses are being turned out at the Renton Boeing plant than in any other airplane factory.



HOW FLEET HAS GROWN: American merchant shipyards have built four ships for every prewar vessel we had. Our fleet of Victory, Liberty, C-type and other ships has reached an alltime high of 3500 dry cargo and 900 high-speed tankers. During 1944, these ships moved more than 72 per cent of the 78,500,000 cargo tons shipped from the United States

WING TIPS

Liberty ships equipped with heavy metalworking equipment and are transformed into floating repair units to service Superfortresses in Pacific area. Work to tolerances of .0001 of an inch. Speeds maintenance of B-29s

AIRPLANE metal work of all kinds now is being performed at sea in Liberty ships converted by Air Technical Service Command into floating B-29 repair shops. A number of these vessels are now anchored off the Marianas, where they perform "fourth echelon maintenance," or complete and heavy overhaul of aircraft accessories requiring special tools and personnel with special training.

The 440-foot Liberty ships are fitted with machine shops, facilities for electric and acetylene welding, sheet metal work, heat treating, and electro-plating; they also are equipped for the repair of carburetors, turbo-superchargers, instruments, electrical equipment, and other components of the giant planes.

Purpose is to provide maintenance as soon as air strips in a newly-taken area have been completed, thus saving the two-to-six-month period normally required to set up comparable installations ashore. When shore installations are functioning fully, the "Aircraft Repair Units (Floating,)" which is the formal name of the new organizations, may haul up anchor and proceed to a more advanced destination, where they start their work all over again.

An unusual feature of the floating

air depots is the flight deck, constructed of a special nonskid steel, above the forward portion of the main deck, from which helicopters operate. The rotary wing craft are used to fly key personnel, small parts, and small tools between ship and shore. The vessels also carry "ducks," jeeps with trailers, and work boats; they are swung over the side by the ship's booms when required.

The unit's work has won the commendation of B-29 tactical organizations and has turned out a variety of work, from clips which hold a resistor in governor heads for B-29 Hamilton Standard propellers to gears for Seabee bulldozers. Work is organized for the manufacture of individual items, or small quantities of a given item, rather than for mass production, in accordance with the requirements of the outfits making use of the floating air depot's services.

The machine shop in the First Aircraft Repair Unit is equipped to work to tolerances of .0001 of an inch. It is equipped with the following heavy machinery: 1 geared-head engine lathe, 16-inch swing; 1 geared-head tool room lathe, 12-inch swing; 1 screw-cutting bench lathe, 8 1/2-inch swing; 1 floor type high speed radial drill with 24-inch

capacity; 1 universal high speed horizontal milling machine; 1 universal metal shaper, with 24-inch stroke; 1 power hack saw; various drill presses and grinders.

Machinists aboard the vessel often have trouble centering work in lathes when out at sea, as they did on the voyage across the Pacific. Most work, however, is done in a harbor or anchorage, and this is therefore no problem.

A "former", or electrically driven hammer for turning flanges and performing similar work, is the most interesting piece of equipment in the sheet metal shop. It saves many hours of hand work daily and eliminates the need of making wooden forms on which ribs and other irregularly shaped pieces of sheet are hammered out. The former is not normally found in AAF maintenance units in the field.

Members of the sheet metal department may move their hand tools ashore to work on the B-29s themselves. This becomes a necessity when flak holes in wings and stabilizers have to be patched, because these assemblies are too big to fit into the Liberty ship hatches.

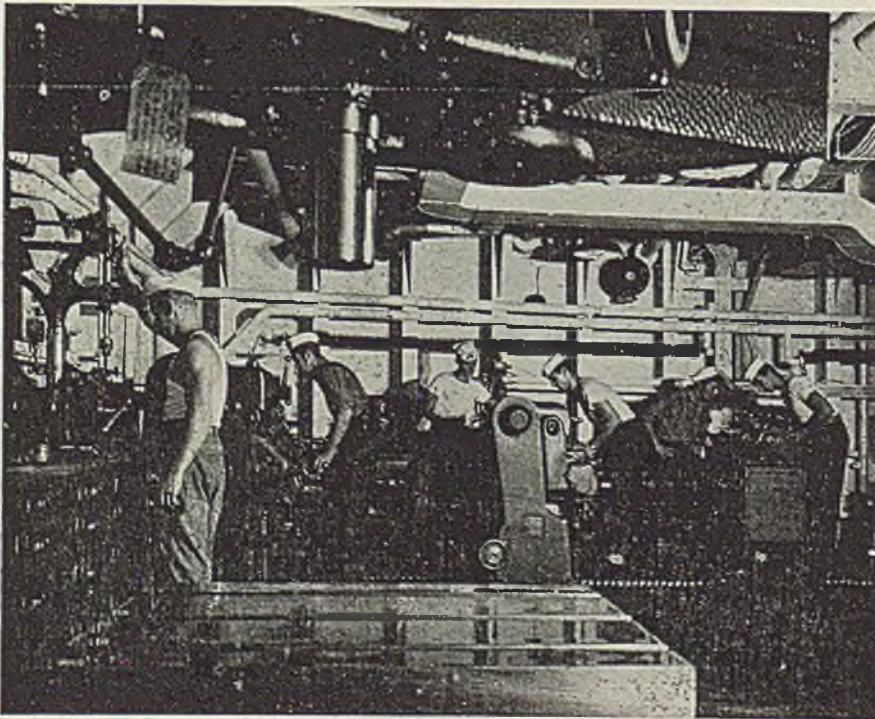
Large supplies of bar stock, sheet metal, and similar materials are carried in the holds of the vessel. Because of the distance from the mainland, scraps are saved; efforts are made to find a use for them, when possible. One floating air depot ran out of metal stock but found a supply in a nearby wrecked Japanese sugar refinery. Welders cut I-beams and other pieces of metal from the bomb-blasted mill; back at the ship the rust was cut off, and the steel was found to be a life saver.

On the trip to the Marianas, metal workers made themselves useful. They constructed a shop on the deck for the carburetor repairmen, who found that their cubicle below decks was unsuitable. Fuel fumes quickly filled their original department, and made work impossible. The new site provided adequate ventilation. They also built a supercharger shop on deck, after men who worked near the supercharger specialists in one of the holds complained of the noise caused by the spinning of the rotor mechanism during balancing. The two shops were made of sheet, welded in place. Members of the vessel's paint-dope-and-fabric shop put on the finishing touches.

Personnel for the ship were specially sifted by ATSC to find the best possible mechanics, who were later sent to schools for advanced training in their specialties.

Aviation War Conference To Be Held in Los Angeles

An Aviation War Conference of the American Society of Mechanical Engineers to be held June 11 to 14 at the University of California at Los Angeles,



Machine shop aboard a Liberty ship houses a floating aircraft repair unit developed by the Air Technical Service Command to provide heavy maintenance facilities for B-29s based in the Marianas. Men in the background work at lathes; man on the left uses a drill press; table and head of a radial drill are shown in foreground

BAR-STOCK TO FINISHED PART

18-8 STAINLESS... 30% BETTER

TOOL LIFE

SUNICUT...

Keeps Small Tools Working Longer, Produces Better Finish

An eastern manufacturer was turning out 18-8 stainless-steel eye-terminals for the Navy on a Simmons Micro-Speed No. 2 Turret Lathe . . . cut-off and shape, rough turn, form, spot drill, drill, ream, and circular-form turn.

The material was 1" round annealed bar-stock, cut at a speed of 130 s.f.p.m. and spindle speed of 500 r.p.m. All tools were high-speed steel, except the rough turn and form tools which were carbide-tipped.

Short tool life . . . and poor finish, which necessitated hand-filing, were a problem,

until a Sun Cutting Oil Engineer was called in, studied the different operations, and recommended Sunicut. With this transparent, sulphurized cutting lubricant, tool life has increased 25% to 30%; finish is now excellent; the hand-filing has been eliminated. Reamers now last 600 hours; forming tools average 280 hours.

If you're troubled by frequent set-up changes, poor finish, or other metal-cutting problems, talk with the Sun Cutting Oil Engineer near you, or write to . . .

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SUN INDUSTRIAL PRODUCTS

OILS FOR AMERICAN INDUSTRY

will bring together in the four evening sessions of the program some of Southern California's outstanding technical men in the aircraft industry. New aircraft techniques and a projection of post-war plans for the industry will be discussed in 38 papers at 16 separate meetings. The conference is under auspices of the Southern California Section of the ASME.

Dr. Clarence A. Dykstra, provost of the University of California at Los Angeles, will address the opening session Monday evening, June 11. The society and the university are co-operating in a conference as a contribution to the war effort.

Following Dr. Dykstra's address there will be two papers on gas turbines and jet propulsion, both illustrated by films. M. J. Zucrow, executive engineer, Aerojet Engineering Corp., Azusa, Calif., will discuss "Jet Propulsion Principles and Rockets for Assisted Take-off." Col. Homer Boushey, commanding officer, 412th Fighter Group, Bakersfield Army Air Field, Bakersfield, Calif., will speak on "Jet Propelled Airplanes."

The meetings on Tuesday evening will be devoted to heat transfer, standards and quality control, rubber and plastics, instruments and regulators, and applied mechanics.

A second heat transfer session will be held Wednesday evening, simultaneously with sessions on management, production, metals engineering and a second meeting on gas turbines and jet propulsion.

On Thursday evening, concluding ses-

sions will take up heat transfer, production, hydraulics, applied mechanics and power plants.

Recasting of Fisher Body Plants Being Considered

A rather complete recasting of Fisher Body plants is in the works, and all details have not yet been released. For one thing, the Fisher Lansing plant will produce the bodies for interim Cadillac models, according to present plans, since the Fleetwood plant in Detroit is not readily available. Further, the Fisher No. 2 plant in Flint, source for Chevrolet bodies, is being taken over by Chevrolet, indicating the likelihood of a new Fisher plant in that city. Two new Fisher stamping plants, in Hamilton and Columbus, O., already have been announced, and there will be a concentration of Chevrolet body assembly operations in the No. 1 Cleveland plant as soon as the B-29 engine nacelle job can be moved out, with the No. 2 Cleveland or Memphis, Tenn., Fisher plants possible destinations.

Just recently announced is a new five-unit plant which Chevrolet and Fisher Body will build at Flint, providing 1,100,000 square feet of floor space, presumably for manufacture of the proposed lighter-weight lower-cost Chevrolet to be introduced to meet the competition of the light-weight economy Ford model (which now seems fairly certain to have the new 5-cylinder in-line Ford engine under tests for the past four or five years). The

new Chevrolet manufacturing project in Flint will have capacity for production of 600 cars per 8-hour day, and will include an engine plant, body shop, power house test track and other facilities.

10,000 Corsair Fighters Produced in Three Years

Ten thousand Corsair fighters have rolled from assembly lines for service with the U. S. Navy, U. S. Marine Corps or the Royal Navy since the gull-winged F4U, fastest shipboard fighter in the world, was placed in production three years ago.

Of this total, more than 6000 were produced by the Chance Vought Aircraft Division of United Aircraft Corp., designer of the Corsair, and more than 3000 by the Goodyear Aircraft Corp., Akron, a licensee. The remainder, 735 airplanes, was built by Brewster Aeronautical, Long Island City, N. Y. and Johnsville, Pa.

Only Vought and Goodyear are currently producing Corsairs, the Brewster contract having been terminated more than a year ago.

Continual design improvements have brought increases in performance and armament to keep the Corsair in the forefront among the world's most versatile fighters. To its original armament of six .50 caliber machine guns have been added a 2000-pound bomb load and the devastating firepower of eight 5-inch rockets launched from racks under the wings. Also, certain Corsair models carry four 20-millimeter cannon in place of the machine guns.

Maguire Industries Enter Powder Metallurgy Field

Maguire Industries Inc., Bridgeport, Conn., has entered the powder metallurgy field by cash acquisition of stock of the Ferrocart Corp. of America and the Micro Products Corp., both of Hastings-on-Hudson, N. Y.

Ferrocart produces parts from powdered metals, and Micro is a sales concern. A several hundred thousand dollar expansion program is planned.

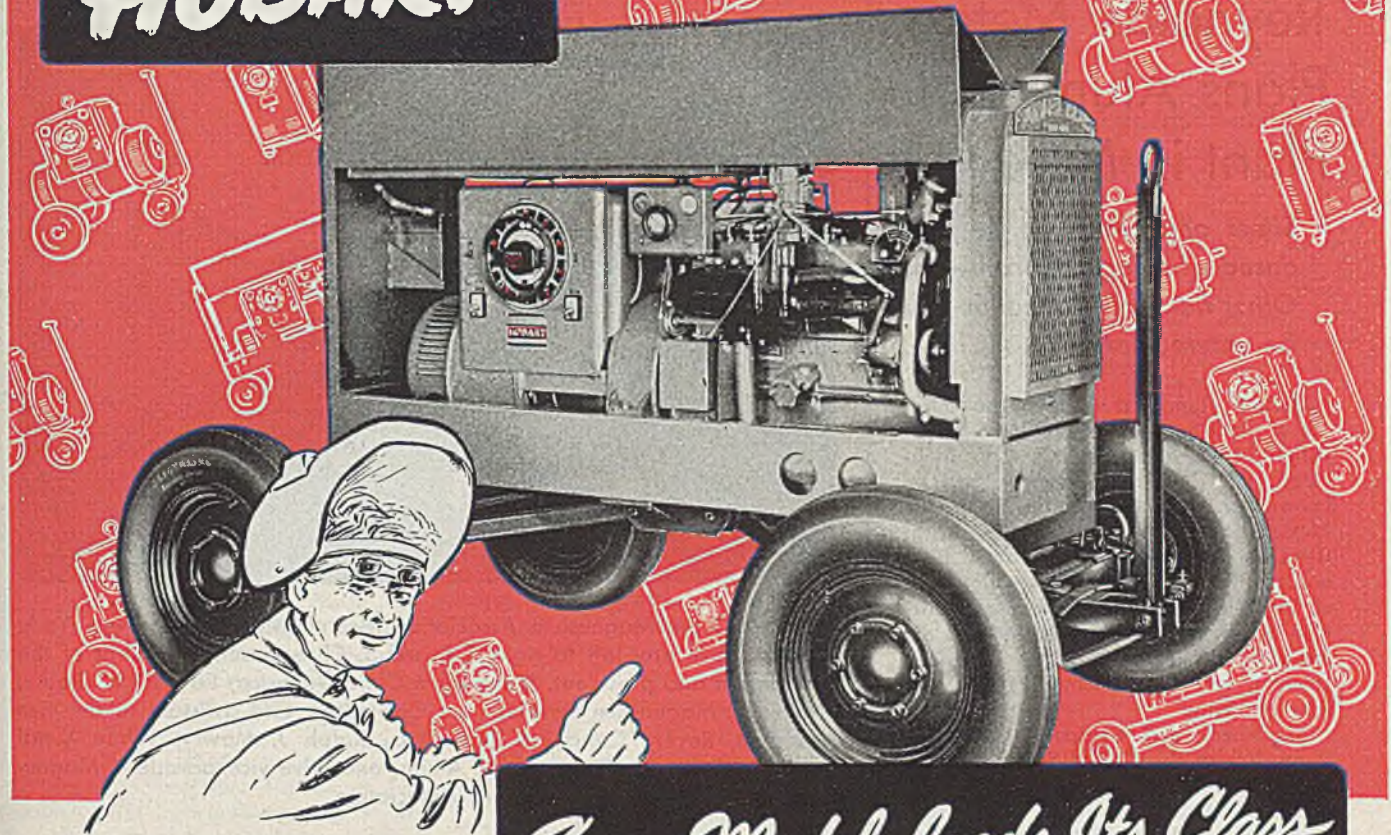
Earl Patch, formerly associated with the Moraine Products Co., General Motors Corp.'s Powder Metallurgy Division, at Dayton, O., has joined Ferrocart and will set up a new division to produce powder metal parts for mechanical uses. Ferrocart's present output is largely for electronic equipment.

Russell Maguire, president, Maguire Industries, will be chairman of the boards of Ferrocart and Micro, and Harry Ford, one of the previous owners of Ferrocart and Micro, will continue as president of those two firms. There will be no changes in the operating personnel and the two companies will continue as separate corporate entities.



PINBALL MACHINE GOES TO WAR: Boeing Aircraft Co. production engineers are using part of the mechanism of a pinball machine to check automatically the continuity of B-29 wire connectors. Some of the Superfortress wiring harnesses contain as many as 52 separate wires which formerly were checked individually. This device permits speedier and more accurate tests

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Reynolds Metals Plans Aluminum Plant in Mexico

Sheet and plate will be produced when operations begin. Other fields of fabrication will be entered later

FIRST aluminum company to operate a plant in Mexico has been established by Reynolds Metals Co., Richmond, Va. The new company will be known as Reynolds Internacional de Mexico and will be headed by R. S. Reynolds and his son, J. Louis Reynolds. The former, who is president of Reynolds Metals Co., will be chairman of Reynolds Internacional, and the latter, a vice president of the American concern, will be president of the Mexican company.

Machinery and equipment is being shipped from the United States to Mexico for immediate installation as soon as the plant is constructed. The company will produce aluminum sheet and plate, and later it plans to enter other fields of aluminum fabrication, such as forgings, extrusions, rod, bar, cable, and powder and paste for paint. At the outset it will roll various kinds of foil, including foil made of aluminum, lead and tin, and will process such products by coloring, embossing and printing, for use as wrapping and packaging material.

Manager of the Mexican plant will be Edwin Taranger, who has been in Mexico for the last two months.

Seventy-fifth Anniversary Observed by Zinc Company

Illinois Zinc Co., Chicago, is observing the seventy-fifth anniversary of its founding, James A. Hill, president, announced last week.

The company operates a sheet rolling mill in Peru, Ill., and a strip rolling mill in Chicago. Hull and boiler plates for the Navy, lithograph plates for printing battle maps, sheet zinc for lining powder boxes, and many other products which go into war materiel are produced by the firm. The dry cell battery program of the armed forces also relies heavily on the Illinois company for raw material.

Reconversion to peacetime production, Mr. Hill said, will present no difficulty, as the manufacture of war items has resulted in no great departure from peacetime practice. The company is anticipating a huge postwar demand, and will announce new zinc-base alloys when production curbs end.



Meeting of the Magnesium Association recently was held in New York. Shown above are, left to right, Edward S. Christiansen, president of the association and president, Magnesium Co. of America; Edward W. Rouse, chairman, Magnesium Development Committee, and assistant to the vice president, Revere Copper & Brass Inc.; Ralph J. Mowry, White Metal Rolling & Stamping Corp.; T. W. Atkins, executive vice president, Magnesium Association

BRIEFS

Paragraph mentions of developments of interest and significance within the metalworking industry

Montgomery Elevator Co., Moline, Ill., will form a subsidiary to operate in Mexico, Central America, and South America.

Calco Machinery Co., 1420 Chestnut street, Philadelphia 2, announces it is exclusive agent in the Philadelphia territory for vertical and toolroom universal milling machines produced by Reed-Prentice Corp., Worcester, Mass.

Thomas Prosser & Son, New York, importers and exporters of carbide tool grinders, mechanical specialties, and special steels, are observing the one hundredth anniversary of the founding of their firm.

Brooklyn Union Gas Co., Brooklyn, N. Y., will spend approximately \$5 million in the coming year in expanding its gas manufacturing facilities by 20 million cubic feet.

U. S. Maritime Commission, Washington, will accept bids until noon, June 18, for construction of three refrigerated cargo ships for United Fruit Steamship Corp.

Susquehanna Wire Rope Co. has been

established at Sunbury, Pa., to make wire rope and cable.

Waterbury Tool Division of Vickers Inc., Waterbury, Conn., will reduce operations from July 1 to July 14, inclusive, for an annual vacation period.

Spriesch Tool Co., Buffalo, plans to make automotive assemblies, vending machines, and other products after the war, Joseph J. Cheney, president, announced recently.

Great Lakes Transit Corp., Buffalo, has announced that stockholders have approved sale of the firm's four vessels, FRED W. SARGENT, ALFRED H. SMITH, GEORGE D. DIXSON, and UTICA, to a shipping company in Valparaiso, Chile, for approximately \$1,735,000. Name of the buyer was not disclosed.

Whiting Corp., Harvey, Ill., has established a \$25,000 scholarship fund at Illinois Institute of Technology to help meet the postwar need for trained engineers.

Poulsen & Nardon Inc., Los Angeles, machine, stamping, and die plant, has been purchased by Solomon Eisenrod, president, Lincoln Machine Co. Inc.,

Pawtucket, R. I. C. J. Nardon will remain as general manager of the Los Angeles plant.

Porcelain Steels Inc., Cleveland, has been reorganized and will be known as Republic Steel Co., Porcelain Steel Division. Don D. Smith is president and treasurer.

Jessop Steel Co., Washington, Pa., has received a clearance of renegotiation proceedings for 1944 from the War Contracts Price Adjustment Board, Washington, and no refund was due the government.

National Forge & Ordnance Co., Irvine, Pa., has issued an illustrated booklet describing operations of its modern forging plant.

Lincoln Electric Co., Cleveland, producer of arc welding equipment, has received preliminary details on what is believed to be the first all-welded hospital building in the United States. The 18-story structure is to be erected at Rochester, Minn.

Process Research Inc., Cincinnati, has received Ohio incorporation papers. Incorporators, all of Cincinnati, are Charles Beltzhoover, president of Beltzhoover Electric Co.; Aldon M. Kinney, president of A. M. Kinney Co.; and James Coombe, president of William Powell Co. The new firm will direct study of industrial processes as a step prior to plant design.

Benge Associates, Chicago, announced that the third Benge sales personnel clinic will be held June 23-30 at New Ocean House, Swampscott, Mass., under direction of Eugene J. Benge, president of the organization.

Monsanto Chemical Co., St. Louis, disclosed that it has begun volume production of Styramic IIT, a new thermoplastic with electrical insulating properties, after six years of research conducted at request of the armed services.

United States Rubber Co., New York, has developed a tough new form of synthetic rubber to seal brass shell cases to steel projectiles in the manufacture of 40-millimeter ammunition.

Metal & Thermit Corp., New York, announced a new arc welding electrode, "Murex Type IITS." It is a mineral-coated electrode with less penetrating arc than "hot rods."

Colonial Bushings Inc., Detroit, has moved to 21601 Hoover road. The firm will carry an expanded line of standard drill jig bushings in stock for immediate shipment.

Meehanite Metal Corp., New Rochelle, N. Y., has concluded a contract with Kel-

vinator Australia Ltd., Adelaide, South Australia. The latter firm is a subsidiary of Nash-Kelvinator Corp., Detroit, and is making similar machinery and refrigerators.

Lempco-International Inc., Cleveland, will distribute Neapco universal joints and parts to all countries outside the United States, except Canada. The Neapco line is manufactured by New England Auto Parts Corp., Pottstown, Pa.

Overly Mfg. Co., Greensburg, Pa., has acquired Kiromac Mfg. Co., Richmond, Ind. Both firms make metal-clad doors, fire doors, door frames, skylights, ventilators and similar architectural sheet metal products.

L. W. Brant Foundry & Sheet Metal Works, Danville, Ill., has dissolved partnership, with L. W. Brant retiring after being identified with the firm 46 years. The business is now managed by the fourth generation.

American Committee, International Chamber of Commerce, will meet in New York, June 14, to prepare for the expected prompt revival of foreign trade.

Remington Rand Inc., Buffalo, has compiled "Management Controller No. 709" devoted to case histories of records used by many corporations in handling problems of employee seniority.

Instrument Society of America has been organized to advance the arts and sciences connected with the theory, design, manufacture, and use of instru-

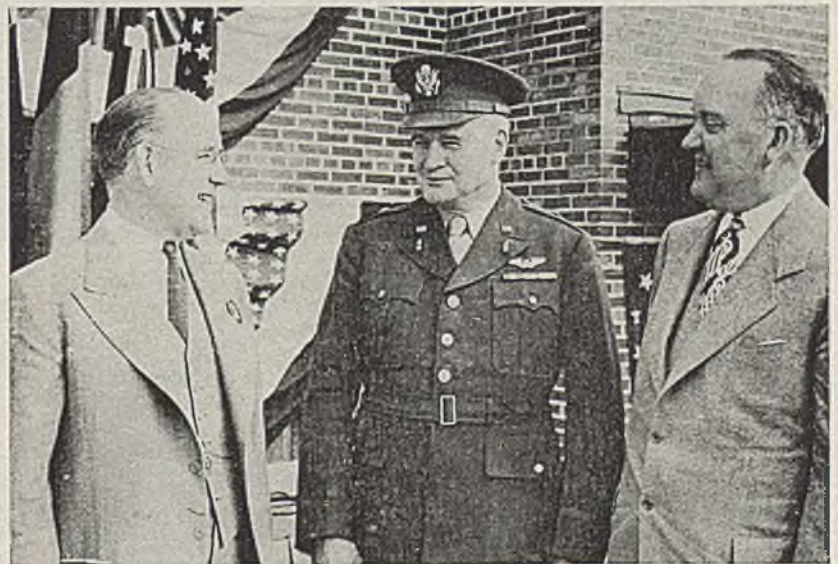
ments. The society's temporary office is located at 1117 Wolfendale street, Pittsburgh 12.

Purchasing Agents' National Group Elects New President

Charles L. Sheldon, purchasing agent, Hood Rubber Co., a division of B. F. Goodrich Co., Watertown, Mass., has been elected president of the National Association of Purchasing Agents for 1945-1946. He succeeds Robert C. Swanton, purchasing agent, Winchester Repeating Arms Co., New Haven, Conn.

Mr. Sheldon is consultant in the Office of Rubber Director of the War Production Board. From October, 1941, to April, 1943, he was loaned by his company to the Containers Division of WPB. Much of that time he directed that division.

Serving with Mr. Sheldon as members of the new executive committee of NAPA will be Mr. Swanton, the past president, and the following nine district vice presidents: George W. Aljian, California & Hawaiian Sugar Refining Corp. Ltd., San Francisco; O. D. Story, Shell Oil Co. Inc., Houston, Tex.; Roy F. Stiles, Stewart-Warner Corp., Chicago; Leslie E. J. Stonehouse, Westover-Kamm Co., Bay City, Mich.; William J. Mackay, A. F. Byers Construction Co. Ltd., Montreal, Canada; William F. Avery, Elwell-Parker Electric Co., Cleveland; W. S. Flinn, Simplicity System Co., Chattanooga, Tenn.; A. W. Zackey, Manganese Steel Forge Co., Philadelphia; and Everett A. Taylor, Providence Gas Co., Providence, R. I.



SIX MILLION ROUNDS: Brig. Gen. James Kirk, chief of the Small Arms Division of the Ordnance Department, presents John M. Olin, left, president of the United States Cartridge Co., St. Louis, and Spencer T. Olin, first vice president of the company, with the Army and Navy "E". Company has produced more than 6 million rounds of small arms ammunition

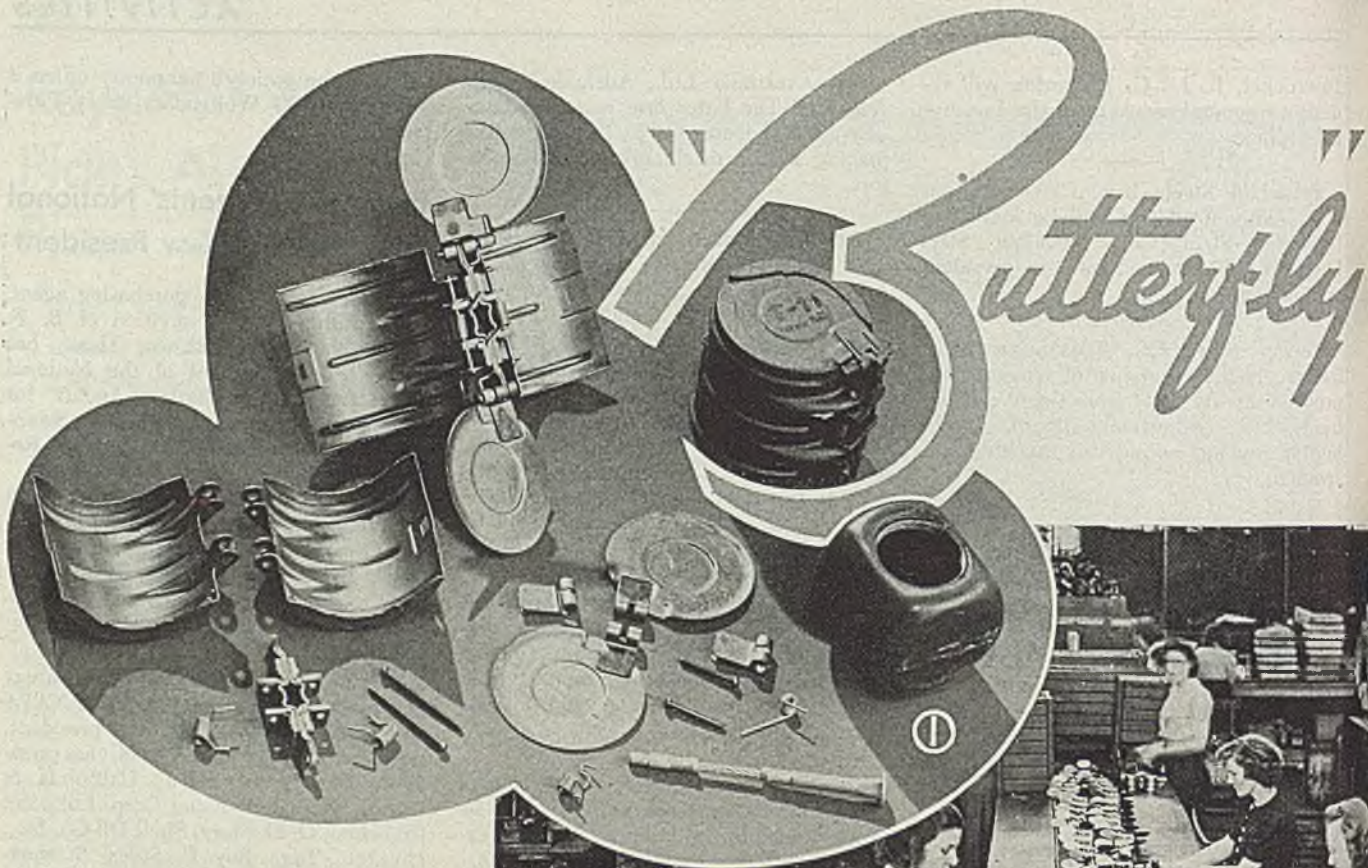


Fig. 1—Extreme right, bomb which is filled with explosive; upper right, bomb in case; upper left, open case, note springs and angle of "wings"; foreground, parts making up the assembly



Fig. 2—Assembly line starts at rear; finishes in foreground where operators are locking hinge pins by flattening ends in revamped wire cutters. Parts travel down line on belt conveyor in center of table



Fig. 3—Operator inserting preloaded spring in assembly. Circle shows closeup of head of tool employed to "wind up" and insert spring in assembly under tension desired

Fig. 4—Wings are added at these two stations. Actuating springs are also preloaded here by same method as in Fig. 3. Belt conveyor moves parts along assembly line

Case

Ingenious jigs and fixtures are devised at Geometric Stamping Co., Cleveland, to facilitate assembly operations in production of unique bomb containers; springs are preloaded before assembly

By G. W. BIRDSALL
Associate Editor, STEEL

MANY contributions have been made to the war effort by sheet steel stampings because they are so easily produced in huge quantities. Perhaps one of the most interesting sheet metal assemblies used in bombs is found in the "butterfly" case for the 4-lb. fragmentation bomb.

This case derives its "butterfly" name from the fact that when the individual bombs are released by bursting of the large case in which a quantity of them are dropped from a plane, the individual containers fly open to cause the bombs to flutter down in a fairly slow descent. The purpose is to allow air currents to disperse the bombs over as large an area as possible, thus exerting maximum

effectiveness against personnel when they explode.

Main cylindrical cover is split into two sections which are held open by strong springs. The two end pieces or wings also are hinged to the common "backbone" and held open by two more springs. As the case opens, the thick walled cast iron bomb itself is suspended from a short cable. The covers are seen at lower left, Fig. 1; the backbone at extreme lower left; the end pieces or "wings" in center foreground, with the suspension cable at right foreground. Completely assembled case is at upper left, with a closed case at the upper right. At extreme right is the thick-walled cast-iron bomb itself which is filled with explosive and fitted with a fuse to explode within the target area.

Improvements in the original design of the elements of this case have permitted considerable economies in production. For example, the two end pieces or wings were originally made separate from the hinges which were later spot welded to the wings. Now the wing and hinge is made in one piece.

Eliminate Four Stampings

The backbone originally was made from six stampings riveted together. Now this part is made from two stampings fastened together in a simple press operation. The two sections of the cover, the two wings and the backbone are made by blanking and forming 16-gage sheet steel.

Fig. 2 shows main portion of a 60-ft. table served by a 12-in. wide canvas conveyor belt, on which the assembly and inspection operations are conducted. The belt is driven by a ¾-hp. motor at various speeds. Rate of travel for this assembly job is about 8 ft. per minute.

At start of the line, extreme rear, Fig. 2, the stamped parts are fed from bins to convenient pickup points where the girls begin the assembly. First operation on this fragmentation bomb container is to assemble the cover sections to the backbone.

Fig. 3 shows closeup of this operation. The two sections of the cover are first positioned in the fixture, then the backbone is put in place. Now comes a



tricky little operation: The springs that hold the cover open are preloaded before assembly. This is done by use of the three pins at the lower left in Fig. 3 and the special loading tool shown in the circle, Fig. 3A.

The spring is placed over the pins in such a way that the loading tool can be hooked over the spring with one end of the spring anchored in the pins and then the tool is turned to load the spring and the other end of the spring engaged by the tool. While thus held under tension, the spring is slipped off of the pins and positioned in the assembly.

As it is held in place, Fig. 3, the operator lays one of the hinge pins on the fixture and drives it through the assembly by pushing the handle extending at the right foreground. Now the operator twists the spring-holding tool to disengage the spring which then holds the cover section open under the desired tension.

Since the entire fixture is of the turntable type, the operator can quickly swing it around to repeat the complete

operation on the other cover section. From this fixture, operator places the assembly on the conveyor belt which carries it on to the next operation. For this first operation, just described, there are four duplicate stations, two on each side of the belt conveyor in the extreme rear of Fig. 2.

Wings Added Next

Second assembly operation, pictured in Fig. 4, consists in adding the wings. Here also four work stations are required, two on each side of the belt conveyor. Cover assemblies with and without the wings attached can be seen on the conveyor in Fig. 4. Turntable jigs are also provided for this assembly. The operator inserts two springs, then puts the wings in place, using two long rivets or hinge pins. Springs are preloaded in assembly using the same system described in attaching the cover sections.

Passing on to the third operation, a station on each side of the belt is employed to close the container, check the springs and insert a safety fastener. The

open assembly is placed on top of a jig which roughly resembles a hollow rectangular block. A rod which comes up from underneath the table engages the assembly and when actuated by a foot treadle pulls the assembly down into the fixture, closing the covers and wings. The assembly is pulled down and released twice to check operation of the springs.

When proper operation has thus been checked, the assembly is pulled down in the fixture and a U-shaped wire clip is inserted in the cover sections where they come together, locking the unit in the closed position. As shown in Fig. 5, the closed assemblies then are put back on the conveyor belt. These two stations are the last ones on the conveyor and can be seen in the foreground of Fig. 2.

Fourth Operation Swaging Pins

Fourth operation is the swaging or expanding of the ends of the four hinge pins. These pins are headed at one end before insertion into the assembly. To lock them in place, the other end is flattened out using revamped wire cutters fitted with small anvils at the jaw tips and mounted on a bench fixture so they can be actuated through a foot treadle. This arrangement, shown in Fig. 6, allows the operator to use both hands for positioning the work. There are two of these stations on opposite sides of the conveyor belt as shown in immediate foreground of Fig. 2.

Final operation is inspection before the containers go to the finishing department for painting.

All the jigs and fixtures for assembly, as well as inspection fixtures provided at two points along the conveyor, were designed and built by engineers of Geometric Stamping Co., Cleveland, O.

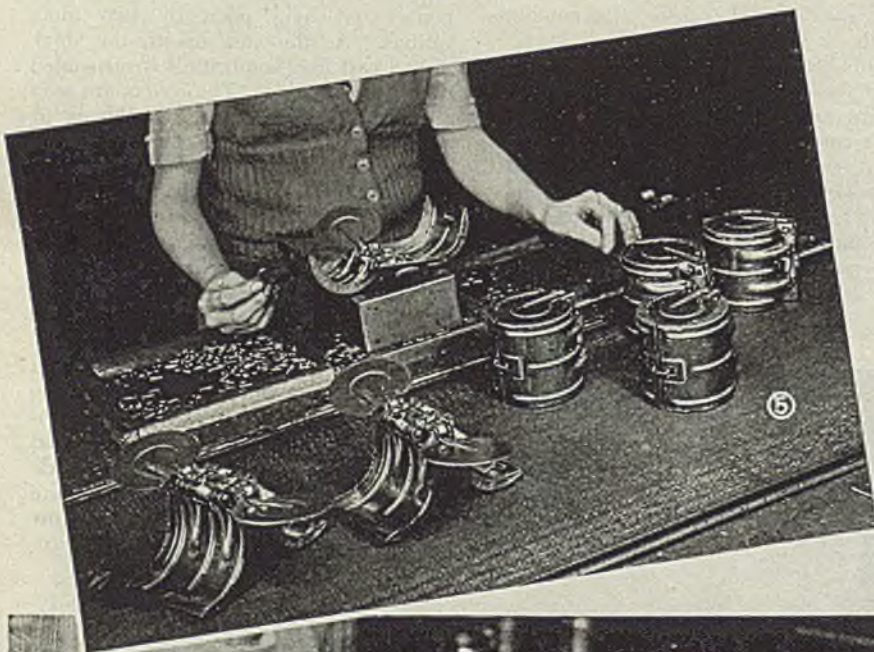


Fig. 5—In this fixture, operation of the spring actuated covers and wings is checked by pulling down into box-like fixture and the assembly locked in the closed position by inserting clips as shown

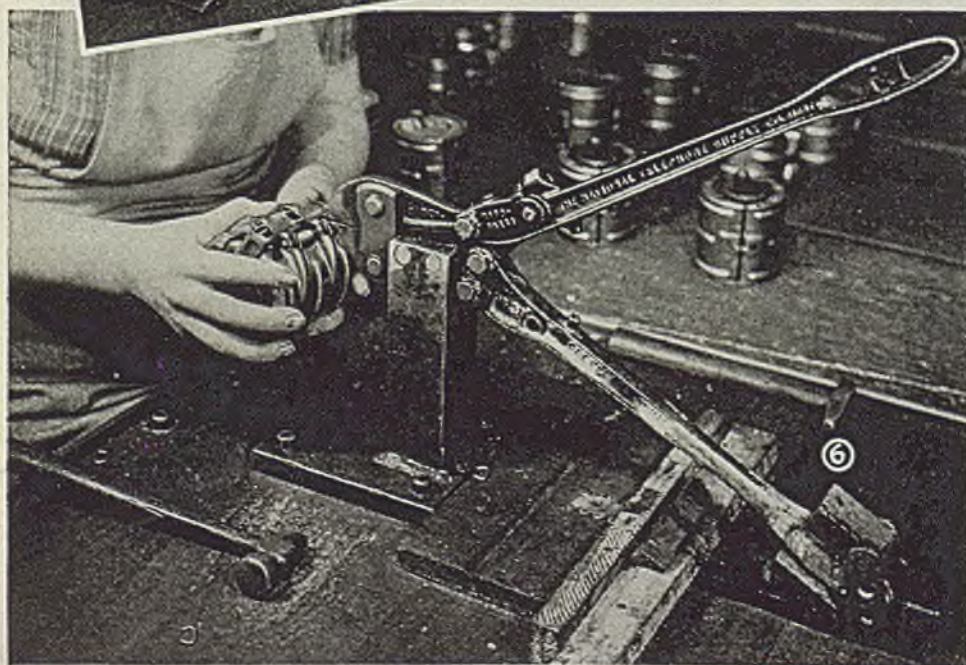
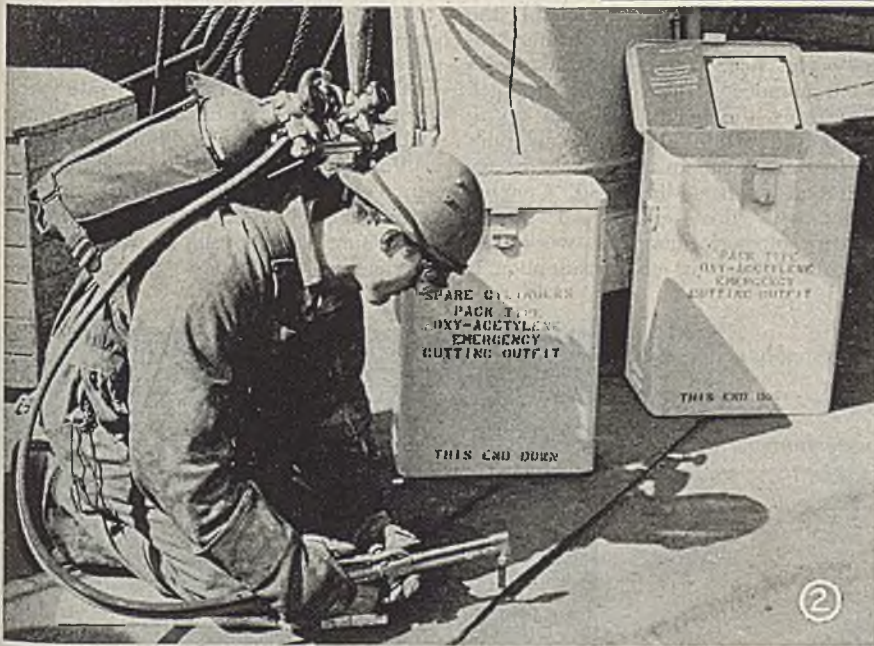


Fig. 6—Pins are locked in place by flattening ends in revamped wire cutters fitted with small anvils instead of cutting tips. All photos from Geometric Stamping Co., Cleveland

Back-Pack OXYACETYLENE CUTTING OUTFIT

... developed to speed repair of Navy's battle-damaged ships, may find many postwar industrial applications. Light weight of portable pack permits operator to carry it through narrow passages



In cases where battle-damage has caused the jamming of compartment doors, or where twisted steel wreckage needs cutting away prior to repair work, a single operator with his portable cutting gear can cut his way into damaged spaces, making way for fire hoses and repair parties. Men trapped in compartments have been rescued by immediate use of the new equipment, and fires that might have caused severe damage have been reached quickly.

Another advantage of the new cutting outfit, shown in position, Fig. 1, is the provision for rapid replacement of the gas cylinders when they become empty. This is accomplished by arranging cylinders in sets, a unit consisting of two oxygen cylinders and one acetylene cylinder. Each unit has its individual oxygen manifold already attached to the cylinder valve outlets and the cylinder set clamped in an aluminum cradle. This makes the set a unit and facilitates rapid change-over. When a change of cylinders is necessary, it is necessary to remove only the oxygen and acetylene regulators, take the empty cylinder set from the pack and replace it with a fully charged set. The two regulators then are re-attached, and the equipment is ready for use. Gas capacity of one set or unit of cylinders will cut approximately 225 lineal in. of 1-in. steel plate.

Probability that the new emergency cutting outfit will be used by relatively untrained operators under battle-damage (Please turn to Page 144)

OXYACETYLENE emergency cutting outfit recently developed for use under battle-damage conditions weighs only 56 lb and is contained in a fire resistant canvas back pack. It can be carried and operated by one man, permitting him to crawl through narrow passages, cutting his way, if necessary, as he goes. Improvement over earlier equipment, weighing almost 200 lb and requiring at least two crewmen to handle it, is obvious.

This pack-type emergency cutting outfit has proved so useful that similar portable equipment already is being made for municipal fire departments and it is expected that many industrial uses will be discovered for it in welding, as well as cutting.

After the North African invasion, some simplification in the design of oxyacety-

lene cutting equipment and increased portability was recommended to the Navy Bureau of Ships. A light, portable pack type outfit was developed, together with an aluminum locker to contain all of the apparatus, making it easy to remove from stowage and to prepare for operation.

The new pack type unit, of which there are 13,000 in service and on order, consists of two 22 cu ft capacity oxygen cylinders, one 10 cu ft capacity acetylene cylinder, gas regulators, a hand-cutting torch, hose, gloves, lighter, goggles, and tools. The two oxygen cylinders are connected by a manifold. Regulators are designed to control automatically the supply of gases to the cutting torch. All the operator must do before using the unit is open valves of the cylinders. The torch then is ready for action.

SELECTING Gas Immersion Tubes

Data on design and applications of immersion tubes suitable for industrial heating purposes worked out by the Committee on Industrial Gas Research of the American Gas Association are presented along with complete information on determining heat output and other considerations of thermal efficiency

BASIC performance characteristics of gas immersion tubes have been under investigation for the past two years by the American Gas Association at its Cleveland testing laboratories through its Committee on Industrial Gas Research.

This method of gas heating has been adapted to numerous commercial and industrial heating processes with considerable success. However, a lack of published technical data on this subject has hindered to some extent a more rational and convenient approach to engineering such applications for predetermined heating requirements, and for high standards of thermal efficiency and any other performance characteristics required.

During this investigation certain definite empirical relationships involving heat transfer characteristics of gas immersion tubes and their physical dimensions were developed. These data, which are applicable to immersion tubes suit-

able for industrial heating purposes will be discussed in some detail.

Large Gas Immersion Tubes

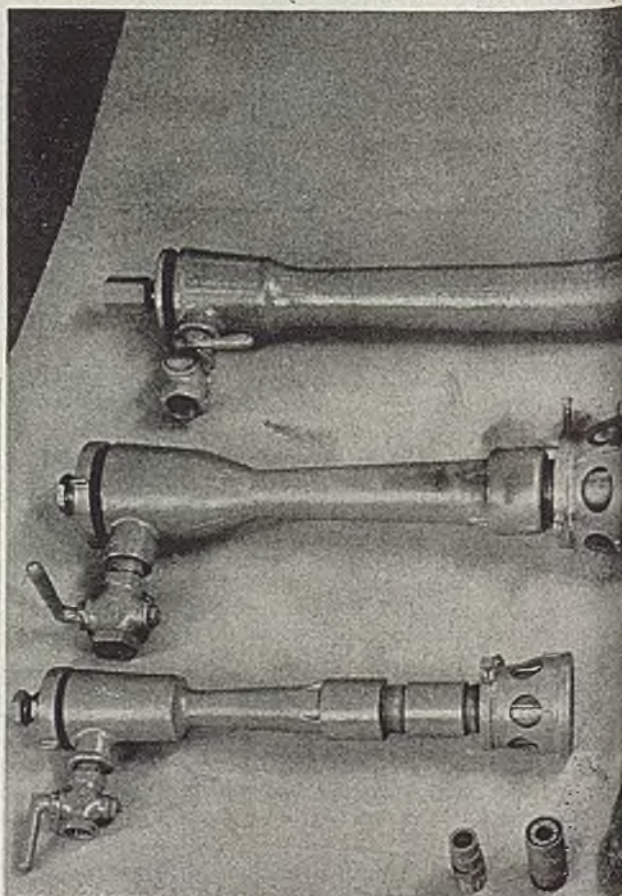
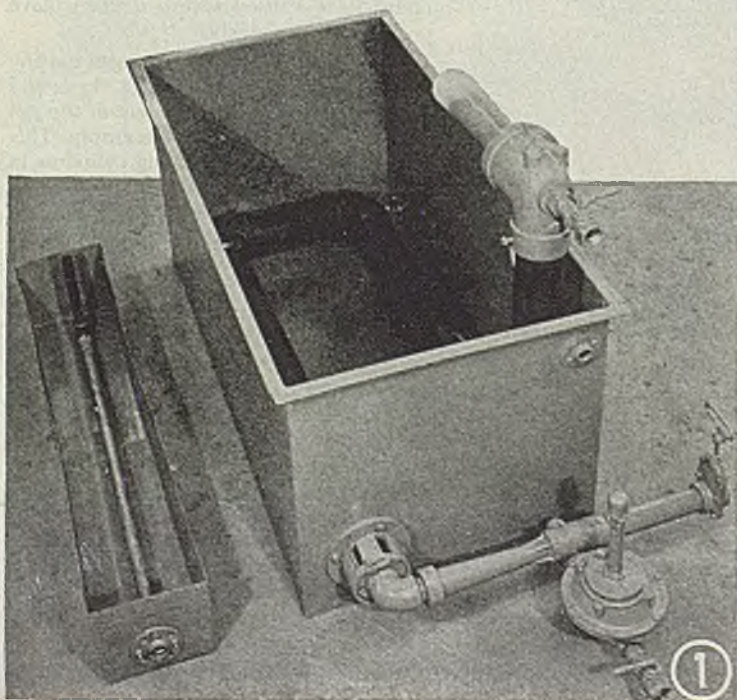
In any installation of industrial gas immersion tubes there are generally two primary design considerations which must be given appropriate attention. The more important of these is probably the requirement that the gas burning capacity and heat transfer characteristics of the immersion tube should be such as to bring the heated medium up to temperature within a desired time limit and to provide adequate pick-up or recuperation upon adding load. Coupled closely with this requirement is the necessity of performing the work economically insofar as gas consumption is

concerned. In other words, reasonably high heat transfer rates and thermal efficiency should be attained. Collateral considerations in the design and installation of industrial gas immersion tubes are that they should operate without excessive noise, that combustion should be complete, that the diameter of the tube should be adequate for the designed gas rate, and that the temperature and safety control equipment should function properly to insure safe performance and satisfactory recuperation under variable load conditions.

Fortunately, all capacity and thermal efficiency data obtained during this investigation could be closely correlated by a single relationship, involving only the length of the immersion tube (water-

Fig. 1—Open pressure burner and eductor assembly connected to U-shaped immersion tube

Fig. 2—Atmospheric and open type pressure burners, eductor and miscellaneous burner equipment used in these studies



backed) and the input rate. It may be expressed as:

$$E = 20 \log \left(\frac{L^2}{R} \right) \text{ plus } 71 \dots \dots (1)$$

Where:

- E = thermal efficiency, per cent
- L = effective length of tube, feet
- R = input rate, 1000 British thermal units per hour

The effective length L includes the straight length of pipe and 1.1 feet for each 90 degree elbow or return bend plus the length of the fitting at its centerline in feet. As will be noted, the diameter of the pipe can be neglected insofar as thermal efficiency is concerned.

On the basis of equation (1), recommended data in Table I were assembled. These are premised on the assumption that the immersion tube designer would have calculated the required hourly heat output from the tube or, as a corollary, the required hourly heat input into the medium being heated. Hence, length of immersion tube necessary for a predetermined heating requirement is given in Table I, and is related to efficiency of heat transfer expected and the appropriate gas input rate.

Recommendations presented in Table I have been verified for nominal tube diameters of 3/4 to 6 in. and effective lengths from about 4 1/2 to 45 ft. While there is reason to believe that extrapolation could be made to extend the applicability of this equation to larger tube sizes and longer tube lengths, this procedure is not recommended if close ac-

curacy is desired. However, if larger diameters or longer lengths than those employed in this research are required, equation (1) can be used to advantage in estimating probable tube dimensional requirements for specific heating rates. In no case should the data be extrapolated to cover shorter lengths of tubes than the shortest employed (4 1/2 ft).

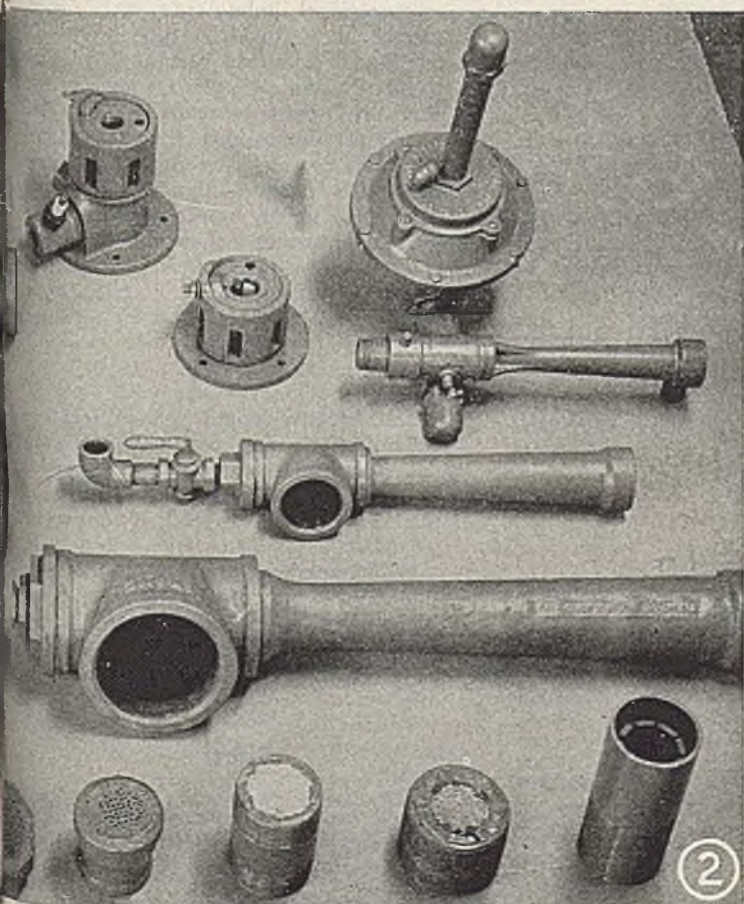
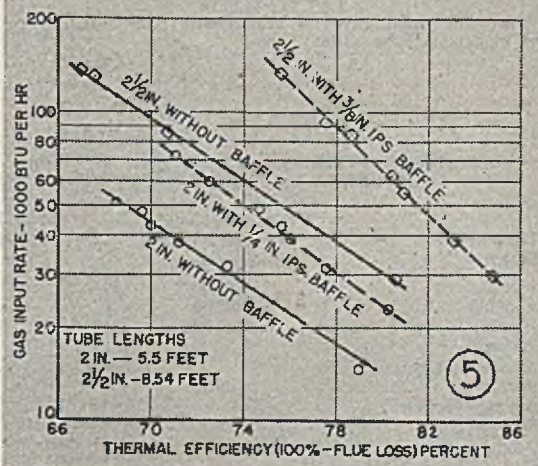
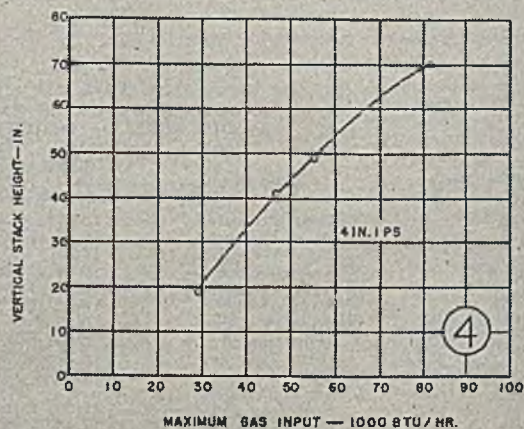
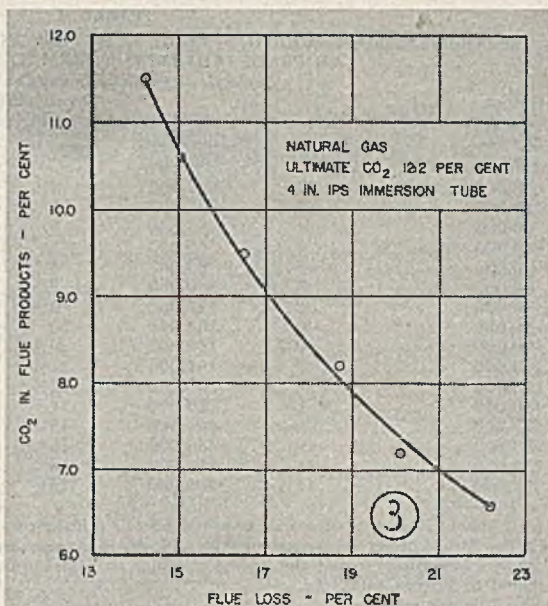
Maximum gas input rates which may be attained with satisfactory combustion in immersion tubes depends principally on type of burner installed. Several of the burners employed in this investigation are illustrated in Fig. 2.

When sufficient external energy is supplied with pressure or eductor burner systems, there is no reasonable limitation on the input rate per square inch of internal pipe surface area which can be reached. For this reason no attempt was made to evaluate quantitatively the various factors limiting gas input rates. However, a list of the maximum inputs employed in various tests is presented in Table II to provide a qualitative basis for estimating the range of input ratings that could be utilized with different type of burners. For open pressure type burners in 2 1/2 and 4-in. tubes, the in-

Fig. 3—Relation of flue loss in gas immersion tube heating to concentration of carbon dioxide in the flue gases

Fig. 4—Effect of stack height on maximum input obtainable with the atmospheric immersion tube burners

Fig. 5—Effect of baffles on thermal efficiencies of the 2 and 2 1/2-in. IPS immersion tubes



put rates tabulated approached closely the maximum that could be employed without excessive heat loss at the entrance of the tube.

The greatly increased input rating that can be attained by the use of a sealed-in type pressure burner is illustrated by the comparative ratings obtained in a 2-in. tube (279,000 versus 52,100 Btu per hour with the open type pressure burner). Likewise, the high rate with the pressure burner was obtained with an extremely long tube (over 40 ft); whereas, the 2-in. tube with which the input rate of 52,100 Btu per

hour was finally attained with the open type of pressure burner was only 5½ ft. long.

Similar increase in input rating also may be obtained by the use of eductors attached to the outlet of the immersion tube as shown in Fig. 1. The extent to which input rate may be increased depends on available air pressure and capacity and venturi size and design. An indication of the possibilities in this direction are revealed by data in Table II for 2.0 and 1.0 in. IPS. immersion tubes which were operated at relatively high inputs with a small vacuum. In

order to attain these high inputs with satisfactory combustion it was necessary to provide enlarged combustion chambers consisting of short lengths of 4-in. pipe for both pipe sizes.

Atmospheric burners were found to have lower limitations on maximum rates. In Table II it will be noted that the 2½ and 4-in. tubes capacities of atmospheric burners were less than half that obtained with open type pressure burners, and this was possible only in tubes of relatively short length and with use of 7-ft vertical risers to provide adequate draft. Influence of stack height is shown quantitatively for a 4-in. immersion tube in Fig. 3. It is interesting to note that an increase in height of vertical riser of from 20 to 70 in. permitted the maximum input rate consistent with good combustion to be increased from 30,000 to 80,000 Btu per hr.

TABLE I
RECOMMENDED IMMERSION TUBE LENGTHS* FOR REQUIRED OUTPUT RATES
AT PREDETERMINED THERMAL EFFICIENCIES

Output Rate Btu per Hr.	Effective Length of Immersion Tube Required at Predetermined Thermal Efficiency and Required Input Rate					
	Thermal Efficiency—F†					
	60%		70%		80%	
	Input Rate Btu/Hr.	Input Rate Btu/Hr.	Input Rate Btu/Hr.	Input Rate Btu/Hr.	Input Rate Btu/Hr.	Input Rate Btu/Hr.
10,000	2	17,000	3½	14,000	6	12,500
20,000	3	33,000	5	29,000	8½	25,000
30,000	4	50,000	6	43,000	10½	37,500
40,000	4	67,000	7	57,000	12	50,000
50,000	5	83,000	8	71,000	13½	62,500
60,000	5	100,000	8½	86,000	14½	75,000
70,000	6	117,000	9½	100,000	15½	87,500
80,000	6	133,000	10	114,000	17	100,000
90,000	6½	150,000	10½	129,000	18	112,500
100,000	7	167,000	11½	143,000	19	125,000
125,000	8	208,000	12½	179,000	21	156,250
150,000	8½	250,000	14	214,000	23	187,500
175,000	9	292,000	15	250,000	25	218,500
200,000	10	333,000	16	286,000	26½	250,000
250,000	11	417,000	18	357,000	30	312,500
300,000	11½	500,000	19½	429,000	32½	375,000

*Each 90 degree elbow or return bend is equivalent to 1.1 ft of straight pipe plus the length of the fitting at its centerline in feet. All effective pipe lengths are water-backed surfaces. Pipe lengths extending beyond the heated medium such as burner cages are not included and must be added to lengths tabulated.

†To nearest ½-ft.

TABLE II
MAXIMUM INPUT RATES EMPLOYED ON
VARIOUS SIZES OF IMMERSION TUBES

Pipe Diam. Nominal In.	Type of Burner	Length of Tube, Ft.	Maximum Input Btu/Hr	Flue Gas Temp. °F.	Burner Cage Temp. °F.
6	Open Pressure	15.0	311,000	995	190
5	Open Pressure	15.18	343,000	1,137	205
4	Open Pressure	14.7	191,000	886	336
4	Atmospheric*	6.41	82,300	1,060	
3	Open Pressure	10.58	150,500	988	151
3	Atmospheric*	10.62	57,600	749	
2-1/2	Open Pressure	9.82	136,400	1,068	322
2-1/2	Atmospheric*	5.92	51,300	1,093	
2	Open Pressure	5.5	52,100	1,011	119
2	Open Pressure	11.04	135,500	863	
	15 In. Vac.				
2	Sealed-In Pressure	42.77	279,000	201	101
1	Open Pressure	11.27	46,200	256	380
	1.33 In. Vac.				

*Maximum input rates for atmospheric type burners were obtained with 7 ft of vertical stack at immersion tube outlet.

TABLE III
COMPARISON OF HEAT OUTPUT AND THERMAL EFFICIENCY CHARACTERISTICS
OF 4 SIZES OF IMMERSION TUBES AT VARIOUS INPUT RATINGS

Tube Size In. I.P.S.	Gas Input Rate—Btu/Hr/Sq. Ft. of Internal Tube Surface		
	80% Efficiency	75% Efficiency	70% Efficiency
	400-500 F Flue Temperature	700-800 F Flue Temperature	900-1000 F Flue Temperature
2	4700	8500	15,000
2½	5200	8800	14,000
3	4500	8500	15,500
4	5000	8900	15,500
Average Input Btu/hr/sq ft	4850	8675	14,875
Average Output Btu/hr/sq ft	3880	6500	10,400

Riser Height May Be Adjusted

In this range of vertical riser or stack height the permissible increase in input rate per foot of stack height was 12,000 Btu per hr, maintaining the length of immersion tube at a constant value. This drastic effect of change in riser height on maximum permissible input rate prompts the observation that selection of required pipe diameter for a given input rate need not be rigorous since tube capacity can be readily and substantially increased if necessary by the simple expedient of appropriately adjusting riser height.

During this investigation gas rates at atmospheric pressures slightly in excess of 10,000 Btu per hr per square inch of cross-sectional tube area were completely burned with a tube length of 5.5 ft and a vertical riser of 7 ft. With a tube length of 10½ ft and vertical riser of 7 ft, approximately 7500 Btu per hr per square inch of cross-sectional area was completely consumed. It may be noted, however, that it should be possible to employ input rates per square inch of cross-sectional area with atmospheric burners that follow the relationship:

$$5000 \sqrt{\frac{10}{L}}$$

Where:

L = effective length of tube, feet

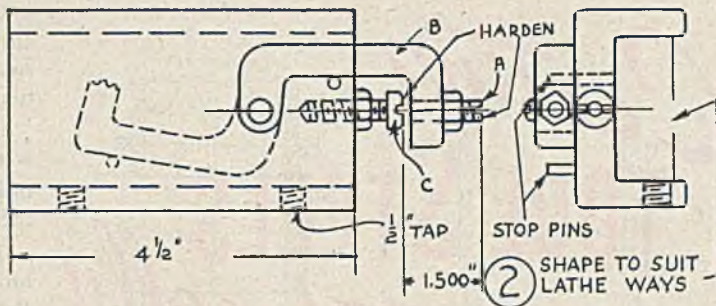
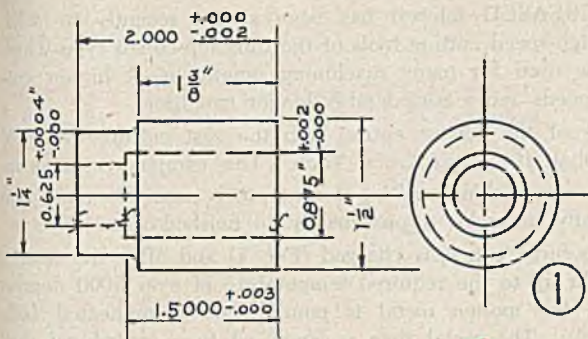
This relationship will give conservative values which can be safely exceeded in most instances, particularly if more than 7 ft of vertical stack is to be employed.

With open type pressure burners considerably higher, input rates per square inch of cross-sectional area can be employed. With this type of burner equipment, input rates following the relationship

$$15,000 \sqrt{\frac{10}{L}}$$

should be readily attainable with complete combustion. Higher rates may lead to excessive burner cage temperatures

(Please turn to Page 146)



Lathe

By ROBERT MAWSON
Providence, R. I.

ATTACHMENTS

... transform special machining job into production operation, thus permitting work formerly requiring highly skilled operators to be handled on simple repetitive basis

MANY small machine shops have found it necessary during the war to transform special machining jobs into production operations, because work formerly done by experienced machinists has to be performed by girls. A striking example of how this need of skilled help is being hurdled was demonstrated in a small shop visited recently. This plant had received an order to machine several thousand small bronze castings. A detail of this piece is shown in Fig. 1.

In order to meet the quoted price and to comply with the manufacturing requirements, this job is being done by a girl with the aid of special equipment to be described.

A pair of chuck jaws was machined to hold the 1 1/2-in. diameter piece, these jaws being made with a 1/4-in. projecting surface on their lower or inside end. The first set of operations, with the piece held in these chuck jaws, consists of facing the left end surface and boring the 0.625-in. hole. This hole is tested with a standard go and no-go plug gage.

In the second operation, position stops are used. For this work the casting again is placed in the same chuck jaws, but this time the piece is located for position against the projecting surfaces previously mentioned.

Referring to details in Fig. 1, it will be noticed that the important dimensions to be obtained in this second operation are the overall length, 0.875-in. deep hole, and the diameter of this hole. In order to obtain a low manufacturing cost, several attachments were made.

The attachment shown in Fig. 2 is fastened to the ways of the lathe at the rear of the chuck. The screw, A, then is adjusted so that, with the machining

tool in the tool post and the left hand edge of the lathe carriage coming against this screw, the piece will be machined to length of 2 in.

The attachment shown in Fig. 3 is fastened to the lathe carriage in front of the cross slide, screws being provided to hold the attachments in position, as may be seen in illustration.

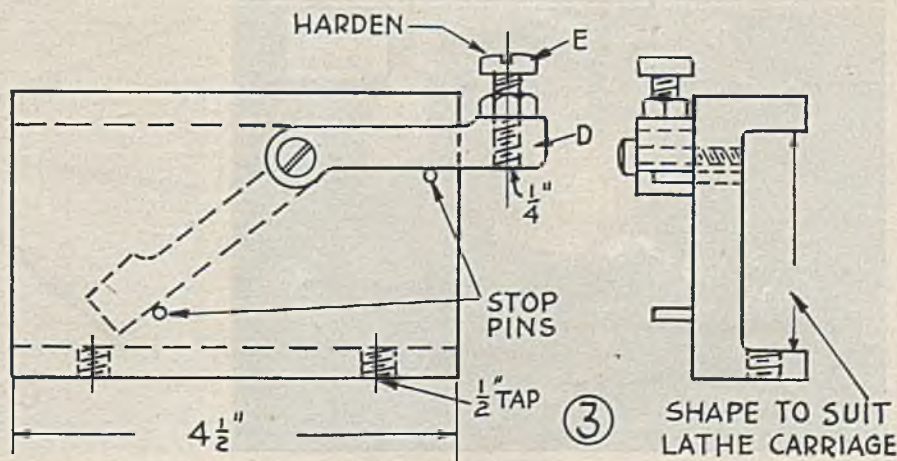
However, when facing the casting to length, the arm D on the attachment in Fig. 3 is swung back to the position by the dotted lines. When boring the 0.875-in. hole, the arm B on the attachment in Fig. 2 is swung back to the position shown by the dotted lines and the depth or position stop is the end of the screw C, this stop having been set so that the 1.5-in. depth will be obtained. The arm D on the attachment in Fig. 3 also is swung to the position shown by the full lines and the position stop E set so that the machining tool will bore the hole to the proper diameter.

After these position stops are set and

locked by means of their respective nuts, the operator rapidly can repeat the machining operations and obtain each time the desired dimensions. The only time it is necessary to adjust the settings is when the facing and boring tool needs regrinding. Such adjustments are made quickly.

Obviously, the design of these attachments must be made to conform to the particular type of lathe on which operations are to be performed. However, the basic principles can be applied successfully in connection with many machine tools.

With these attachments, an inexperienced operator can throw the arms to their proper positions and machine the piece quickly and easily. Thus, what with standard equipment would be a conventional machining job demanding a high grade operator, becomes a simple repetitive "mass production" operation through this application of tool engineering technique.



Casting TOOL STEELS Centrifugally

INCREASED interest has been shown recently in solid, cast high-speed cutting tools of the tungsten-cobalt type which can be used for many machining operations at higher cutting speeds and a considerably longer tool life.

One of the newest entries into the cast cutting tool field is Crobalt Inc., Ann Arbor, Mich. This company uses an indirect arc, rocking melting furnace and casts the tools centrifugally in molds approximately to finished size.

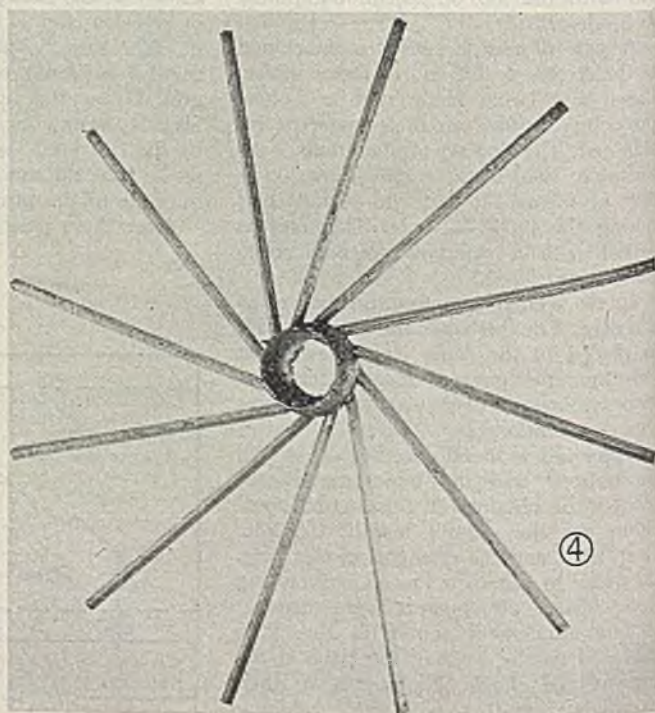
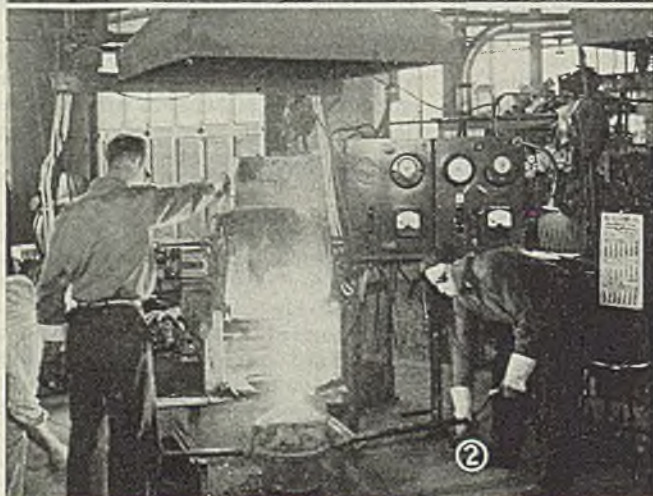
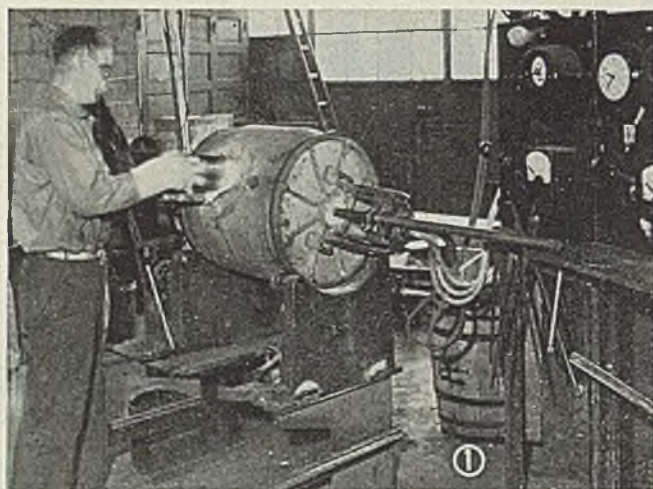
The furnace first is charged (Fig. 1) and after the heat is brought up to the required temperature of over 3000 degrees Fahr., the molten metal is poured into a preheated ladle (Fig. 2). The metal then is conveyed to a centrifugal casting machine (Fig. 3) and poured at a temperature of about 3000 degrees Fahr.

As will be noted by referring to Fig. 4, a dozen individual cutting tools are cast around the central pouring sprue. When the metal has cooled, the castings are removed from the hub and cut to proper length. Next, the tools in the rough are heated for one hour in an instrument-controlled electric furnace at a temperature of between 1000 and 1100 degrees Fahr. and quenched in oil. This same heat-treating procedure then is repeated.

Heat treatment increases hardness from approximately 63 rockwell C to between 66 and 70. Hardness is controlled so that tools can be produced with the desired characteristics for individual applications.

Following heat treatment, the castings are ground to finished size for use as standard tools or inserts in large, composite tools. The composition of these tools, designated as Powersteel, is 19.46 per cent tungsten, 3.86 chromium, 1.19 vanadium, 1.12 molybdenum, 10.08 cobalt, and balance iron. The process, which is covered by Patent No. 2195402, is said to give the metal a preferred grain and carbide particle size at the time of casting, thus eliminating forging and subsequent heat treatment.

According to Charles Baird, vice president in charge of development and product, the tools will retain their cutting ability on many types of work several times longer than previously had been considered possible, and cutting speeds can safely be increased by 20 per cent. These tools, however, are not regarded as being a cure-all for every kind of cutting job.



CAST *and* FORGED

STEELS

Compared

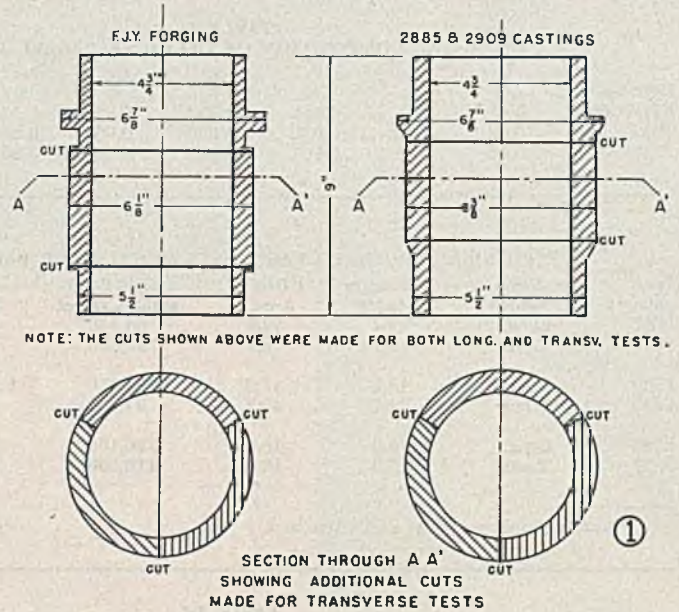


Fig. 1—Sketch of cylinder barrels

After making comparative study of physical properties of the two materials, Battelle Memorial Institute researchers conclude there is little to choose between forged and soundly cast steel parts. Limited forging of cast blanks sometimes effective

By C. E. SIMS

Battelle Memorial Institute
Columbus, O.

Memorial Institute to do research work, fundamental testing, and development of test methods. This work was under the direct supervision of the War Metallurgy Committee and under the general guidance of a committee composed of metallurgists versed in steel casting and of individuals with a knowledge of aircraft requirements. This article is based on excerpts from the restricted Battelle report, serial No. W-154.

Forged and Cast Cylinder Barrels Compared: Early in the project, a request was made to compare the properties of forged and centrifugally cast aircraft engine cylinder barrels, especially in fatigue. Centrifugally cast barrels

from two heats of steel and forged barrels from one heat of steel were procured in the rough machined condition. The compositions of the three heats are given in Table I.

All cylinders were heat treated according to current practice which consisted of quenching in oil from 1550° F and tempering back to a hardness of approximately 325 brinell. The barrels were then sectioned longitudinally and transversely as shown in Fig. 1 to obtain tensile and fatigue bars. Tensile bars were standard .0505-in. bars with threaded grips, while the fatigue bars were of the rotating beam type for the R. R. Moore machine. Both the smooth bar, with 9/4-in. radius, and the Kommers square-notch fatigue bars were used.

The tensile bars were broken on standard hydraulic machines, while the fatigue bars were tested in R. R. Moore rotating beam machines running at 10,000 rpm. Data on the tensile tests are given in Table II, while the data from the fatigue

BEFORE aircraft were put into mass production, many steel parts were hogged out from solid steel stock. With the advent of mass production and assembly lines, these parts were redesigned, so far as possible, to be made as drop forgings, machine forgings, or hammer forgings. Many assemblies such as landing-gear parts were made by welding forgings together, forgings to tubing, etc. Such assemblies have been satisfactory in respect to service obtained.

Because of the tremendous wartime demand for forgings, however, there developed a shortage in forging-quality alloy steel, in forging machine capacity, in die block steel, and in tool makers. As a result, forgings were extremely hard to procure in a reasonable time, especially when changes in design required new die blocks. Some parts, moreover, were of such size and shape as to require complicated and expensive dies. Expense here is interpreted as manhours of labor rather than dollars.

One potential source of parts, and a means to break the bottleneck, was to substitute steel castings for forgings. The aircraft industry, on the whole, has had but little experience with steel castings, and the comparative properties of the two products were largely unknown. Individual aircraft manufacturers were taking steps independently to procure test castings, but, inasmuch as the problem is common to all producers, the subject was taken up with the War Production Board.

WPB placed a contract with Battelle

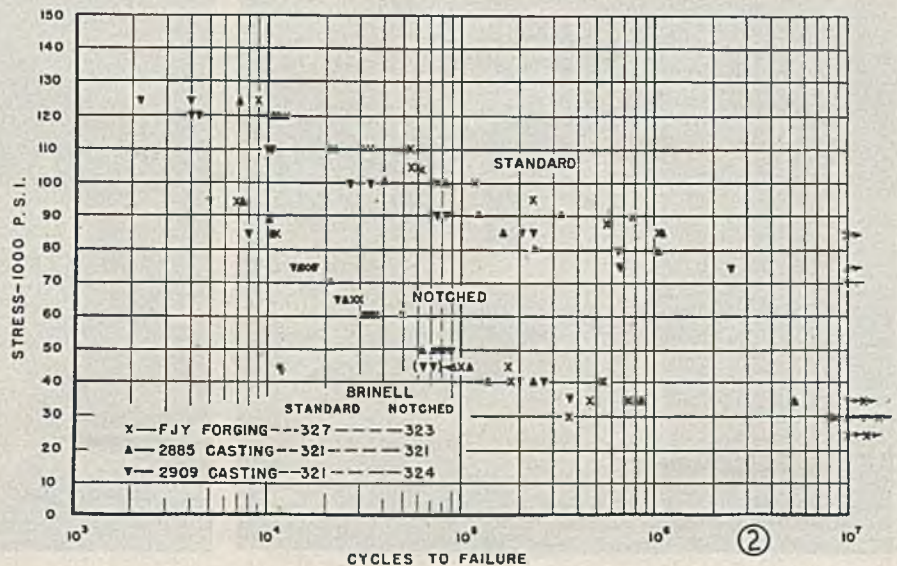


Fig. 2—S-N curves, standard and notched bars from forgings and castings, longitudinal

TABLE I
CHEMICAL COMPOSITION OF CYLINDER BARREL HEATS

Heat No.	C. %	Mn. %	P. %	S. %	Cr. %	Mo. %	Si. %	Remarks
FJY-SC503	0.41	0.74	0.015	0.037	0.89	0.20	0.20	Forging
2909	0.42	0.74	0.030	0.030	0.93	0.18	0.41	Casting
2885	0.45	0.86	0.027	0.042	1.06	0.20	0.47	Casting

TABLE II
PHYSICAL PROPERTIES OF TESTS IN CYLINDER BARRELS*

Specimen	Orientation	Elong. in 2 in., %	Red. of Area, %	Yield Point at 0.2% Offset	Ultimate Strength	Brinell Hardness
FJY	Long.	13.4	59.2	88,150	136,650	323
FJY	Trans.	11.7	38.2	106,800	141,770	323
2909	Long.	13.2	47.6	95,250	138,350	324
2909	Trans.	11.7	47.2	94,300	137,700	324
2885	Long.	13.3	46.6	126,100	156,300	321
2885	Trans.	13.3	48.8	116,500	153,400	321

*Results shown are from single test bars.

TABLE III
CHEMICAL COMPOSITION OF EXPERIMENTAL HEATS

Heat No.	% C	% Mn	% Si	% Cr	% Mo
9349	0.36	0.44	0.38	0.97	0.28
9413	0.42	0.91	0.34	1.00	0.33
9467	0.24	0.69	0.22	0.96	0.21
9650	0.37	0.69	0.36	1.02	0.25

TABLE IV
AVERAGE MECHANICAL PROPERTIES

Condition	Bhn.	Tensile, p.s.i.	Elong. in 2 in., %	Red. of Area, %	Charpy, Ft.-Lbs.
Cast unsoft	320	122,800	1.5	5.7	12.5
Cast soft	313	145,100	12.5	36.6	16.5
Cast unsoft forged	316	149,200	10.5	28.2	18.3
Cast soft forged	320	152,900	15.5	48.7	22.5

TABLE V
HEATS CAST INTO FORGING BLANKS

Heat No.	C	Mn	Si	Cr	Mo
0	0.33	0.45	0.22	0.98	0.27
1	0.33	0.93	0.34	1.02	0.31
2	0.33	0.88	0.33	1.04	0.25
4	0.35	1.32	0.28	1.03	0.25

tests are plotted here in Figs. 2 and 5.

Discussion of Data: In the tension data of Table II, the higher composition of Heat 2885 will account for its slightly higher strength. In comparing the forgings with castings of Heat 2909, which are very similar in composition, it is interesting to note that although the forgings show somewhat better longitudinal properties, they are inferior in the transverse test. The average of both directions for the forging is the same as for the casting. The principal difference, therefore, is that the forging has directional properties which are absent in the castings.

Fatigue tests were run to exhaustion of available stock, but it is apparent that more data in the lower stresses would have been helpful. In interpreting these data, no general conclusions can be drawn. Only indications can be observed in data of forgings from one heat and castings from two heats.

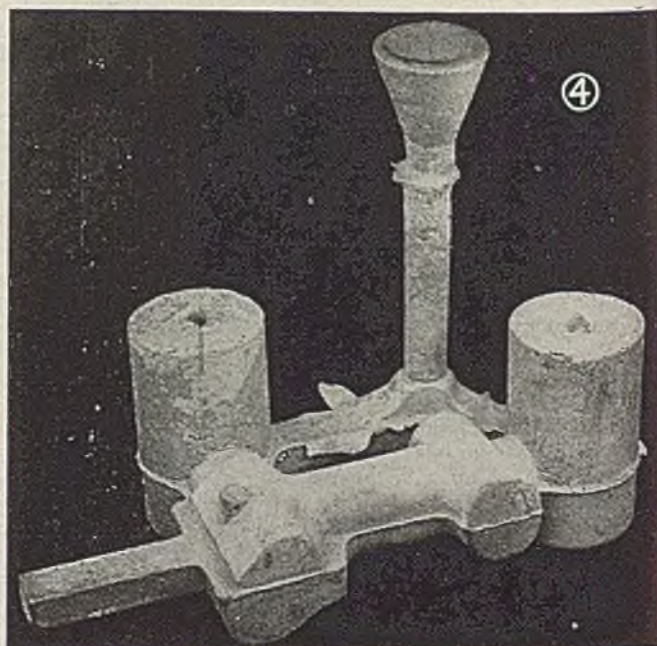
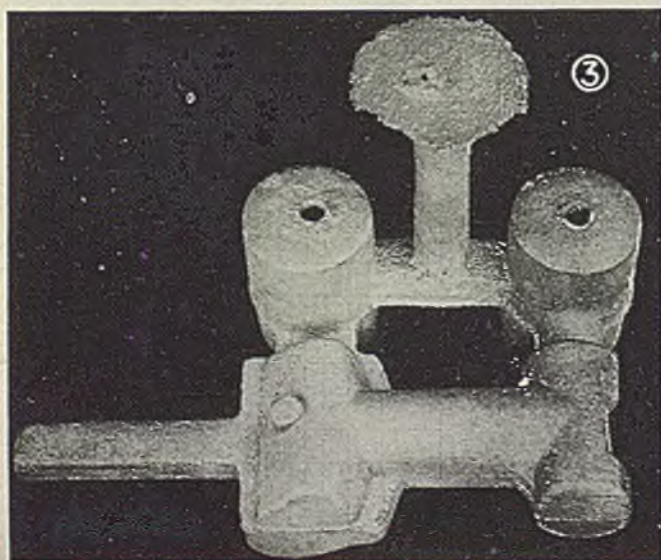
Considering the width of the scatter band as an indication of integrity and reliability in the steel, it will be observed that, for all steels, they are very narrow, and that there is little to choose between the steels in this respect. In the notched bar tests, the scatter bands are even narrower, which may be taken to indicate that the notch itself is more important than minor differences in the steels.

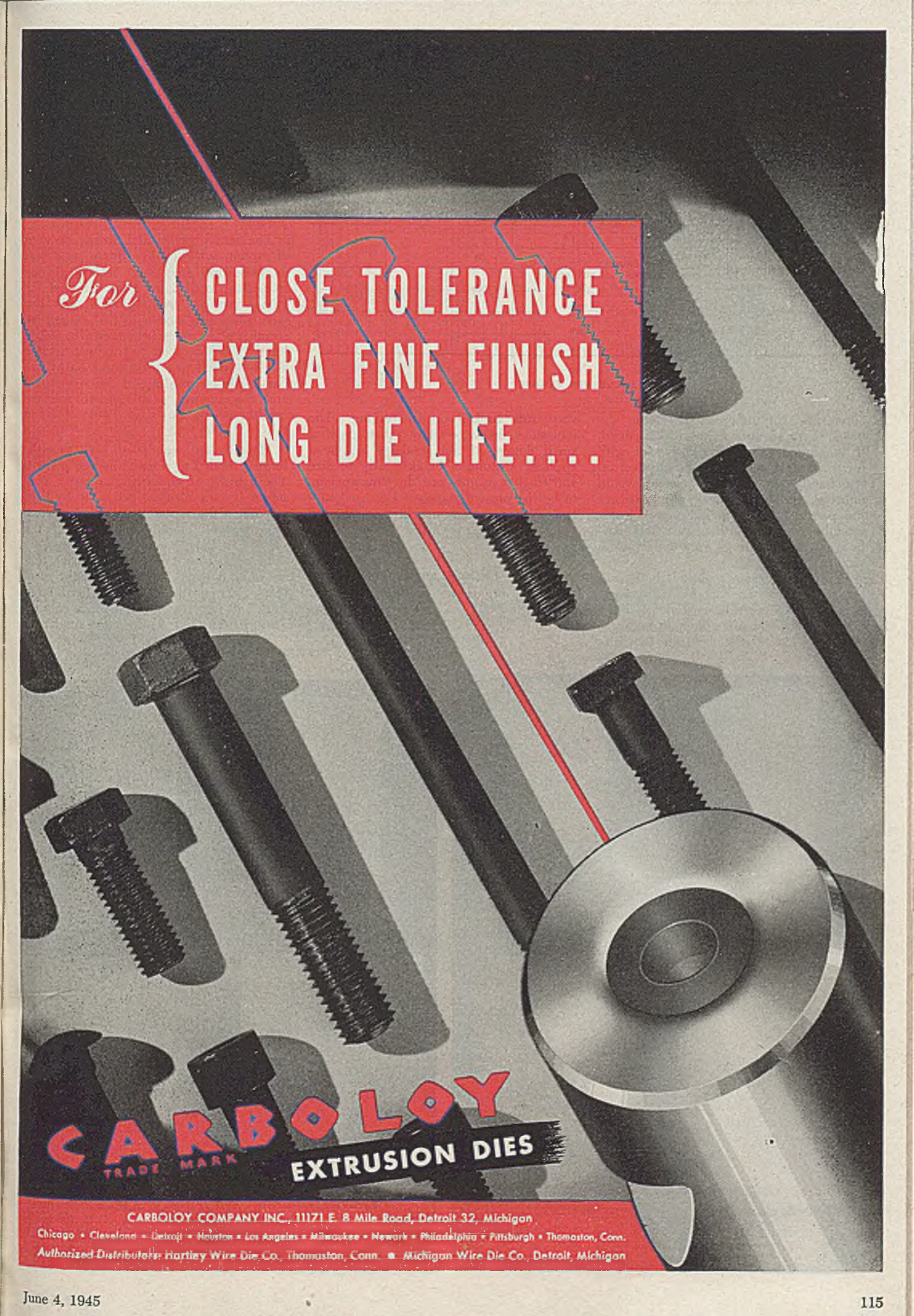
Although endurance limits were not definitely established, they are indicated roughly by the S-N curves. Again, as in the tensile tests, the forgings seem to have a slight advantage in the longitudinal tests which is lost in the transverse tests. All in all, however, the results are so closely similar that, so far as these tests are concerned, no superiority can be shown for either the forged or the cast steel.

Cast Forging Blanks: One method that has been proposed to relieve the strain on forging facilities is to cast forging blanks that will approximate, in shape and size, the rough forging before it

Fig. 3—The method of casting the forging blank

Fig. 4—Improved method of casting forging blank



The background of the advertisement is a dark, textured surface with several black bolts of various sizes and types scattered across it. A prominent feature is a large, cylindrical die with a central hole, positioned in the lower right quadrant. A red line, resembling a laser or a pointer, originates from the top left and points towards the die. The overall aesthetic is industrial and technical.

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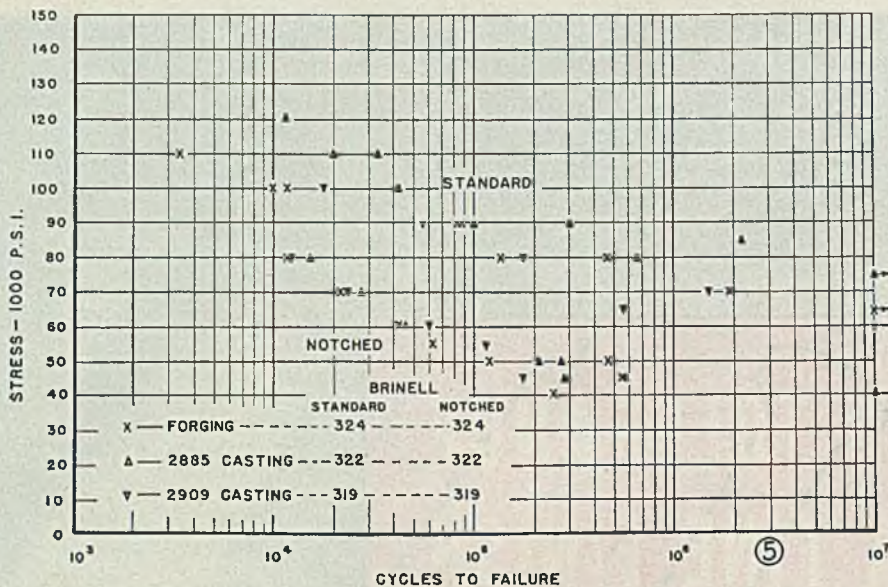


Fig. 5—Forgings vs. castings, transverse stress

normally so made have been found in which the cast blank was machined to size and not forged at all. With the expectation, later verified, that such a process would show increased output per hammer, it was decided to make a short study on the technical aspects, particularly in regard to the properties of the products.

The first experimental work consisted of casting some 1¼-in. square steel bars in SAE 4100 steel with carbon ranging from 0.24 to 0.42 per cent. Half of the bars were cast sound, while the rest were purposely cast with bad center-line shrinkage. Part of these were forged lightly, and then all were heat treated and machined to tensile and Charpy test bars. The composition of the steels used and the average properties for all the conditions are shown in Tables III and IV.

Macroetched sections showed that the forging tended to close shrinkage cavities. These tests, as conducted, show a considerable improvement produced by light forging in the unsound bars and a lesser improvement in the properties of the sound cast bars.

In order to obtain comprehensive test, an aircraft part from a wrought steel blank was borrowed from a local forge shop and used as a model for a pattern. The pattern was made very similar to (Please turn to Page 152)

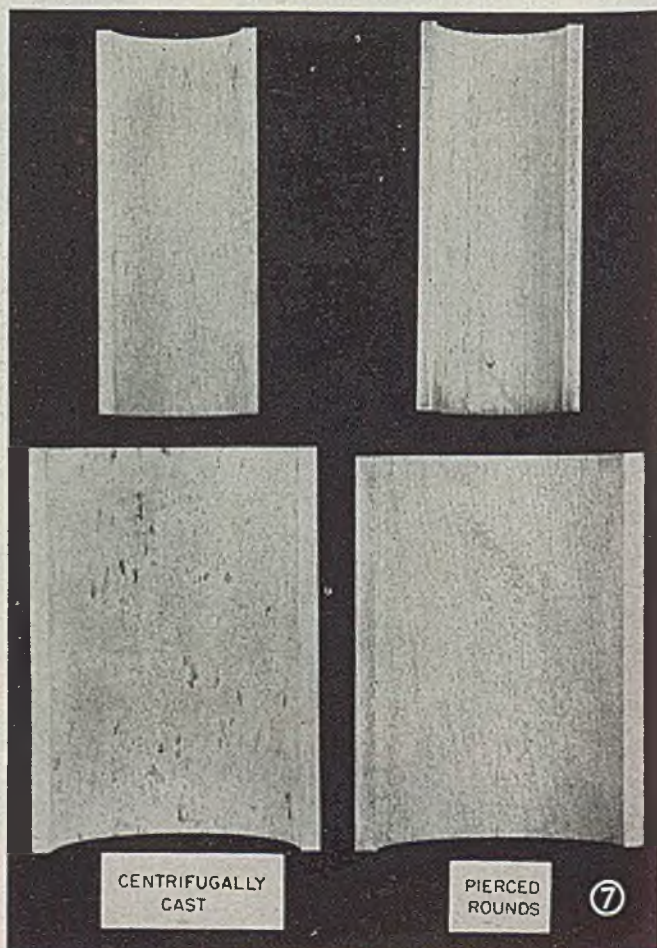
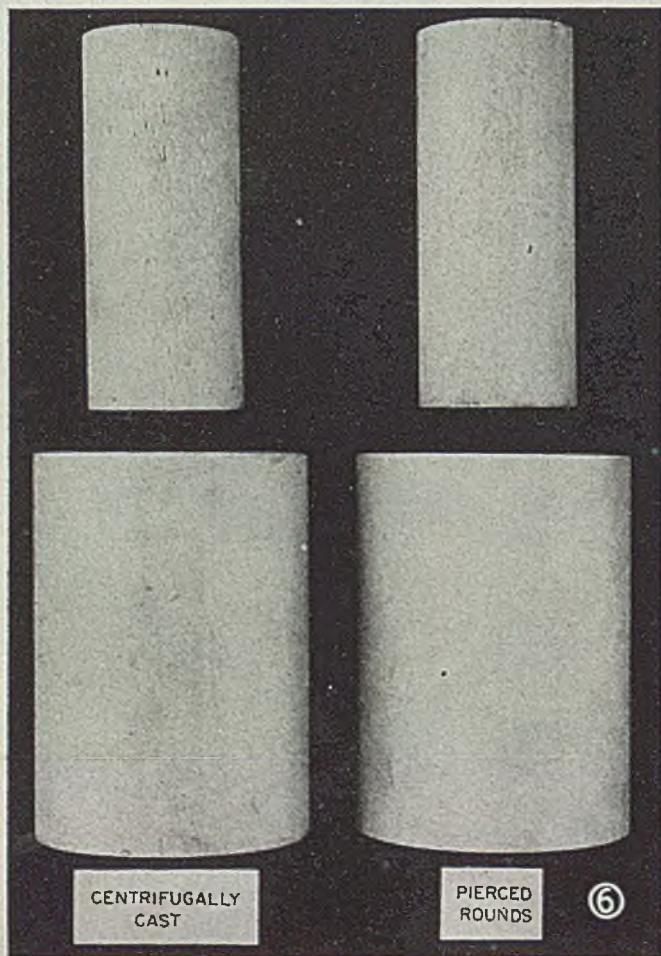
enters the last impression of the die block. Two advantages would be gained, it is argued. Smaller die blocks with fewer impressions would be needed on one hand, and the hot working would improve the mechanical properties of the part so that it would more closely resemble forged steel than cast steel, particularly if the castings were not sound in the first place.

Captured German material, both ordnance and aircraft, contains many forgings from alloy steels, customarily high in chromium and often high in manganese, that show a cast dendritic structure

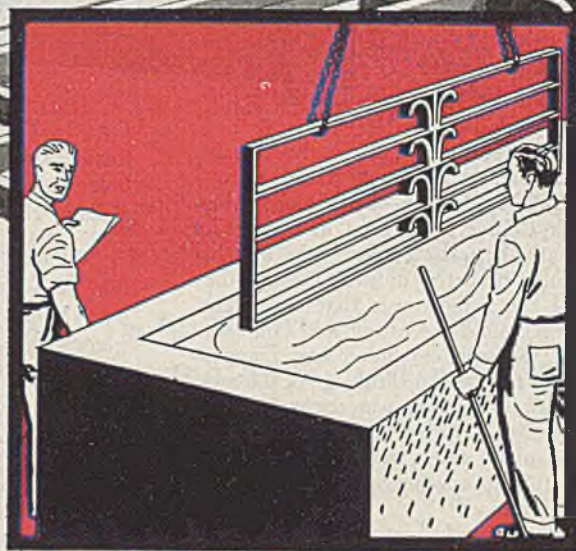
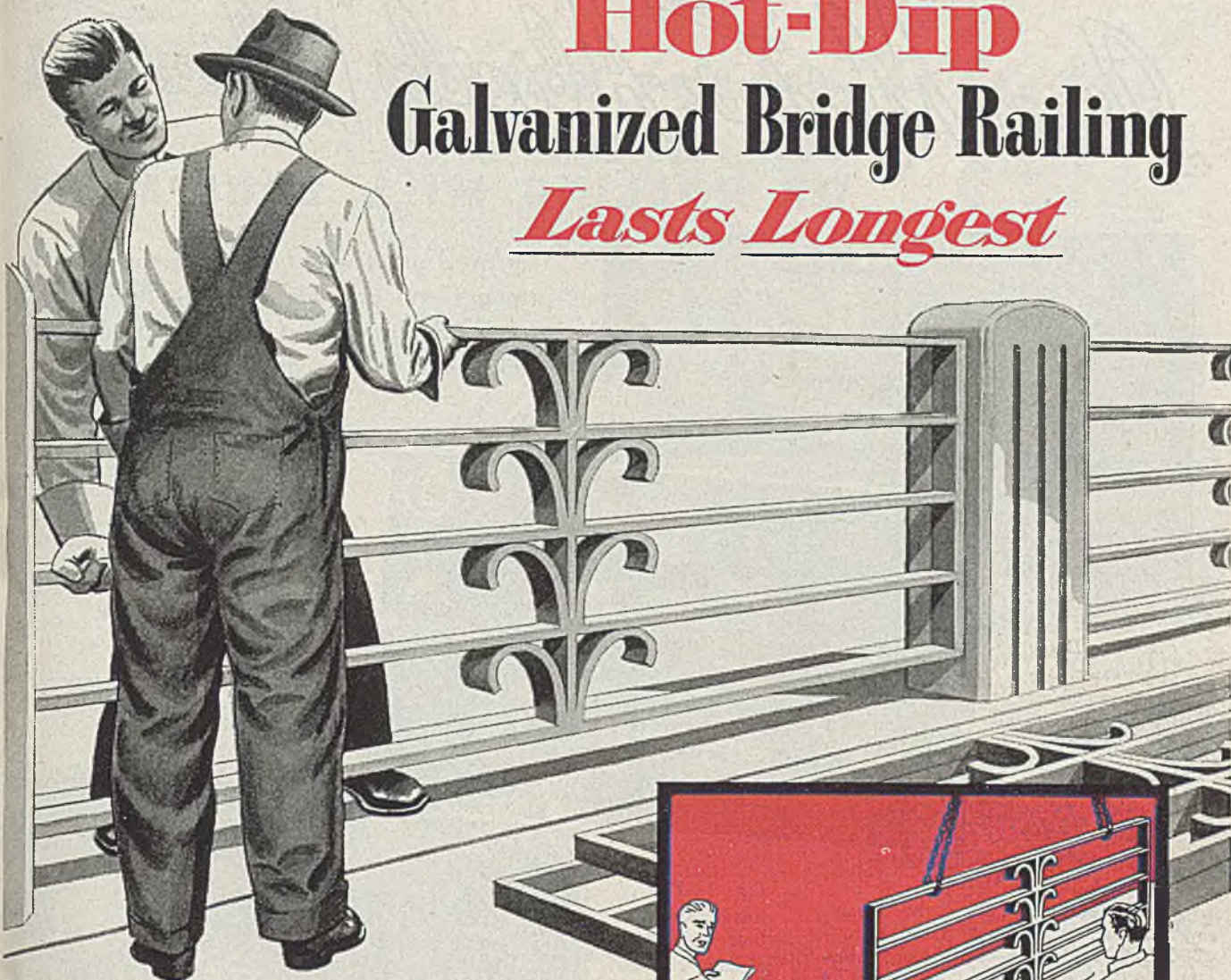
very little broken up by forging. The inclusions likewise show that only a small degree of hot working has been applied. Casting a blank nearly to size and forging in only one die thus appears to be the present standard German practice, even for very important and highly stressed parts. In some cases, parts

Fig. 6—Outside surfaces of tubing as macroetched

Fig. 7—Inside surfaces of tubing as macroetched



Hot-Dip Galvanized Bridge Railing *Lasts Longest*



YEARS and YEARS of service are added to the life of bridge railings and other exposed installations that are Hot-Dip Galvanized by the Hanlon-Gregory process. This method of fusing base metal with molten zinc is your solution to expensive maintenance problems.

The World's Largest Job Galvanizing Plant, in the very heart of the steel industry, is prepared to provide the *best proven prevention* against rust—for your products—in any quantity.

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HANLON - GREGORY GALVANIZING COMPANY



Pittsburgh,



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Iron Mortar Absorbs Vibration

OF ROLLING MILL EQUIPMENT

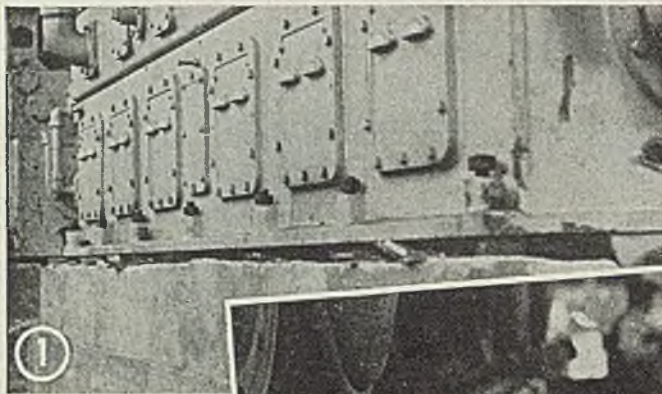


Fig. 1—Large compressor resting on shims and properly aligned



Fig. 2—Top of foundation and bolt holes are suction cleaned

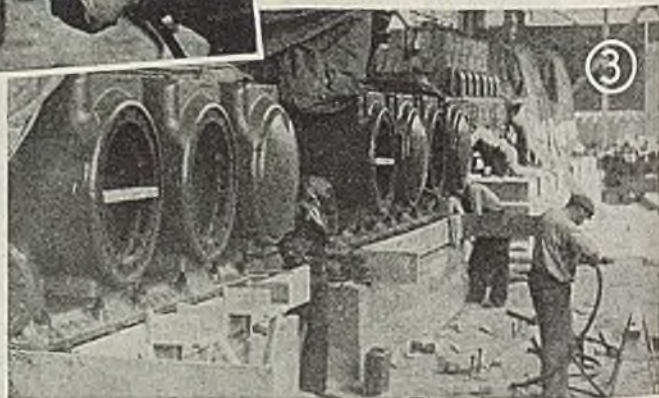


Fig. 3—Forms are built for placement of improved grout

SINCE the time of the early Romans, with the first recordings of Marcus Cato—234 B.C.—149 A.D.—iron chips from the forge have been used in mortars to eliminate shrinkage, although at that particular time the only realization they had of the subject was that in mortars, which included the use of iron chips and filings, the iron expanded and compensated for the natural shrinkage of the mortars and thus made watertight joints in their walls. However, like all things born of antiquity, they were lost from one generation to another, and are reborn in another period.

Little is heard about the use of iron in mortars until 1788, when Thomas Belidor of Paris confirmed the outstanding findings of the waterproofing values brought about in mortars through the use of properly graded iron.* Interest in this subject again subsided until 1925, when the steel industry came into the field with demands for a grout which would stand up much longer than the present-day plain mortar grout, or high early strength grouts, which they were getting with high early strength mortars. Steps were taken to devise a grout which would have much greater durability. Field work disclosed the chief reason for the failure of grouting was the shrinkage between the foundation and the bed plate and inability of a plain cement grout to take sharp impact. Shims and leveling screws were carrying the weight of the machines and, due to the natural shrinkage of the mor-

tar, the engine base plates were not resting upon the grouts in the least, but were constantly embedding themselves through vibration on shims, so that a great deal of misalignment was caused and costly repairs and shutdowns were necessary through the lack of nonshrinking qualities of the grout.

In 1925 the Master Builders Co., Cleveland, designed a specially-treated iron to be incorporated in grouts to overcome the natural shrinkage of the mortar. These irons had been used by the company in previous years to eliminate shrinkage in the repairing of concrete on buildings and large hydraulic structures. Application of this principle to the use in grouting mortars for heavy rolling mill equipment was immediately received with enthusiasm. It was found that these grouts not only eliminated the shrinkage between the foundation and the bed plate, but also afforded greatly increased strengths and

Improved grout with high early compressive strength and capable of being flowed between foundation and bedplate withstands hammering action under severe operation.

Dispersion agent lowers water required for cement, thus increasing strength and reducing amount of correction necessary in initial volume change

By JOHN D. KNOX
Steel Plant Editor, STEEL

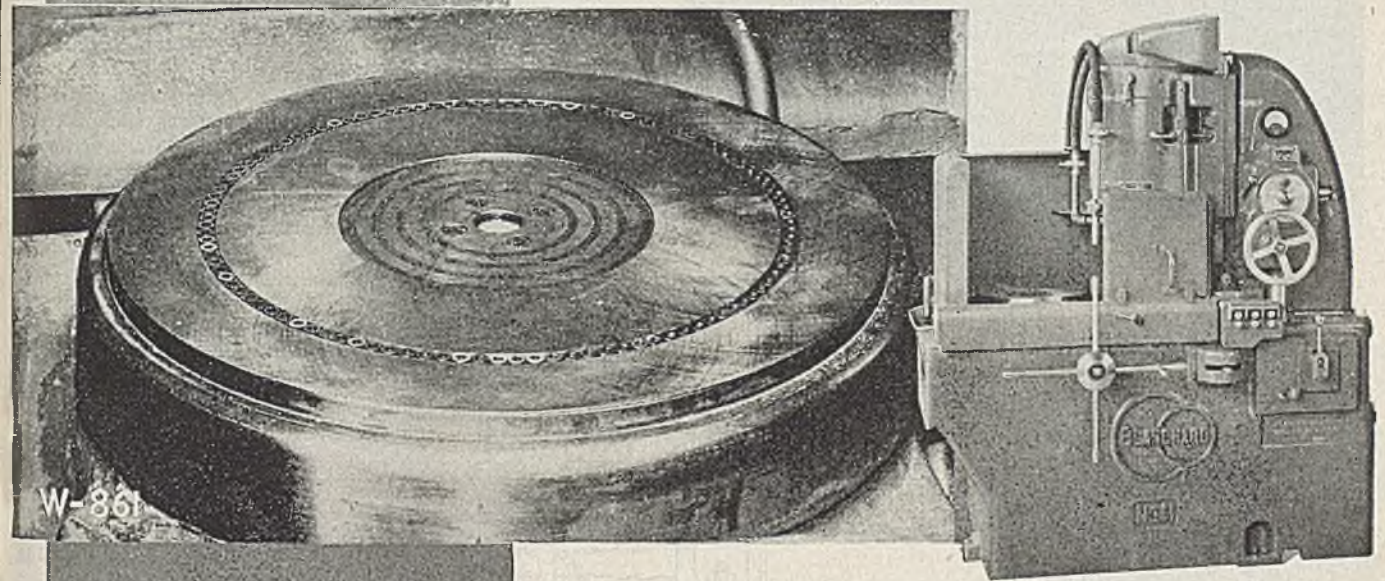
durability against the impact of pounding and vibration.

Development of this grouting material progressed over a period of years until in 1932 a discovery of a cement dispersing agent made it possible to obtain a flowable grout with 12 to 15 per cent less water. This had great advantages particularly in increased strength and further controlling shrinkage over previous methods. Cement grouts were not only greatly improved with regard to their compressive strength, because of cement dispersion, but also a large reduction in the total volume change was achieved through the reduction of the water.

This grout, known under the tradename of Embecco, is not only totally shrink-proof but its compressive strength and ductility and oilproofness proved a great advantage over any previously known grouting methods. Adoption and use of this material throughout the steel industry steadily grew until the ramifications of its use extended throughout the United States, England, India, South

*Archetecture Hydraulique, Vol. II, Book I, Chapter 9.

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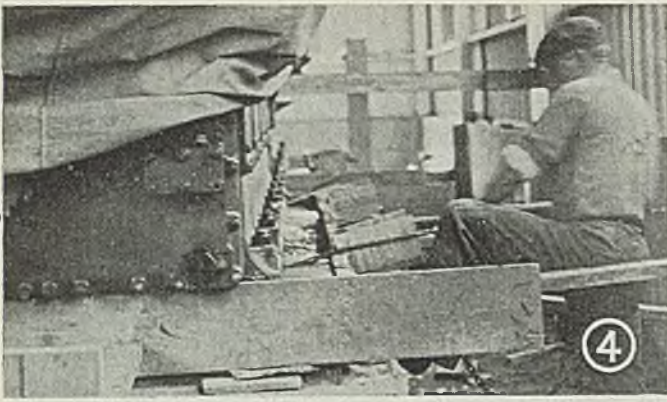
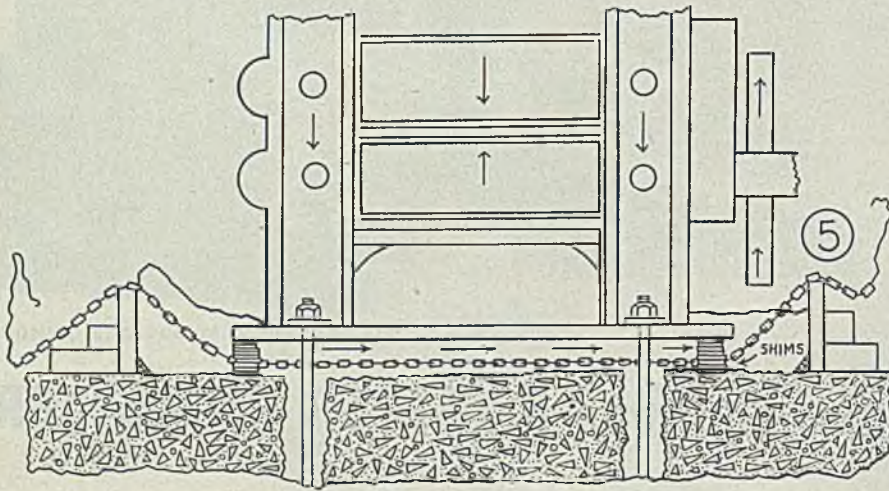


Fig. 4—Rodding and working of grout to eliminate any air pockets

Fig. 5—Diagrammatic view of machine grouted and anchored in place



Africa and Canada, and includes all of the leading steel mills of these realms.

Likewise, further developments were made on the subject in order to create a metallic aggregate of high early compressive strength, with the feature of non-shrinking quality. These were embodied in special grouts which allow the early use of equipment in periods as low as three to four hours, which are vitally important money and labor saving elements in steel mill production.

The two primary functions of Embecco are to prevent shrinkage during setting and curing and to produce high compressive strength more or less rapidly. The first of these ends is attained by the oxidation of the specially-treated iron particles, which cause their expansion. The second is accomplished by the reduction of water and the use of ingredients which promote high early strength. Further characteristics of Embecco mixes, which in a measure follow from its two primary functions, are the production of a dense mortar which confers permanent high compressive strength, resistance to corrosive agents and resistance to moisture and oil penetration. A certain ductility or elasticity is imparted by its metallic nature enabling the mortar to take up strains from vibration or impact. All these advantages, however, depend on a proper use of suitable material.

Plain fine iron particles with or without oxidizing agents added to a grouting mortar will not correct shrinkage. In fact, they have the opposite effect by increasing shrinkage. The iron particles

must be so combined with the oxidizing agent that expansion starts immediately after mixing of the grout.

Because strength and shrinkage are based fundamentally upon the amount of water used per given quantity of cement—the less water employed for required placeability, the less correction of shrinkage is required and higher are the ultimate strengths. Ordinary plastic and fluid mortars fail chiefly because of the inherent shrinkage tendencies of the solid constituents to settle, leaving a layer of water at the top surface. The dispersing agent in Embecco overcomes this extremely objectionable feature by lowering water requirements approximately 15 per cent, thus increasing the strength and reducing the amount of correction necessary in the initial volume change.

This nonshrinking concrete is being widely used in steel plants for grouting in bedplates for rolling mill housings, turboblowers, levelers, baling presses, forging hammers, compressors, machine tools, etc. The primary requisite for grouting mortar is that it should readily and solidly fill the space to be grouted and permanently retain its original volume, to the end that the unit supported will be firmly held at the correct elevation. Various steps involved in the grouting procedure follow:

1. Forms should be built of strong enough materials securely anchored and shored to completely confine and stand the pressure of the grout under working and rodding conditions. A leaky, unsecure form increases the cost of the grouting

job and also wastes much time and material.

2. Junctures of the form should be caulked with a mix of equal parts of cement and sand previous to placing the grout.

3. Waste material or any water should be removed from the anchor bolt holes by an air syphon or other method. Maximum strength is required at these points and the dilution of a properly mixed grout can lead to costly consequences, such as characteristic cracking of the grouts vertically parallel to the anchor bolts.

4. The slab of the foundation should be cleaned off with liberal quantities of water before setting the equipment. Any oil should be removed by the application of a strong caustic solution. The slab also should present a roughened condition for good bond with grout, and should be moist and blotter-like in appearance to assure an easy flow of the grout and prevent its too rapid drying out. However, the grout should not be placed while excess water remains on the roughened surface of the foundation slab.

5. Adequate clearance between forms and bedplate for working grout should be provided.

6. Removal of shims or the loosening of leveling screws is not required when the nonshrinking grout is used as is the case with plain grouts.

7. Working out any air pockets and thus compacting the grout is accomplished by placing $\frac{1}{2}$ to 1-in. link chain under the equipment at intervals before the grout is poured and with wire attached to the ends for passing around the anchor bolts.

8. Grout should be poured from one end or side only to avoid excessive air entrapment and to assure compactness of grout.

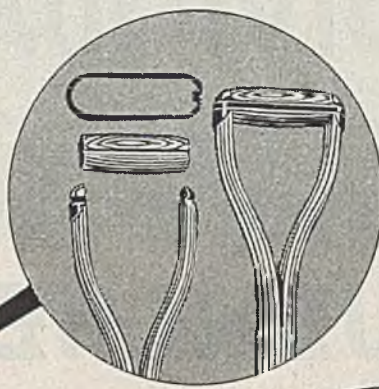
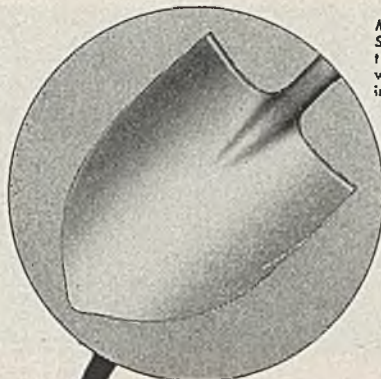
9. Any machines operating nearby should be shut down during the initial setting period of the new grout so that vibration will not be transmitted into the foundation of the equipment being grouted and thus cause fracture.

If the grout is poured in cold weather it is advisable to increase the temperature of the equipment and slab as well as that of the room to 70 degrees Fahr. in order to eliminate the danger of the cold being transmitted from the machine and concrete base into the grout, thus causing the ill effects of a retarded set. This may be accomplished by steaming the base plates or through the use of electric heating coils.

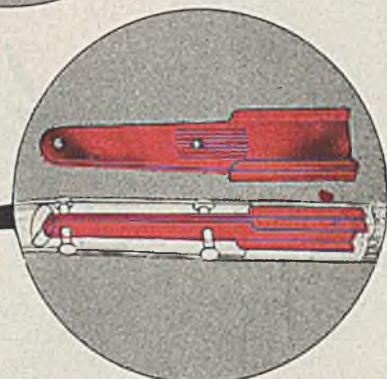
Salamanders should never be used in close proximity to the grout inasmuch as sulphur gases permanently damage and have a retarding effect upon the setting of green grout.

Temperature of the grouting mixture has a direct effect on the setting time. It is difficult to increase the temperature of cold grout after it has been placed by external methods. Once the temperature of the grouting mix is increased to 70 degrees or higher, it is simple to maintain the setting time and hydrating qualities by keeping outside temperature above freezing.

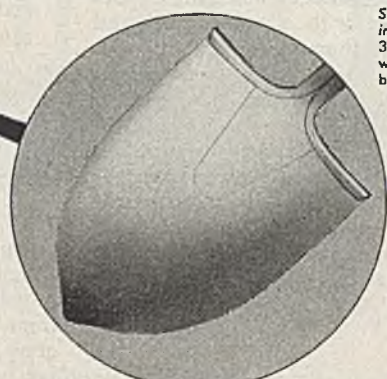
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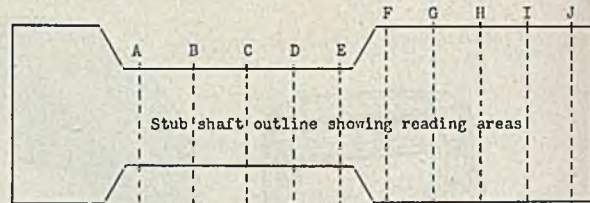
For Machine Parts

By A. R. HOTCHKISS

SOMETIMES in quench hardening machine parts by the conventional tank immersion method, the metallurgist finds that he must sacrifice something in desired hardness with a given steel and quenching medium or use a harsher quench and draw the part back to avoid brittleness. In either case the result is not the most desirable.

Some months ago it became necessary to carry on a series of experiments to check a method of overcoming this handicap where a milder quench of oil could be retained and yet the hardness could be raised from 45 to 55-59 rockwell "C." The method that was being used by

Right—Rockwell "C" readings obtained on stub shaft at the 10 points indicated, when using the pressure quench described



	A	B	C	D	E	F	G	H	I	J
1st Part Tested	56	57	55	59	55	53	60	56	57	54
	58	58	57	54	58	63	59	54	57	58
	58	60	59	55	55	59	56	55	55	58
	56	57	55	56	55	60	58	55	55	57
	56	56	55	57	55	56	60	58	60	57
	55	61	56	56	57	54	59	59	56	56
2nd Part Tested	58	57	56	57	53	60	54	61	55	59
	58	55	56	56	58	61	57	57	57	54
	58	55	56	54	57	56	56	54	55	61
	60	55	58	56	56	55	56	57	58	60
	60	58	55	56	57	53	56	56	57	55
	56	55	56	58	55	54	57	59	56	58
3rd Part Tested	59	57	55	54	54	56	57	61	56	55
	56	57	56	56	54	55	57	58	55	53
	59	58	55	55	54	58	55	63	54	54
	56	57	57	55	56	58	54	61	58	58
	57	56	57	55	58	58	54	61	54	56
	60	55	55	55	58	58	58	58	58	56
4th Part Tested	60	55	58	54	53	55	58	61	54	55
	56	57	55	57	54	56	56	58	56	54
	56	56	56	53	55	56	56	56	57	58
	56	58	54	56	55	58	58	53	56	57
	56	57	55	56	54	58	57	58	57	54
	57	57	58	57	56	60	57	56	57	57
5th Part Tested	55	55	52	54	51	57	57	57	56	58
	58	55	56	54	52	56	57	58	56	57
	55	55	55	56	61	56	56	57	57	57
	55	54	55	54	52	58	58	57	56	57
	53	52	55	57	56	55	53	56	57	56
	55	57	59	56	54	55	58	57	57	56
6th Part Tested	54	60	57	57	57	56	56	57	56	56
	54	55	57	57	58	57	56	58	57	57
	55	56	59	55	57	57	57	57	57	58
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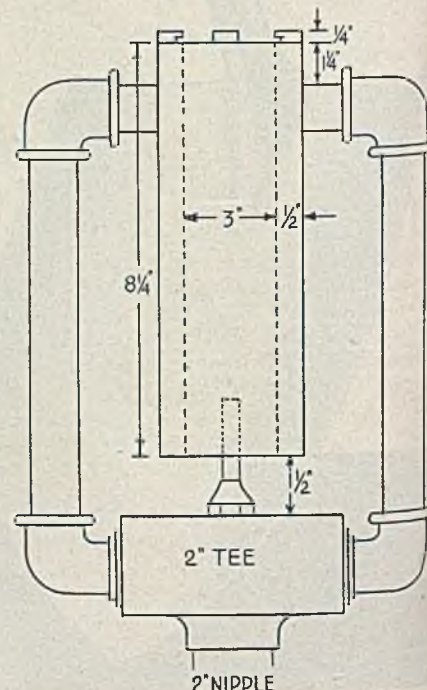
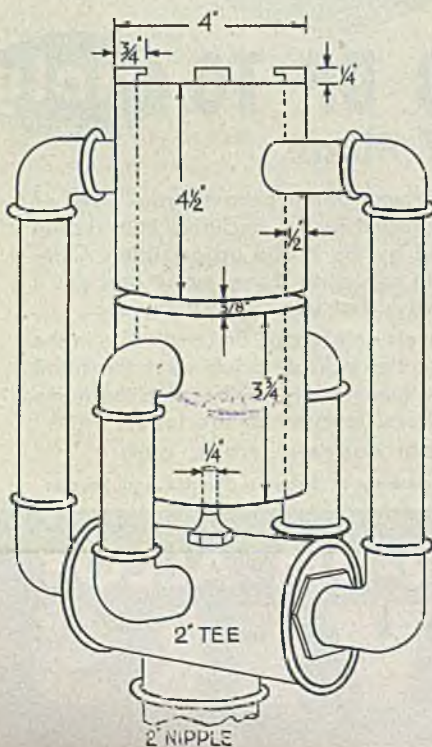
this plant at the time on stub shafts, with which we were concerned, was to quench in cold water for a period of 10 seconds, from a furnace temperature of 1450 degrees Fahr., followed by finishing in a salt bath at 900 degrees Fahr. An average reading of 45 rockwell C was all that could be obtained in this way. This was lower than the service demanded but being the best obtainable was tolerated.

We began working on the theory that a milder quench flowing around a part in sufficient quantity and speed would drop the temperature rapidly enough to increase the hardness to the desired range in one single operation and thus eliminate the draw.

Left—Oil pressure-quench arrangement, employing the 2-part sleeve. Inner surface of both sleeves is drilled with a No. 42 drill, the rows being spaced 3/8-inch apart and the holes 3/8-inch apart in each row, alternate rows staggered. Fittings from 2-inch Tee to sleeves are 3/4-inch

Right—Single sleeve oil pressure-quench setup is similar to the 2-part sleeve

A double walled sleeve was made out of sheet metal with sufficient diameter to admit the part to be treated with a clearance of approximately 1/2-inch all around. (Please turn to Page 156)



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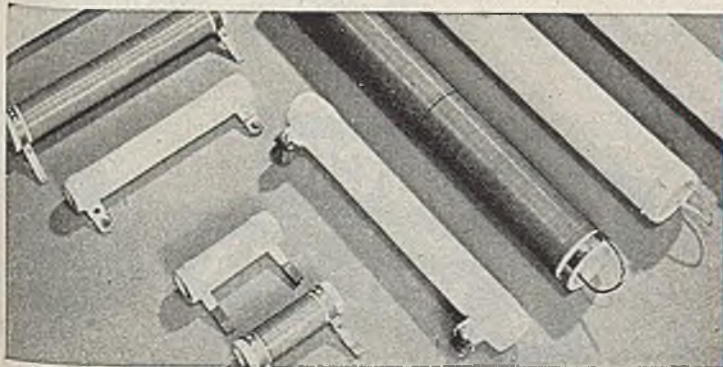
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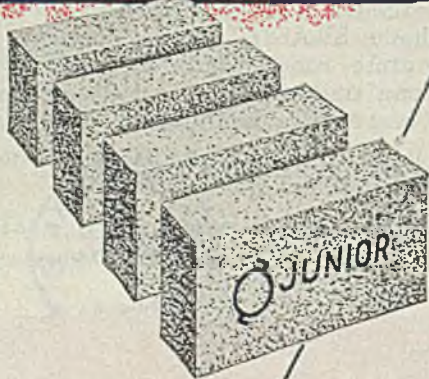
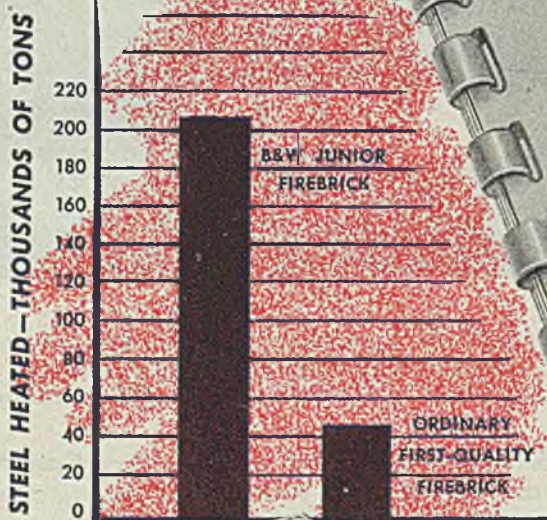
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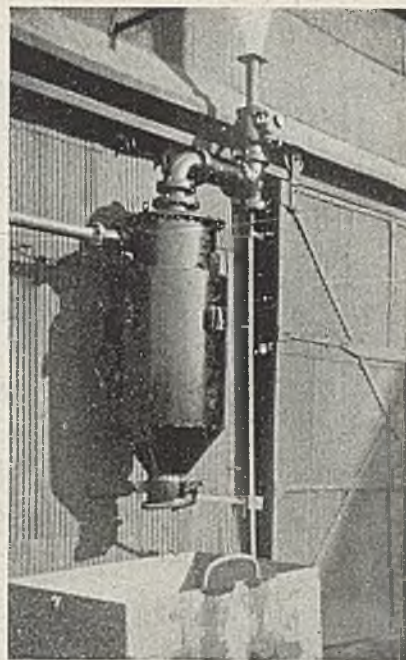
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Vacuum System

... Removes dust from Open-Hearth Flues

Dirt from open-hearth cellars is conveyed by suction through a steel collector main to a receiving tank which empties either into a box or gondola car. Unit can be transferred from one open hearth to another or can be installed permanently. Savings in man-hours range from 50 to 70 per cent, based on early installations. Steam consumption varies from 1800 to 3000 pounds per hour at 125 pounds nozzle pressure



Receiving tank which empties into the box

ANOTHER tough job around the open hearth has been taken over by an appliance which eliminates sweat and toil—that of removing dust from the flues by a vacuum system. The unit is built of rolled steel plates and is of electric welded construction with special abrasive-resisting plates in the cyclone part of the unit which can be replaced when desired.

The system consists of a receiver and steam exhauster which creates a vacuum, standard steel pipe with cast-iron fittings, 60 ft of flexible hose and a receiving nozzle. The receiving nozzle and hose, which are connected to the branch collector lines in the flues, are taken directly into the flues. Dirt is conveyed to the tank for dumping at the rate of 4 to 7 tons per hr, depending upon the size of the unit employed. The material can be moistened before

removal though too much wetting causes it to cake in the conveying system.

A few months ago at an Eastern steel plant, a unit was positioned directly over a standard gondola car into which the material from the furnace was discharged. The cleanout of the open-hearth furnace was effected in about 56 hrs after the fuel oil was shut off with a total of 188 man-hours or a saving of 50 per cent compared with former practice.

Disposal Method Optional

Disposal of the collected material is handled differently by each installation. It can be discharged from the unit into a box or directly into a gondola car which is the best arrangement it is possible to make.

The system can be removed from one furnace to another, or a permanent installation can be made—the unit taking

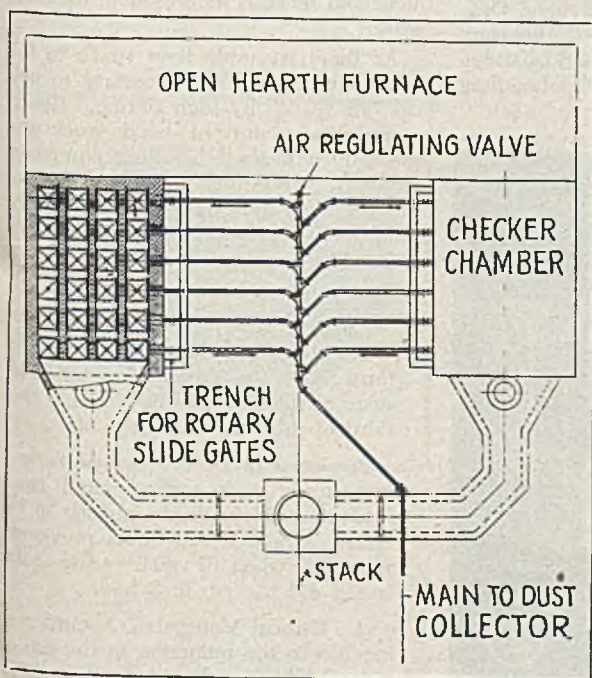
care of six to eight furnaces. The system has been operated at an Eastern open-hearth shop on a vacuum of 6 to 9 in. through a 6-in. collector system. A 4-in. system conveying flue dust 300 ft and with a 60-ft lift requires about 1800 lb of steam per hour at 125 lb line pressure, and with a ¼-in. nozzle in the exhauster.

Different size collectors or conveyor systems have different consumptions of steam. On a 6-in. hookup with a 300-ft horizontal pull and an 80-ft lift, the steam consumption is about 2800 lb per hr at 125 lb line pressure using ¾-in. nozzles in the exhauster. Vertical lifts of 120 ft maximum, and horizontal pulls up to 500 ft in each direction are within practical working limits of the equipment.

Other Applications Studied

The unit is in use at the plant of the Alan Wood Steel Co., Conshohocken, Pa., and several other steel plants. Consideration is being given to the use of the equipment for removing scale from the pits of blooming and other type mills, for removing cinder at soaking pits, and other applications such as for conveying anthracite coal, coke from soaking pit cellars, dolomite, burned lime, fluorspar, silico sand, etc.

Plans are under way to install a permanent system to keep the furnace flues free of accumulated material during its entire campaign. This involves the construction of collector pockets beneath the rider walls, checkers and in some parts of the flues leading to the stack—all connected with a piping system to the vacuum system. The installation will be fully automatic and will afford a sharp working furnace. The device is a development of the Vacuum Conveyor Co., 313 North Twentieth street, Philadelphia.



Partial sectional and plan view of open-hearth checker chambers showing location of collector mains

PALLETIZING SHIPMENTS...

of cartridge tanks cuts \$88,000 from cost of one Navy Bureau of Ordnance contract. Time for loading freight cars is reduced from 4 to 1½ hours as labor and materials requirements also drop

PALLETIZED shipments of cartridge tanks for the Navy's Bureau of Ordnance conserve critical container materials, as well as time and labor in loading and unloading freight cars. In comparison to former methods of preparing shipments at Florence Stove Co., Gardner, Mass., this method of handling shipments has shown a reduction of \$88,000 from the cost of one ordnance contract, according to *The Palletizer*, publication of the Naval Ordnance Materials Handling Laboratory at U. S. Naval Ammunition Depot, Hingham, Mass.

Formerly, after fabrication, painting and drying, tanks were conveyed to the crating department. There the ends of each tank were covered with a cardboard protector. Then 12 tanks were packed in a wooden crate. Nineteen board feet of lumber and sizable quantities of critical fiberboard were used in this older method of packing. Two men were required to place protectors around the ends of the tanks; 6 carpenters spent an estimated one-third of their time assembling crates; and 3 men were needed to pack the tanks and seal the crates.

Upon completion of the packing, crates of tanks were conveyed to the warehouse. There the crates were han-



dled from conveyors to carloading platforms with two-wheel hand trucks. These trucks had to be towed up a ramp to the loading dock 4½ feet higher than the warehouse floor, by means of hooks attached to a power-driven endless chain. Five men from the shipping room in 4 hours loaded 80 crates containing 960 tanks into freight cars.

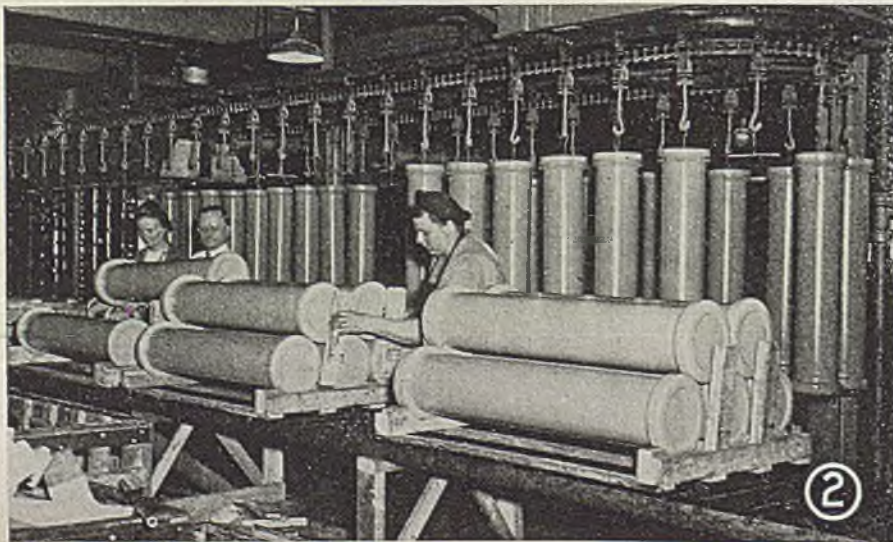
Palletization was recommended to company officials by the Bureau of Ordnance after an officer of the Naval Ordnance Materials Handling Laboratory had studied the flow of finished cartridge tanks in relation to existing handling

equipment. Under the handling routine devised at the Bureau's laboratory, tanks now are taken from the drying racks, placed on the simple reusable racks shown in Fig. 2 and conveyed directly to the warehouse by the roller conveyor shown in Fig. 1. There they are palletized, as in Fig. 3, in units of 25 tanks each, and two of these are joined to make one 50-tank pallet load. This simplified procedure eliminates the crating department and releases its personnel for other work.

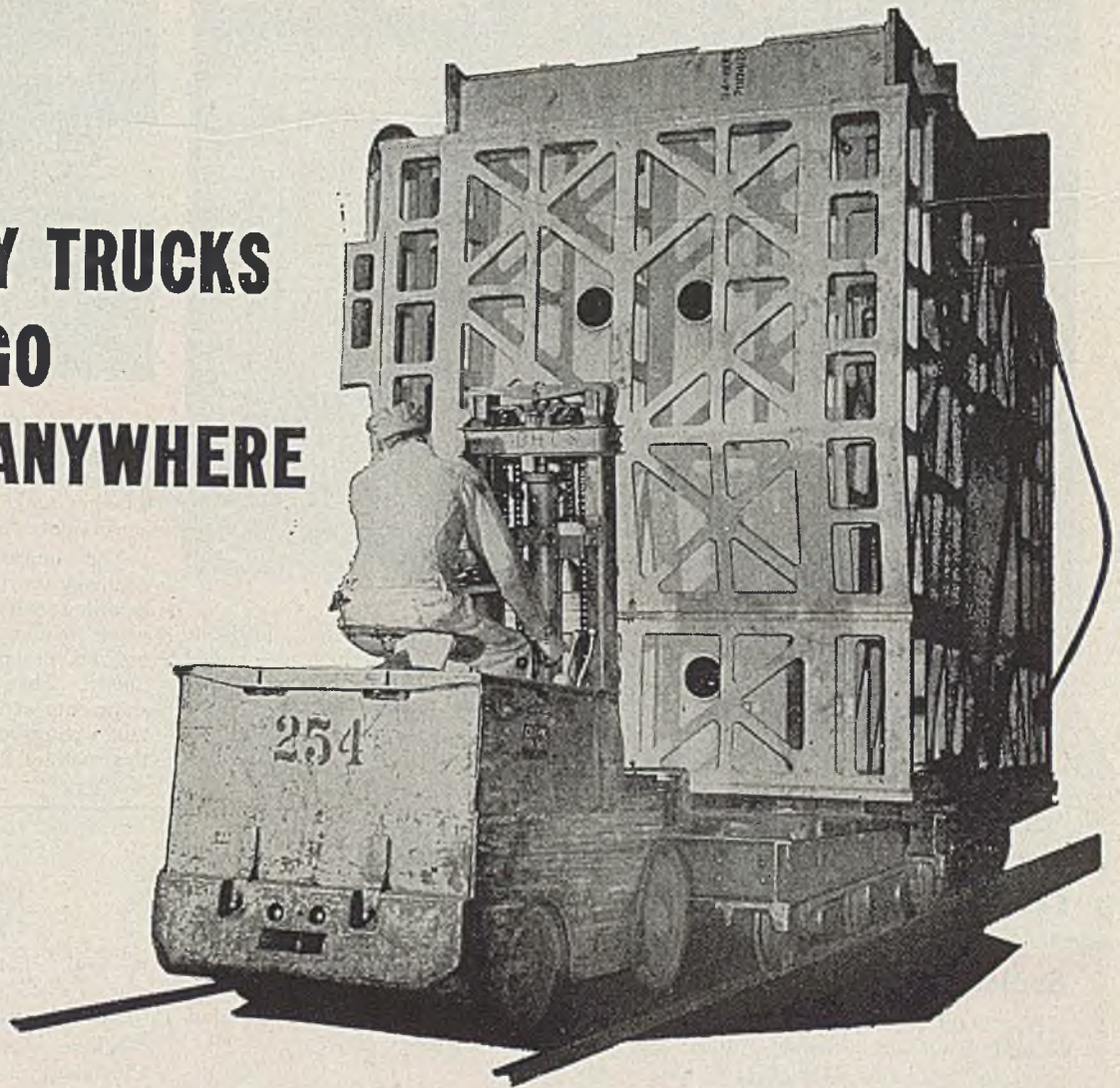
As there is ample floor space in this warehouse, it was not necessary to utilize "air space" by high tiering. Consequently, a motorized hand truck was the only additional handling equipment required. This truck moves the double-tiered pallets from the warehouse up the ramp to the carloading dock. Palletized tanks then are loaded into the cars.

Savings from this operation are as follows:

1. Manpower: Four men now perform the entire shipping operation instead of the 10 men full time and one-third of the time of 6 carpenters.
2. Loading Time: One of these 4 men using a motorized hand truck loads and blocks the freight car in 1½ hours, as against 20 hours previously required when 5 men using hand trucks did the job in 3 hours.
3. Critical Materials: A third saving lies in the reduction in the use of critical fiberboard and lumber, 2520



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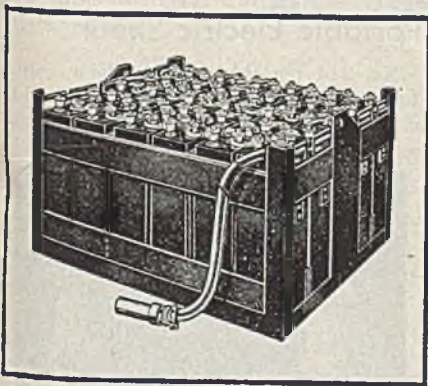
BECAUSE they are quiet and free from fumes, battery industrial trucks can be used without restriction in virtually any department of the plant. They can even be provided with spark-enclosed construction for operation in locations where fire and explosion hazards may exist.

They use low-cost electric power, and they use it with maximum economy, because they start instantly, yet consume no power during stops. With electric-motor drive for both traction and lifting, they have a minimum of wearing parts; are easy to maintain; are rarely out of service for repairs.

Thus, they are inherently dependable and economical, and this is espe-

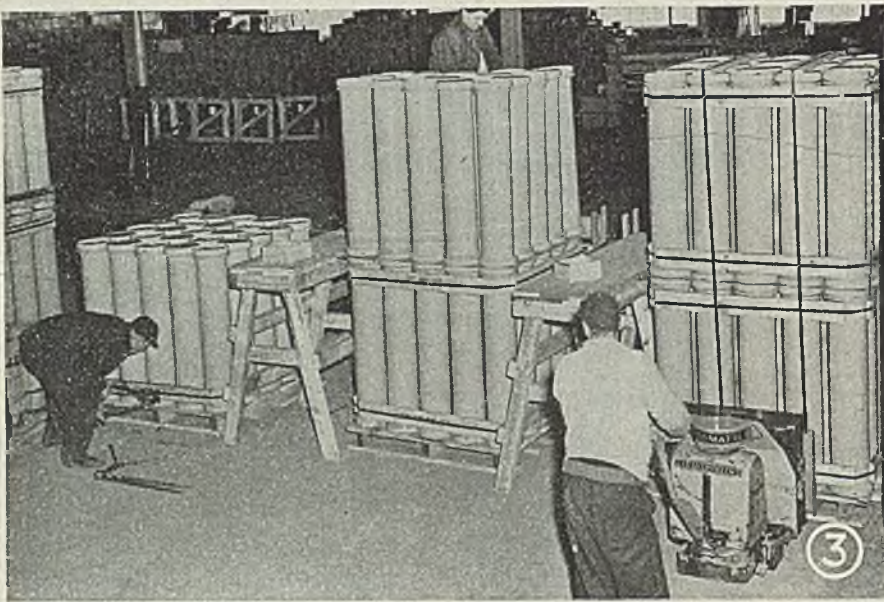
cially important in the war industries where they are working 24 hours a day. Here they have the additional advantage of operating from one battery while another is on charge; except for the few minutes needed to exchange batteries, they need not stop for servicing of the power unit.

They are extra dependable and extra economical when Edison alkaline batteries are used. With steel cell construction, a solution which is a natural preservative of steel, and a fool-proof principle of operation, they are the longest-lived and most durable of all storage batteries. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*



Edison

ALKALINE BATTERIES



board feet of scarce lumber being saved daily.

Figs. 3 and 4 illustrate the techniques employed to achieve these savings. In Fig. 3, three men palletize and strap while the fourth man with motorized

hand truck moves the unit loads to freight car and blocks the car. Fig. 4 shows the pallet loads as they are placed, 18 to every freight car.

Obviously, any one of the above savings would by itself have made the

switch to palletized shipping and car-loading worthwhile. The three savings together make possible a daily net saving of more than \$320.

The impressive experience of this company is typical of the lower materials handling costs that are being obtained when manufacturing companies standardized on palletized unit load shipments. That many kinds of unit load shipments can be handled with important savings of time and manpower by this method has been amply proved.

INDUSTRIAL EQUIPMENT

Sealed Resistors

No. 1000 series hermetically sealed accurate fixed wire wound resistors, offered by Shallcross Mfg. Co., Collingdale, Pa., are impervious to moisture, fungus, vibration and rough handling. They are constructed without glass, without use of fragile "floating" or stud-locked resistance elements and without



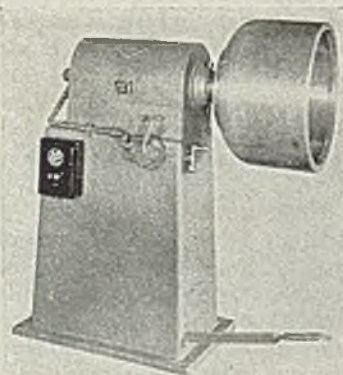
ferrule terminals or caps which give rise to possibility of strain and sealing failure. They utilize standard mounting facilities. They are at present available in two designs and in all resistance values from 1000 ohms to 10 megohms. High ohmic value noninduction resistances can be enclosed in this type of construction without danger of difficulties due to leakage.

Both the resistance form and the protective shell are of ceramic. Resistance winding element and outer shell are a complete, integral unit without internal leads or floating wires. Positive solder-sealing without use of ferrule caps or glass drawing gives protection against moisture and fungus. Windings are of

standard noninductive pie type and terminals are of the standard solder lug type. Mounting is accomplished by standard mounting hole.

Variable Speed Lathe

Providing a new method for polishing and finishing cooking utensils, bowls, kettles, reflectors and similarly shaped articles, a new heavy duty variable speed lathe with vacuum holding fixtures makes



possible simultaneous polishing of the object with an evenness of luster.

With this machine the part is revolved, instead of bringing it up against a revolving abrasive or polishing wheel. The part is held in the fixture by vacuum. The machine is capable of handling wide range of vacuum type holding fixture, each designed for the particular object to

be held. This type of fixture will not mar or distort the part.

The unit, manufactured by Schaurer Machine Co., 2048 Reading road, Cincinnati 2, features a continuously operating motor; single foot pedal control of clutch and brake; large disk-type brake, for extremely fast stopping of the spindle. Motor is coupled to the work spindle through a Twin-Disc clutch assembly and Reeves variable speed drive. Infinitely variable speeds, from a minimum of 100 rpm to a maximum of 4800 rpm in a ratio of 6 to 1 or 12 to 1, are available.

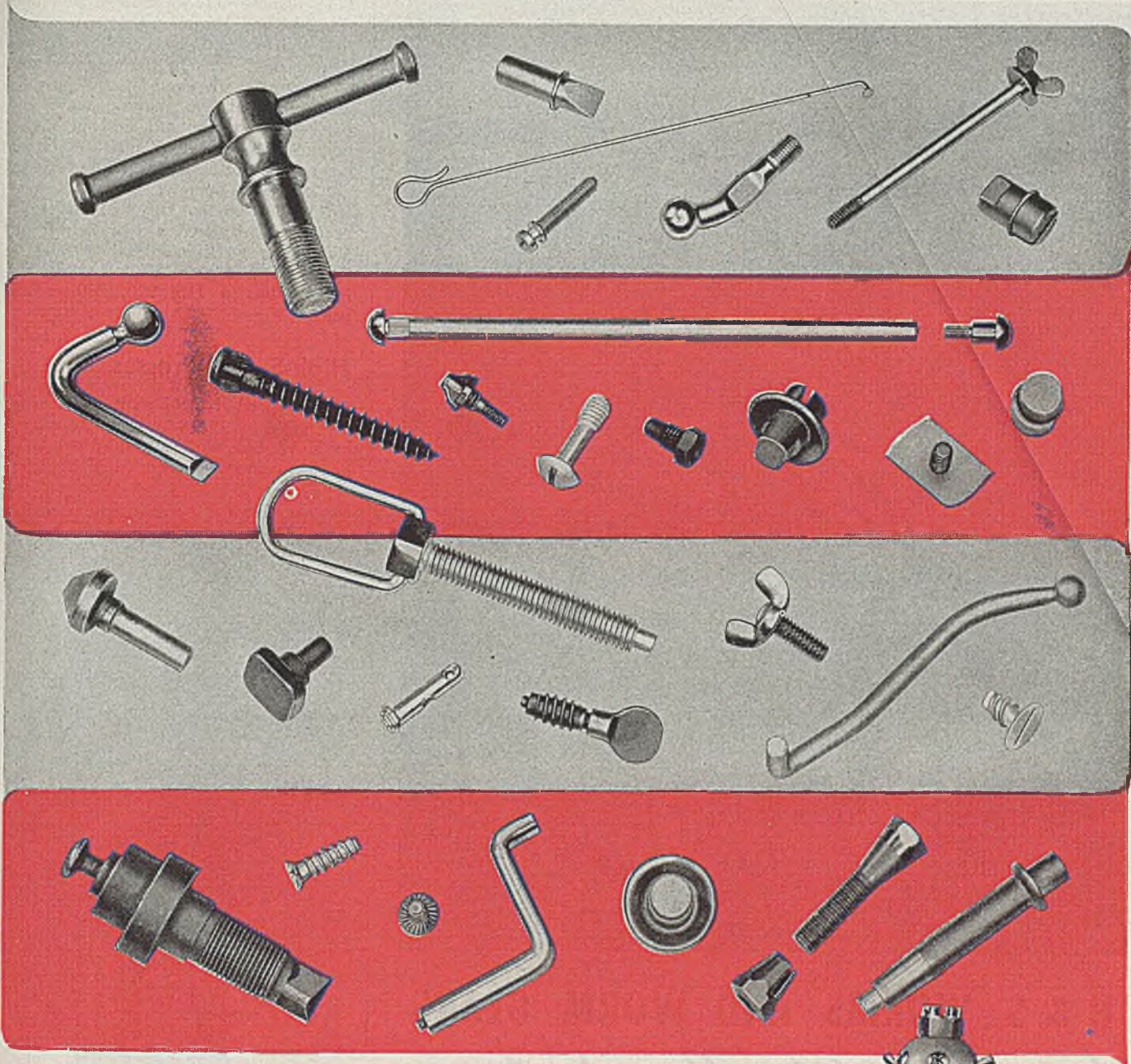
Portable Electric Shear

No. 214 portable electric shear, introduced by Stanley Electric Tools, Division of Stanley Works, New Britain, Conn.,



cuts 14-gage hot rolled steel and other sheet materials in proportion. First introduced for use in aircraft production, the device has proved its usefulness in

(All claims are those of the manufacturer of the equipment being described.)



Yes we make "SPECIALS"!

Just take a good look at the picture above—a sample assortment of nonstandard products which we have made by the upset method. Most of these could not have been produced, in the time and quantity required, in any other way.

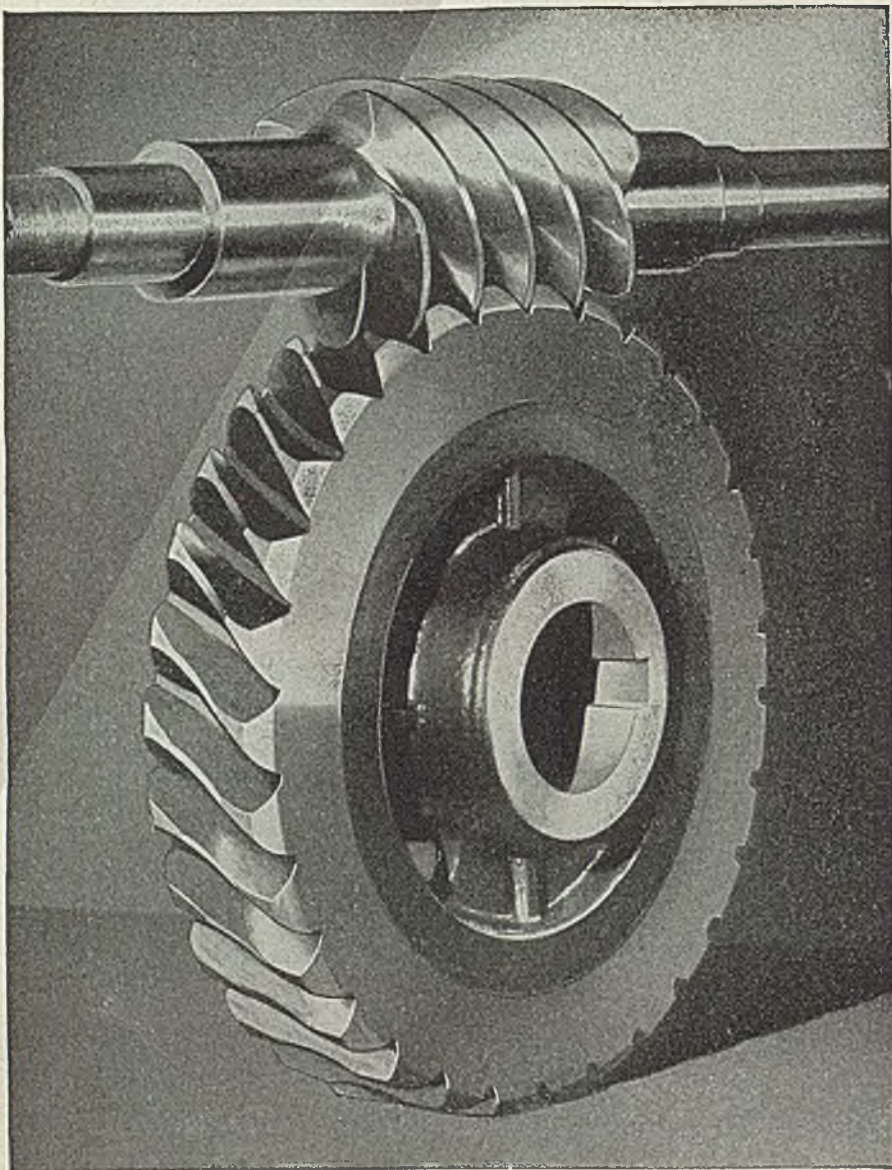
The upset or cold forging method also saves materials and lowers costs. And in many cases it makes a stronger, better product than that produced by other methods.

Maybe we can show YOU some important SAVINGS. Tough "specials" are right down our alley. Write us.



National
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PRODUCTS

THE NATIONAL SCREW & MFG. CO., CLEVELAND 4, O.



H & S WORMS AND WORM GEARS have 6 outstanding features

1. Glass hard worm surfaces.
2. Worms ground all over to an accuracy of less than .001".
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4. Gear hobs ground exactly to the contour of worm.
5. Bronze for gears made to strict specifications from virgin metals.
6. Inspected on micrometer inspection fixtures.

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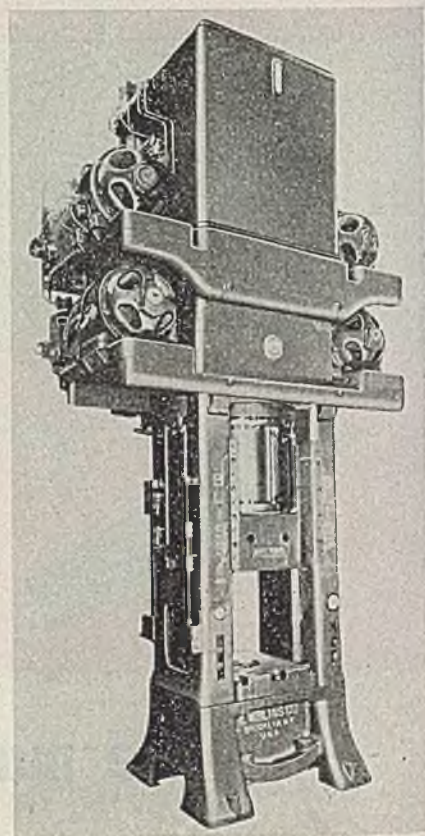
THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

other plants where sheet steel, aluminum or galvanized iron are fabricated.

Designated as Unishear, it has a blade motion that feeds in the work so that little effort is required by the operator to cut straight lines, curves, angles and notches accurately and without distortion of the material. Blades can be removed for resharpening and replaced quickly. Slide-operated switch is located in the handle. Full ball and roller bearing construction is featured. It has a universal type motor that operates on either alternating or direct current, and is available in 115, 220, 230 or 250 volts.

High-Speed Presses

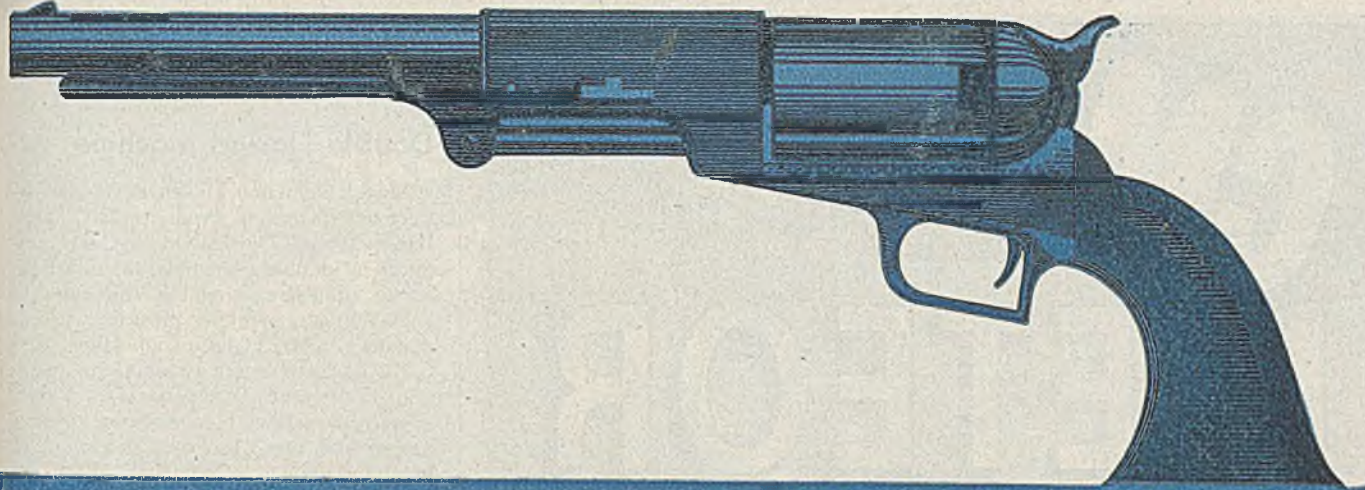
High-speed Hydro-Dynamic presses for the nosing of the 8-in. shell are offered by E. W. Bliss Co., Fifty-third street and Second avenue, Brooklyn 32, N. Y. These



presses are equipped with a 400-hp pumping unit which provides a 5½ sec pressing cycle. This fast pressing cycle prolongs die life and assures uniformity of the product since contact of the dies with the hot work is reduced to a minimum. To aid fast operation the reversal is controlled by four-way valves of special design which permits a fast yet shockless reversal.

On some installations loading and unloading devices operating in automatic or electrically controlled sequence with the press cycle are provided to reduce the labor of handling the shells to a minimum.

General dimensional specifications of the unit are as follows: Capacity, 500 tons; bed area, 40 x 37 in.; stroke of



In 1835 WHEN THIS REVOLVER WAS INVENTED —

40-YEAR-OLD FREEDOM FORGE WAS PRODUCING 300 TONS OF BLOOMS A YEAR



With the name still a household word, it is hard to believe that the Colt revolver is 110 years old. It has been an important weapon in every war, played a big part in opening up the West in the days when every man had to be prepared to battle Indians or desperadoes at a moment's notice, and was the first step in the trend to modern automatic weapons that give today's squad the

fire power of yesterday's regiment.

When the Colt revolver was invented, Freedom Forge—now Baldwin's Standard Steel Works Division—had already been turning our ferrous products for 40 years. The plant was rebuilt in 1835, with one chafery and six refinery fires, giving a capacity of 800 tons of blooms annually. Throughout the intervening time it has been an important supplier to American Industry, producing the metals that helped to fight each war, serving the railroads that helped to knit the nation together, supplying industry with

castings and forgings to help work production miracles.

When you need castings and forgings that are out-of-the-ordinary in size, complication or service qualities, you'll find 150 years of experience waiting to serve you. Whatever your needs, the best way to be sure of satisfaction is to "Standardize on Standard." The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U.S.A. Offices: Philadelphia, New York, Washington, Boston, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Houston, Pittsburgh.



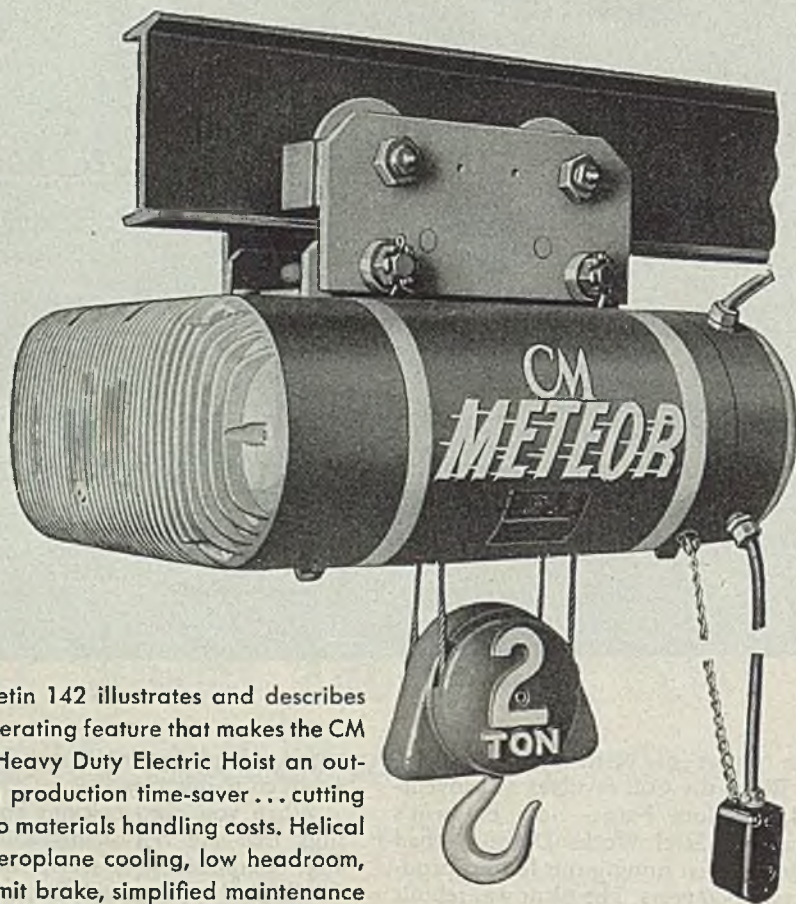
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Handling Costs

METEOR



CM Bulletin 142 illustrates and describes every operating feature that makes the CM Meteor Heavy Duty Electric Hoist an outstanding production time-saver... cutting deep into materials handling costs. Helical gears, aeroplane cooling, low headroom, safety limit brake, simplified maintenance... these and other advantages are explained in terms of operating efficiency and service life. Various types trolleys and accessory equipment, lift and speed tables, dimensions, etc., are included.

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Just ask for Bulletin 142.**

Capacities from 1/2 ton and up.
Lifting speeds from 18 to 60
feet per minute... Low head-
room. Hook suspension, plain,
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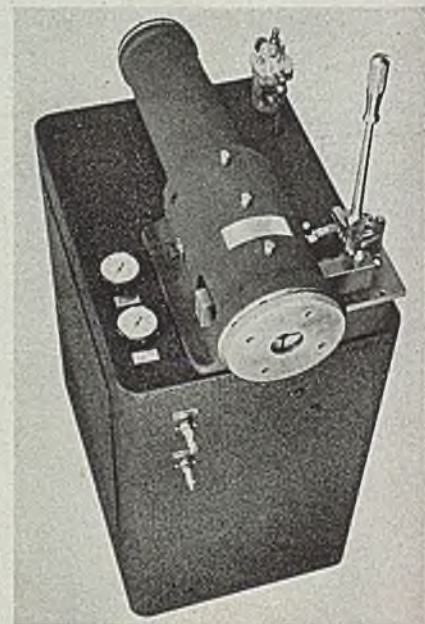
SALES OFFICES: New York, Chicago and Cleveland

press, 24 in. Pressing speed for closing is 600 in. per minute; for pressing, 190 in. per minute; for return, 650 in. per min.

Double Flaring Machine

Model DF Tube Master developed by Leonard Precision Products Co., 1100 Larson avenue, Garden Grove, Calif., produces a double thickness of metal on flange of flares, enabling the tube to hold a greater working pressure and eliminating failure at tube connection.

No hand tools are required in operation of the unit. To change size of dies, operator unscrews face plate and inserts proper size dies. Tool bar slides out of head for change of punches. While intended for nonferrous tubing, sizes 1/8 to 1/2-in., special dies can be provided to handle annealed ferrous tubing sizes



1/8 to 3/8-in. This model is entirely pneumatic in operation and requires an average of 100 lb air line pressure.

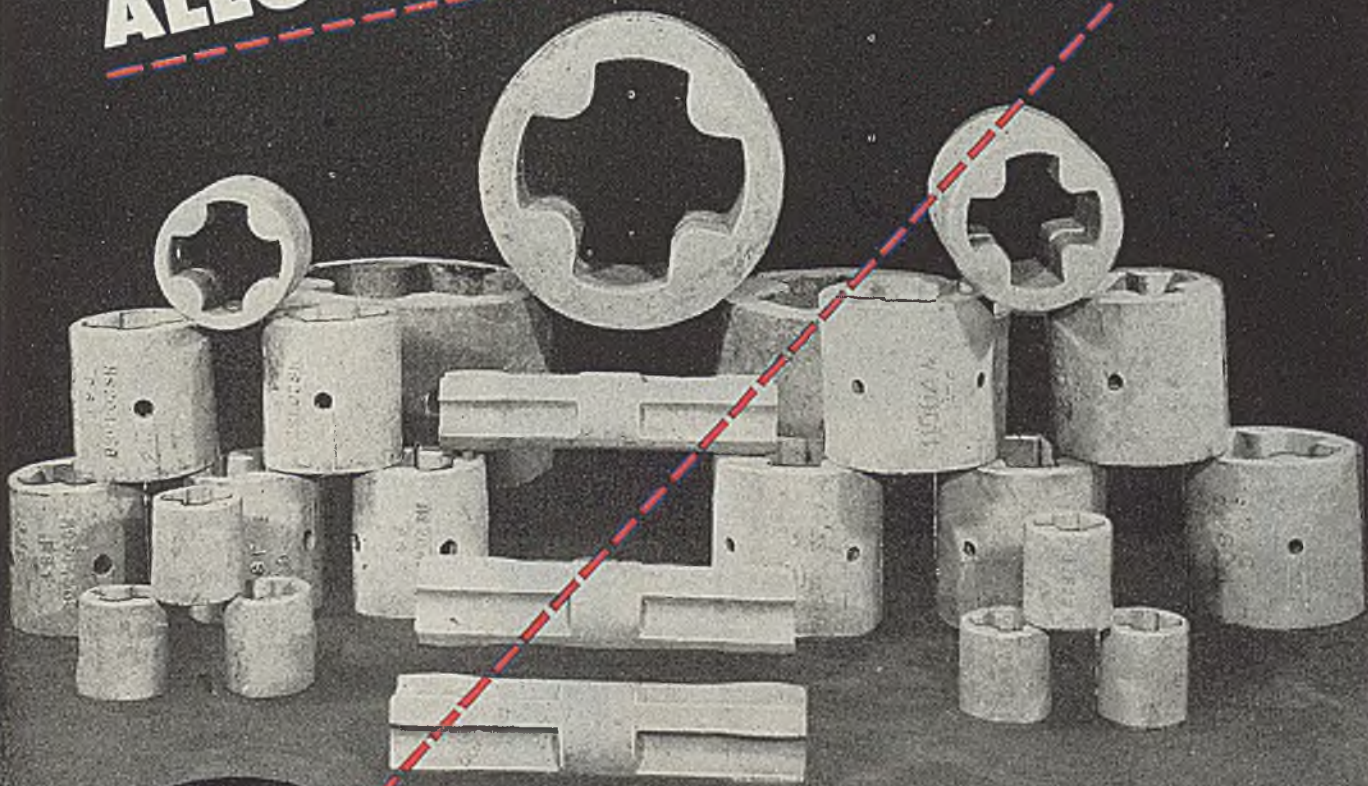
To produce double flares, the operating lever which indexes at three positions, is first pressed to open dies for insertion of tubing. Then by moving lever to other two positions, flare is completed. Double flares can be produced at 400 to 600 flares per hour, depending upon aptitude of operator. A minimum of 2 in. of straight tubing is required for gripping tube.

Fastener Assembly

Designated as Spring Lock Fastener, a new 1-piece fastener assembly which does not require nuts or receptacles has been developed by Simmons Fastener Division, Simmons Machine Tool Corp., Albany 1, N. Y. This fastener eliminates the need of lock washers and will not work loose from vibration.

The device is self adjusting to compensate for various material thicknesses within the range of the fastener and locks and unlocks with a quarter turn in a 90

HEAT TREATED ALLOY STEEL CASTINGS



*That's
our Dish*

Illustrated above is a typical group of coupling boxes and spindles—cast in Pitaloy (a special PSF-developed analysis) and heat treated to 400-500 Brinell on all wearing surfaces. If desired, jobs like these are also cast in carbon steel, and PSF heat treating technique and facilities get results with carbon steel that you'd find very interesting. • Where your problems involve heat treated castings, let us work with you.

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You change Materials Handling from a slow, costly "necessary evil"—into a dynamic, useful servant of faster, better planned Production and Distribution—when you use

CLARK fork trucks GAS AND ELECTRIC POWERED

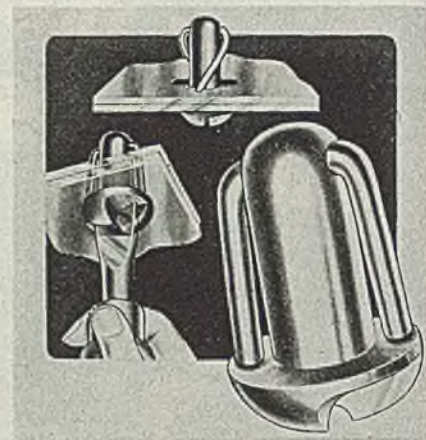
To see the wide range of usefulness of Clark Tractors and Fork Trucks, send for handy 72-page pocket catalog—describes 60 husky, well engineered vehicles, gas and electric powered.



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AXLES FOR TRUCKS AND BUSES • AXLE HOUSINGS • BLIND RIVETS
INDUSTRIAL TRUCKS AND TRACTORS • HIGH-SPEED DRILLS AND REAMERS
METAL SPOKE WHEELS • GEARS AND FORGINGS • RAILWAY TRUCKS

degree clockwise rotation, or can be permanently installed for use as a blind rivet. Construction of the head assures one direction rotation for locking or un-locking. A quarter turn puts the initial

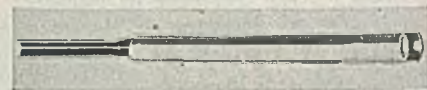


twist in the spring and another quarter turn locks the fastener in place. Spring pressure pulls the sheets together, providing a tight, vibration proof installation and high initial load without deflection,

Combustion Tube Assembly

An improved combustion tube assembly for carbon and sulphur determination in metals and other combustible materials is announced by Harry W. Dietert Co., 9330 Roselawn avenue, Detroit 4. Two lengths of cylindrical refractory tube liners are inserted within the combustion tube.

The combustion tube assembly is in-



serted within a high temperature laboratory combustion furnace tube. This center liner will protect the combustion tube from the metal and slag splatter. When the center liner becomes so full of splatter that it interferes with the boat passage, it is removed and a new liner inserted. Life of combustion tube is increased when liners are used.

Air Filtration Unit

Based on the principle of hydrostatic precipitation, Type N Roto-Clone air filtration unit is introduced by American Air Filter Co. Inc., 215 Central avenue, Louisville 8, Ky. Absence of moving parts makes it ideal for safe control of magnesium and explosive dusts, collection of linty and adhesive dusts from buffing operations and exhaust of corrosive gases.

The air is cleaned by a combination of centrifugal force and intimate intermixing of water and dust laden air. The air, forced through the sinuous passage of the stationary impeller, induces a heavy sheet

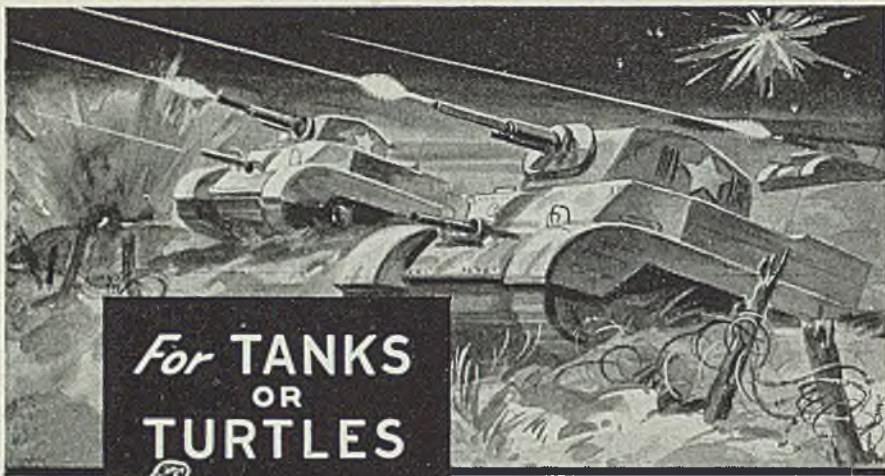


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SHEETS

*of J&L Controlled Quality Steel — insure
consistent economy and satisfaction through-
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TURTLES



"Armored Protection" is VITAL!

That's true of your plant equipment, too—especially where steel is unduly exposed to corrosion.

IngAclad Stainless-Clad Steel—product of the Ingersoll Steel Division of Borg-Warner Corporation—is mild steel "armored" with a ply of stainless steel. The two metals are so perfectly bonded into a single sheet or plate that only by looking at the edge or back of the metal can you detect that it is not solid stainless.

In operation it gives real stainless service on the side that is used, yet costs much less than the solid metal. By specifying IngAclad Stainless-Clad Steel when you add new or rehabilitate old equipment you will effectively and economically armor your plant against corrosion.

Since we are producers of Ingersoll Solid Stainless and Heat-Resisting Steels as well as IngAclad Stainless-Clad Steel, Ingersoll Engineers are in a position to make unbiased recommendations.

INGERSOLL STEEL & DISC DIVISION

BORG-WARNER CORPORATION

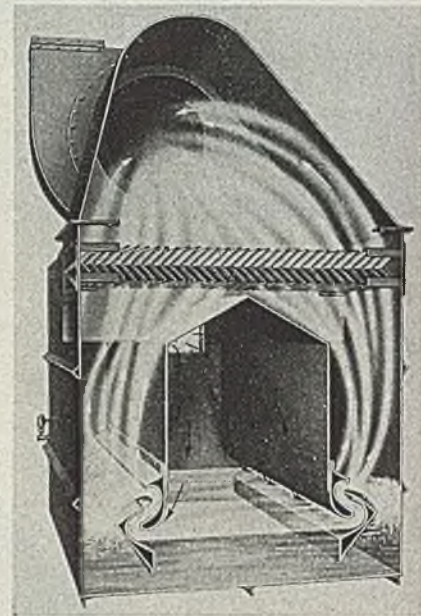
310 South Michigan Avenue • Chicago 4, Illinois

Plants: Chicago, Ill.; New Castle, Ind.; Kalamazoo, Mich.



PRODUCTS OF BORG-WARNER

of water to move along the surface of the impeller blades creating a water curtain in the form of a reverse S through which the air must penetrate. The collection efficiency is the result of the impingement of dust in water due to centrifugal action in the impeller and scrubbing

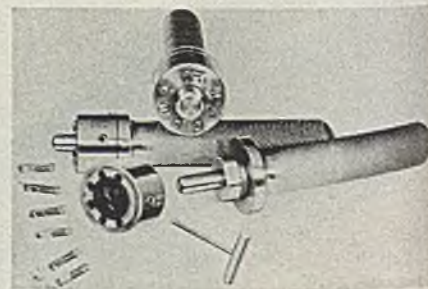


action of water curtain which permits the clean air to be returned to the work-room.

The unit is manufactured in three classes and thirteen sizes for the exhaust of air columns from 1000 to 25,000 cfm.

Hand Stamping Device

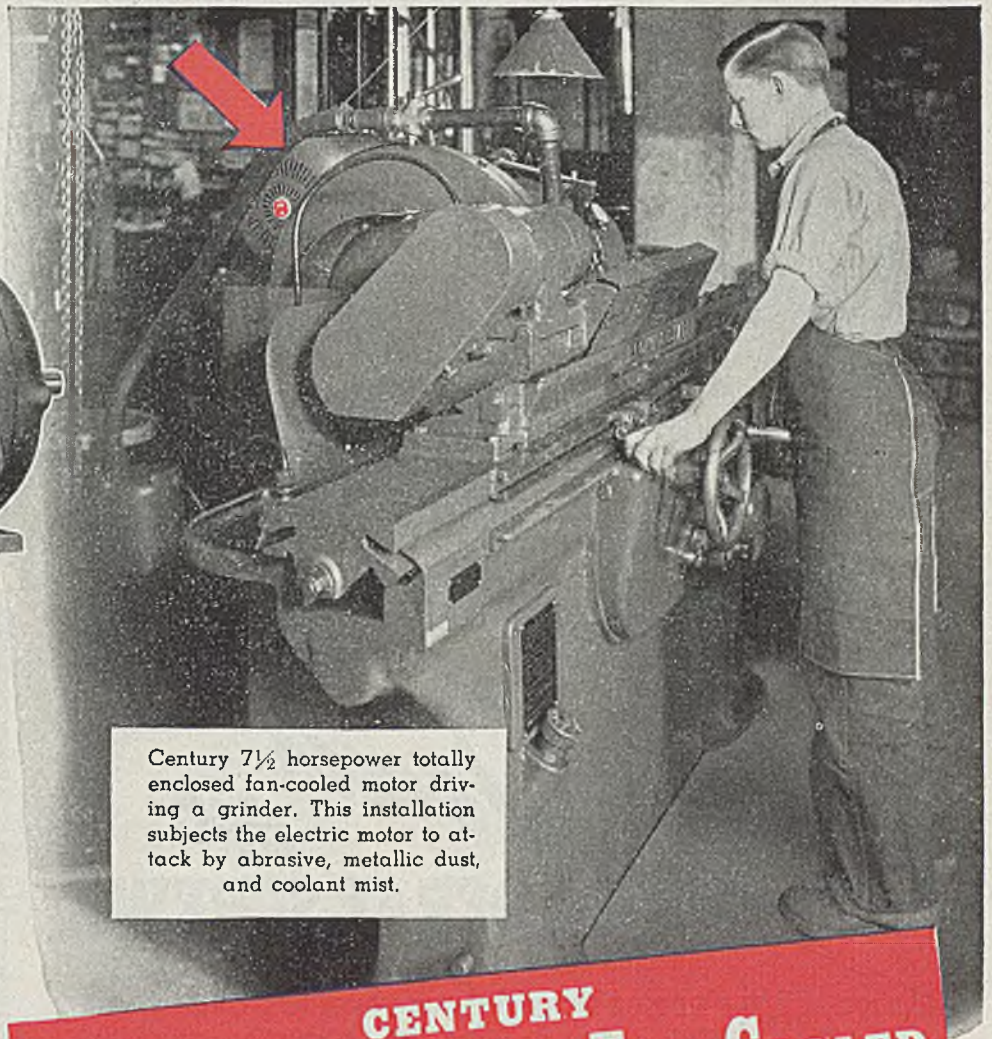
A new hand stamping device for angular marking is introduced by New Method Steel Stamps Inc., 147 Jos. Campau, Detroit 7. With this marker it is possible to use the same size type blanks and characters for all small or large flat surface radii being marked. The device also eliminates need for spacers inserted



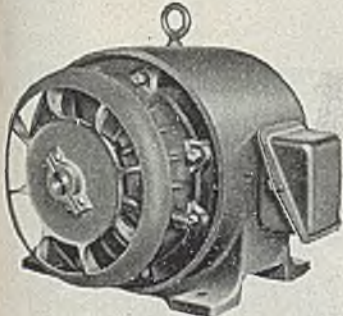
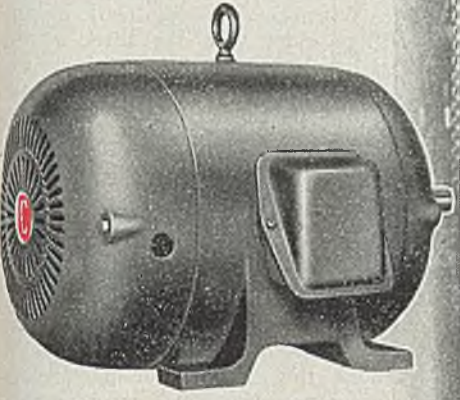
between individual type characters. An arrangement whereby a single character can be removed without disturbing the rest of the type makes it adaptable for such work as stamping dates on metal parts.

Locking device above the pilot of the type holder has a flat ground on its circumference. The type retainer, drilled to accommodate the desired number of type, carries indexing marks facilitating the loading and unloading of steel type. When changing a character, the corres-

CENTURY MOTORS
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Century 7½ horsepower totally enclosed fan-cooled motor driving a grinder. This installation subjects the electric motor to attack by abrasive, metallic dust, and coolant mist.



Century Totally Enclosed Fan Cooled Motor with the steel fan cover removed.

CENTURY
TOTALLY ENCLOSED FAN COOLED
MOTORS Mean Motor Protection
in Destructive Atmospheres



Century Totally Enclosed Fan Cooled Motor End Bracket



Century Totally Enclosed Fan Cooled Motor Frame and field winding showing the air passages.

This is true because the vital parts of the motor are isolated from cutting solution fogs, abrasive and metal dust, oil-laden factory-dust, chips, etc.

A large fan blows a blast of cooling air around the frame that seals in the windings and bearings.

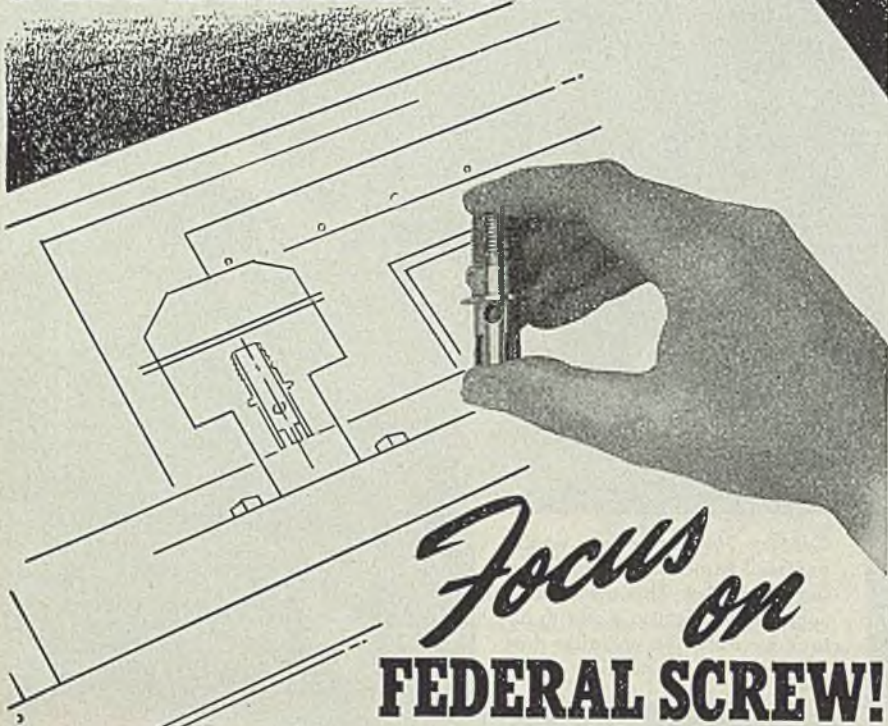
If you require that motors operate in an atmosphere containing destructive dusts, abrasives, mists, fogs, etc., be sure to call in a Century engineer to get all the facts about what Century Totally Enclosed Fan Cooled Motors can do for you.

Century motors are available from 1/20 to 600 horsepower.



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The Answer TO MANY OF YOUR RECONVERSION PROBLEMS . . .



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In planning a rapid change-over to civilian manufacture, keep in mind the production capacity at Federal Screw Works. The contract manufacture of screw machine products and cold-forged parts has been our specialty since 1919—and the added plant facilities and technical skill resulting from our war work puts us in an unexcelled position to supply many of the parts you may soon be needing.

Federal Screw Works is fully equipped to make screw machine products of all types—to perform all second-operation work, including grinding, heat treating and plating—and to produce parts by cold forging and thread rolling—in any volume desired, and to your closest specifications.

Send us the details of the parts you need. Without obligation on your part, we'll be glad to quote prices and deliveries.



Free illustrated book, "Focus on FEDERAL SCREW", shows at a glance what we can do for you. Write for a copy—on your company letterhead, please.



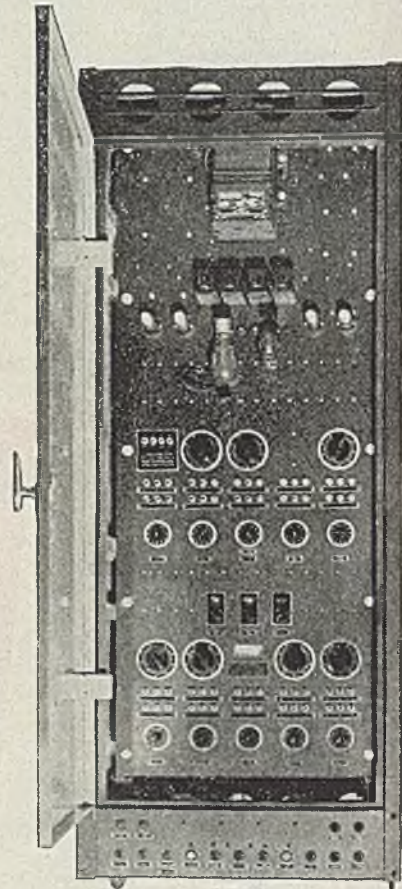
Federal SCREW WORKS

DETROIT AND CHELSEA, MICHIGAN
MAIN OFFICES: 3401 Martin Ave., Detroit 10, Michigan

ponding index mark on the type retainer should be registered with the zero mark on the anvil, allowing the character to drop out of the drilled hole and another one inserted. This is accomplished by flats on the round shanks of the type mating with the flat on the locking device. When the indexing mark on the anvil coincides with the mark at the tapped hole in the type retainer, the entire assembly can be locked in place with a single set screw.

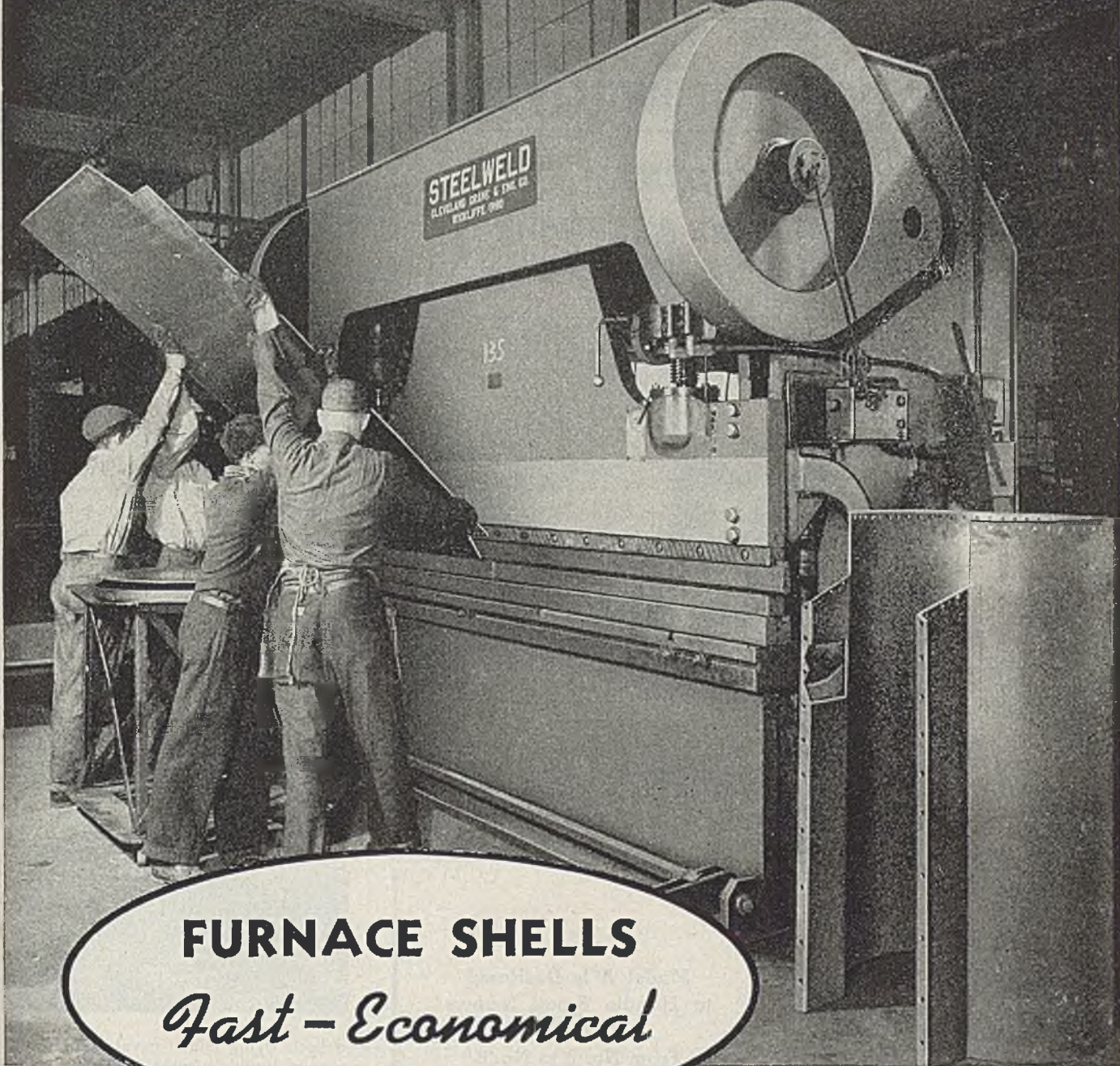
Weld and Sequence Timer

A new weld and sequence timer for providing the various time and current adjustments necessary for welding heavy sections of air-hardenable steels is announced by Industrial Control Division, General Electric Co., Schenectady, N. Y. Although this timer is designed especially for use with the company's igni-



tron contactor and a heat control panel, it can also be used in combination with most of their spot welding controls which include the phase-shift method of heat control.

Operating from 230/460/575 v, 60 cycles, the control adjusts the time of current flow and its magnitude for preheating, welding, grain refinement and tempering. Other adjustments control the time for chilling the weld nugget following the weld and grain refinement periods. For variations in control voltage of plus 10 to minus 20 per cent, consistency of timing will be within plus or minus 1/2 of 1 per cent of the time setting. However, it is recommended that the company's current regulating compensator be used with this combina-



FURNACE SHELLS
Fast - Economical

Thousands of furnace shells similar to one above have been multi-punched and braked on this Steelweld.

30 rivet holes are gang-punched per stroke in 3/16-inch plate with the Steelweld Press above in the production of shells for "Torrid Zone" warm air steel furnaces at the Lennox Furnace Co., Syracuse, N. Y. Bending and flanging operations are also performed with the machine. Recently this press played an important role in the fabrication of aircraft landing mats.

The press, as illustrated, is set up for two braking operations. The left side of the machine is used for flanging the plate and the right side for braking next to the cylindrical section. Back stops make it easy to produce accurate bends quickly.

The factory manager of Lennox Furnace declares this Steelweld: "A very good machine that is kept busy with all of our braking work."



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CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

1125 EAST 283RD STREET • WICKLIFFE, OHIO.

STEELWELD
BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

Production Screwdrivers

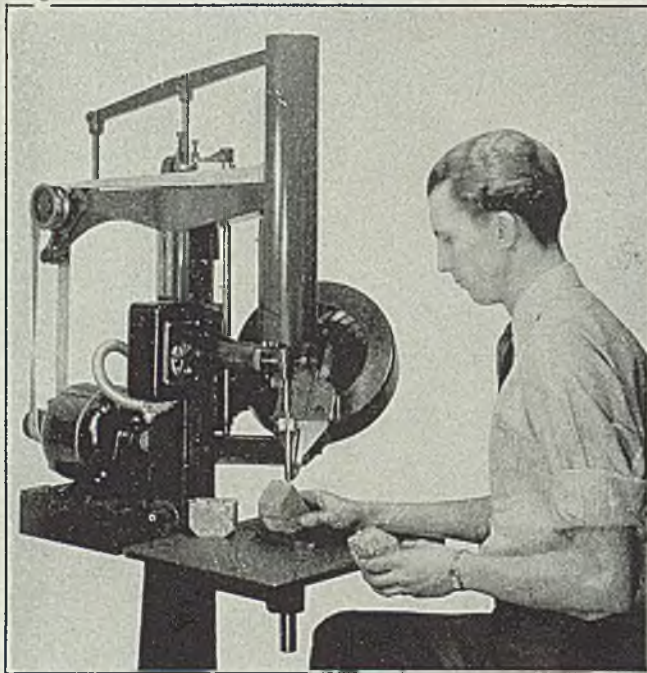
Speed up

**YOUR SCREWDRIVING ASSEMBLIES
BY USING THESE MACHINES**

Model B
Will Drive
Screws From
No. 6 to
No. 1/4,
in Lengths
3/16 to 1 1/2
Inches

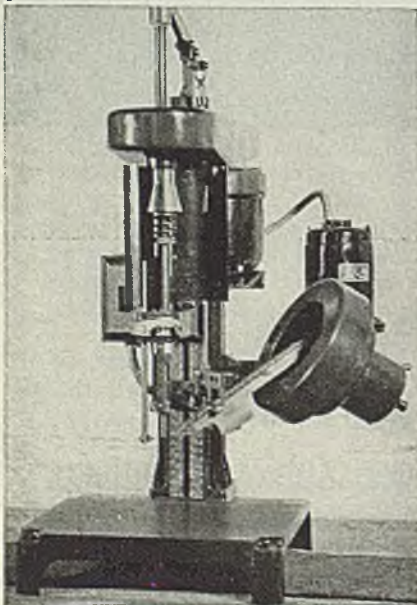
All Screws
Driven to
a Uniform
Tension

No Marring
of Heads



MODEL B

MODEL A



Model A Is Designed
to Handle Small Screws
in Sizes
From No. 2 to No. 6
In Lengths
From 3/16" to 3/4".

Driving Time
One Second Per Screw

Send Sample Assemblies
for Production Estimates
and Quotations

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Detroit Power Screwdriver Co.

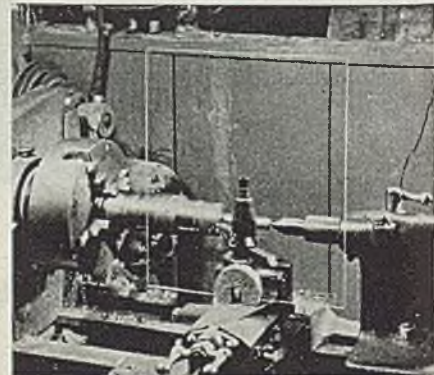
2813 W. Fort St., Detroit 16, Mich.

tion to correct for variations in welding current caused by line voltage variation or the introduction of magnetic materials into the throat of the welding machine.

This control consists of nine time intervals, seven independent heat adjusters, two pressure interval timers, one squeeze timer, one hold timer and provisions for a two-stage foot switch, all housed in a steel enclosure. Control adjustments are accessible on the front of the panel and each timer has a separate time adjustment and an indicating light. The heat control potentiometers have large graduated dials which enable accurate heat settings. A minimum number of tubes are used to give the multiplicity of operations required.

Safety Device

Known as magnetic Grip-Shield, a new safety device to eliminate the necessity of goggles and face shields in many machine tool operations is introduced by Dille Mfg. Co., 10128 Euclid avenue, Cleveland 6. It consists of thick transparent sheets of plastic anchored into a horseshoe permanent magnet. The magnet in the base of the shield holds it in position, but with a slight twist, it may be moved to suit operating conditions. It



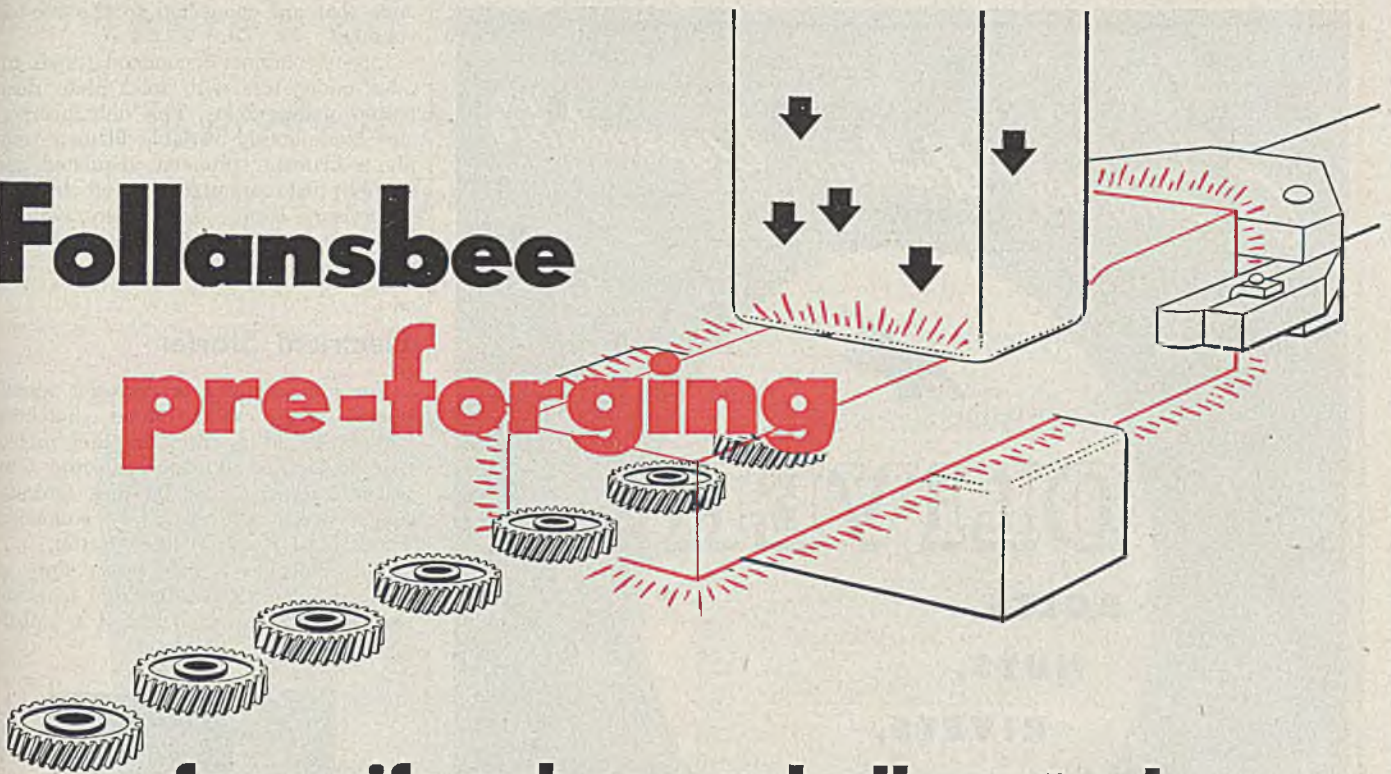
deflects flying chips, metal dust, sparks, oil and liquids to protect machine operators without obstructing vision. Used on all types of machinery such as lathes, grinders, drill presses, milling machines, buffing and sanding machines, or for wood-working machines such as band saw, joiner, planer, jig saw and other types. Sizes range from 4 x 3 in. to 10 x 8 in., and a hood type is also available.

Test Unit

Green Electric Co., 130 Cedar street, New York 6, announces a life-test unit for electronic tubes. The equipment comprises two complimentary units, the plate supply rectifier and the life test cabinet. Up to 1 1/4 amp at potentials up to 2000 v for plate supply to the tubes under test are provided by the smaller unit, the plate rectifier. Plate supply rectifier is 3 phase operated and built to include a filter, continuously variable voltage control, time delay relay, door interlock safety switches, supervisory lamps, voltmeter, ammeter and interlock cir-

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pre-forging



for uniformly sound alloy steels

If your products can be improved by alloy steels of uniform soundness . . . if your production losses can be reduced by cutting rejects due to faulty steel . . . Follansbee Pre-Forged Alloy Steels merit your consideration.

Follansbee ingots are first forged—then rolled—into blooms or billets. This exclusive process exerts a kneading action to the very center of the ingot, imparting a uniform density and grain structure which is preserved in subsequent working operations. Follansbee Pre-Forged Alloy Steels have proved their worth in countless products requiring the finest of steels—such as transmission gears and axles for heavy trucks and bulldozers, landing struts and propeller hubs for giant aircraft. They can be relied upon to meet the highest standards, *shipment after shipment*.

You are invited to test Follansbee Pre-Forged Alloy Steels in your products. Write, wire or telephone the General Offices or the nearest District Sales Office or Agency.

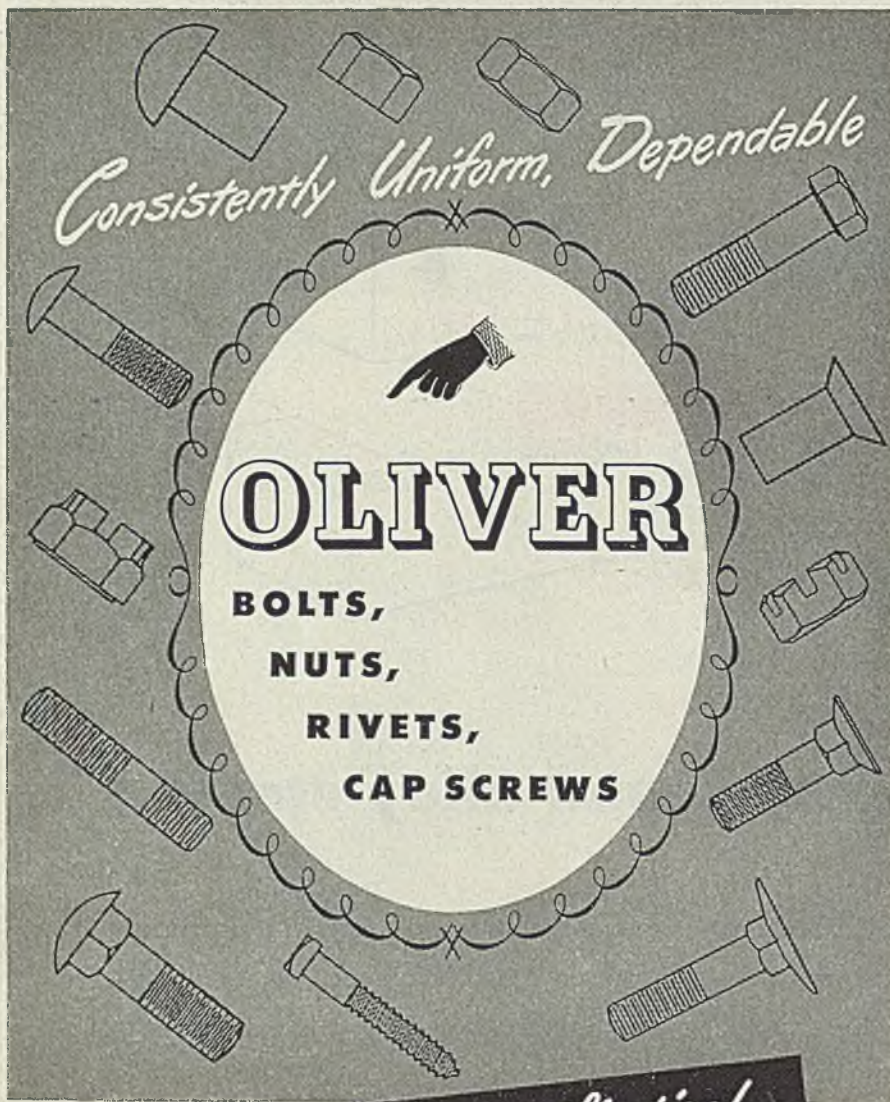


FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES • PITTSBURGH 30, PA.

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, Houston, St. Louis, Nashville, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va. and Toronto, O.

ALLOY BLOOMS & BILLETS, SHEETS & STRIP • CLAD METALS • COLD ROLLED CARBON SHEETS & STRIP
POLISHED BLUE SHEETS • ELECTRICAL SHEETS & STRIP • SEAMLESS TERNE ROLL ROOFING



your best specification!

Experience teaches us to depend upon past performance and known qualities in specifying important fabrication items. Therefore, you make no mistake when you select OLIVER Bolts, Nuts, Rivets, Cap Screws and other industrial fasteners.

Being one of the largest and oldest firms in the industry, Oliver has the equipment and the skill to produce uniformly accurate, high quality fasteners with heads and shanks true to size, threads clean and accurate. For severe service or highly precise work, Oliver supplies fasteners that meet your most exacting requirements.

Let the nearest Oliver district specialist help you with your fastening problems.

OLIVER
IRON AND STEEL
Corporation

SOUTH 10th and MURIEL STREETS · PITTSBURGH 3, PA.

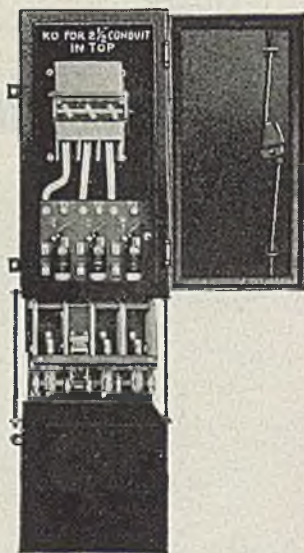
cuits that are connected to the life-test cabinet.

Life-test cabinet accommodates six triodes under test with total plate dissipation of over 2 kw. This unit incorporates continuously variable filament supply, a filament voltmeter, regulated grid supply, plate ammeter, circuit breaker, supervisory lamps, door safety switches and interlock circuits associated with plate supply rectifier.

Electrical Starter

For use in dusty or corrosive atmospheres where short circuit protection without requiring fuses or other protective devices is necessary, Electric Controller & Mfg. Co., 2700 East Seventy-ninth street, Cleveland 4, announces Type LZS-HR combination starter.

This unit has 3 pole heavy duty oil immersed contactor, adjustable magnetic overload relays in each line of a 3 phase



circuit and disconnect switch with externally operated handle. Of high arcing capacity, this starter eliminates the fuse or other protective devices subject to high maintenance in corrosive atmospheres. It is rated at 50 hp, 220 v and 100 hp at 440 or 550 v. Rupturing capacity is 10,000 amp. Separately mounted push buttons are available to provide either low voltage protection or low voltage release.

Automatic Pump

A 3-in. stroke, 20 hp unit has been added to the line of Aldrich-Groff controllable capacity pumps manufactured by Aldrich Pump Co., Allentown, Pa. Primarily used for boiler feeding, desuperheater feeding, pipe line, process charging and proportioning, these pumps are being installed wherever accurate, automatic control of delivery is important. Operated at constant speed, from no-load to full rated capacity, power consumption of the units is practically proportional to discharge.

There's an improvement

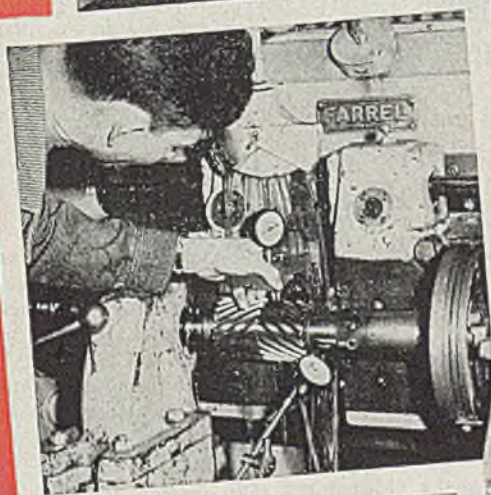
in production, tool life, and finish

*when the proper **Gulf Cutting Oil** is used!*



Aircraft Supercharger Impellers

Gulf Cut-Aid proved superior to twelve other brands of cutting oil tested in this plant for straddle milling aluminum alloy supercharger impellers. With this revolutionary new cutting oil, production is 10% greater and tool life 50% longer than with cutting oil previously used.



Helical Gears

The use of Gulf Cutting Oils on this gear generator led to a 20% increase in cutting speed, 25% greater tool life, and improved production.



Shell Adapter Rings

When the proper Gulf Cutting Oil was put in service on this big automatic, rejects were reduced to a negligible percentage, tool life was greatly increased, and bearing trouble was eliminated.

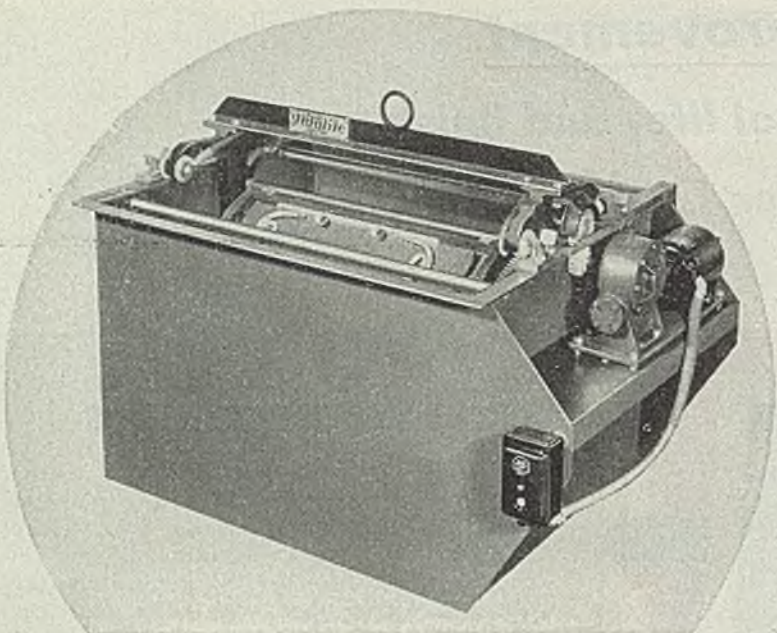
A GAIN AND AGAIN, on the most exacting war assignments, Gulf Cutting Oils have made outstanding improvements in production and tool life. Call in a Gulf Service Engineer today and let him show you how they can help you with *your* machining problems. Write, wire, or phone your nearest Gulf office.

GULF OIL CORPORATION • GULF REFINING COMPANY

Division Sales Offices:

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UDYLITE PLATING BARRELS

RECOMMENDED TO YOU BY THEIR
FINE RECORD OF PERFORMANCE

● UDYLITE barrels are built to do a uniformly GOOD plating job year after year with a minimum of replacement and repair. Carrying loads of 150 to 200 lbs., service records of 18 to 24 months continuous use without breakdown or replacement are not unusual.

These barrels are available in a range of standard sizes, for alkaline or acid solutions. A complete line of well engineered supplementary equipment (as illustrated) make this barrel set-up most practical and efficient.

Operation in your own plant will show you that UDYLITE barrels last longer and produce consistently superior plating, with far less maintenance.

Complete specifications and details upon request.



Plating cylinder.



Double chute perforated rinse.



Loading stand with hopper.



Hopper type, rinse unit.



Transfer stand.



Cylinder, cleaning unit.

THE UDYLITE CORPORATION

1651 EAST GRAND BOULEVARD • DETROIT 11, MICHIGAN
REPRESENTATIVES IN ALL PRINCIPAL CITIES

Cutting Outfit

(Concluded from Page 107)

control conditions necessitated the development of special pre-set gas regulators to assure proper flow of oxygen and acetylene to the torch. Gas regulators are small and of a compact lightweight design to reduce the overall dimension and weight of the complete outfit. Specifications developed by the Bureau require manufacturers to produce pre-set delivery pressure 2-stage oxygen regulators and similar pre-set delivery pressure single stage acetylene regulators. Strict service tests for these regulators assure safe and economical delivery of gases.

To assist inexperienced operators, a brief but complete instruction chart is permanently attached to the inside cover of the main stowage cabinet, as shown in Fig. 2. This chart has an illustration and sequence description for inexperienced personnel. Supplementing the instruction chart is an illustrated manual detailing operation of the equipment, safety instructions and spare cylinder replacement.

Complete outfits of pack type equipment and spares are being supplied as rapidly as possible to all combat ships and to many auxiliaries. The apparatus ultimately will become an essential item of every United States ship's allowance list, making obsolete older oxyacetylene equipment.

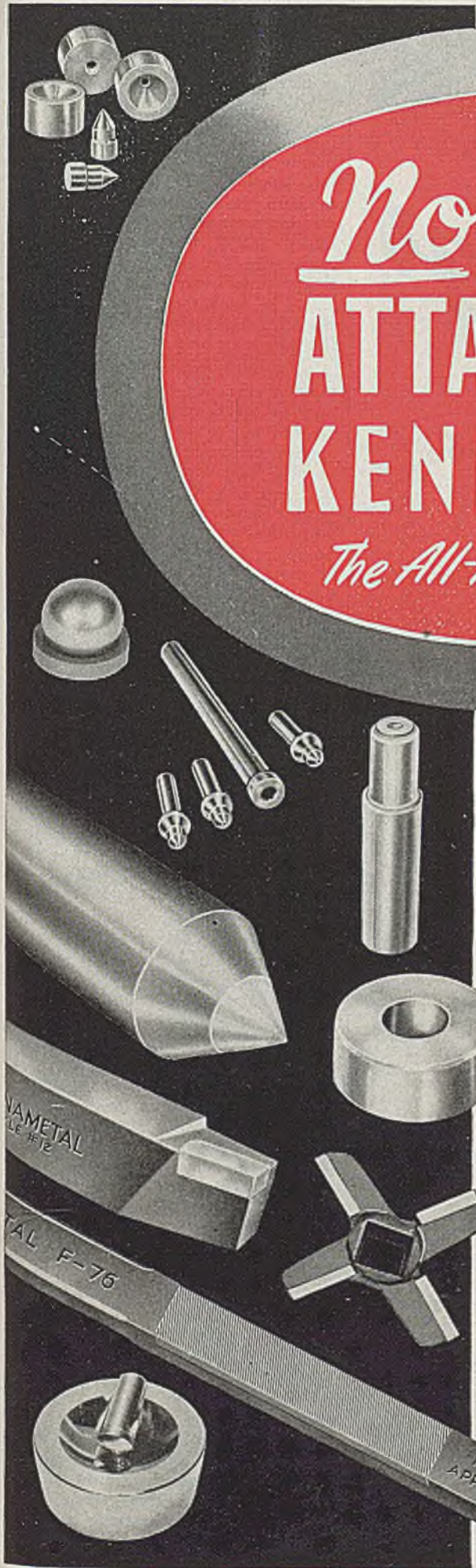
Airtight Vertical Lift Door Developed

An airtight vertical lift door has been developed and built by Kinnear Mfg. Co., Columbus, O., for the Unconventional Power Plant Laboratory of the Air Technical Service Command, Wright Field, Dayton. Its basic operation principle is similar to many of the company's rolling or upward opening types of doors, but it also incorporates many features with practical value for applications where a special type of door is required.

Door is spring counterbalanced (no weights required) and motor operated. Airtightness, when door is closed, is accomplished by means of air inflated rubber tubes. Inflation of sealing tubes is controlled by valves working in conjunction with motor operating mechanism, which in turn is controlled by properly labeled push buttons.

Door can be raised or lowered for regular service purposes without putting air-sealing mechanism into operation. Mechanism is interlocked so that, should door be closed and sealed, the motor operator will not start door upward until air-seals have been automatically deflated.

To lower door from raised position and seal it airtight, it is necessary only to depress a push button marked "closed" and, when door is closed, momentarily depress button marked "pressure." Door also is provided with a blow-out panel in case of explosion.



No STRINGS ATTACHED TO KENNAMETAL

The All-American Carbide

When you purchase and pay for Kennametal, *our proprietorship in it ends*. It is yours, to do with as you wish. You may use this tough, hard cemented carbide as the keen, durable cutting edge of economy-promoting tools, or insert it at critical points of a machine to minimize the effect of abrasive wear—*without entering into complicated agreements*.

If the use of Kennametal helps you perfect an invention—*the rights to that invention, insofar as we are concerned, are completely yours*. If the invention is patentable, we neither ask, nor want, an interest in your patent merely because Kennametal is a key component.

We have encouraged, and will continue to encourage, uninhibited use of Kennametal. The products shown on this page illustrate a few typical applications. The resourcefulness of America's designers and inventors will constantly bring forth new devices in which the incorporation of Kennametal is indispensable to provide wear-resistance up to 100 times that of steel.

To these creative people, in whose minds the material progress of society first takes form and substance, we extend the fullest cooperation of our engineering and metallurgical staffs, and the reassurance that—*"There are no strings attached to Kennametal."*



KENNAMETAL
SUPERIOR CEMENTED CARBIDES
KENNAMETAL Inc., LATROBE, PA.

Sizes up to 2" diameter
— in a tin bronze, a
high-lead bronze, and
SAE 660 bearing bronze



As a part of Ampco's program to provide American industry with a *complete service* on copper-base alloy parts, the continuous-casting process has been applied to the production of mill-length rods of certain bronze alloys.

This process, exclusive with Ampco as to bronzes, results in rods of close tolerance and a soundness not commercially available until now. The fine, even dispersal of the secondary constituents is truly remarkable. The rods are of good surface, uniform diameter, and even length.

Fast semi-automatic or fully auto-

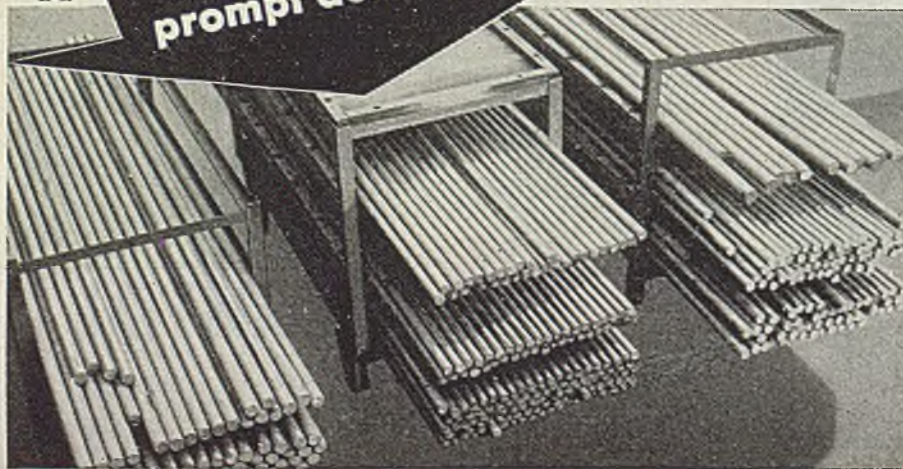
matic machines can be used, with big savings in time, manpower, and money. Tools last longer, with a sand-free surface and no internal segregation. There is less material to purchase, receive, and handle. Scrap loss due to metal faults is practically eliminated — with further savings on the handling and storing of scrap accumulations.

Write for Data Sheet 131, showing photomicrographs and properties. *Ampco Metal, Inc., Dept. S-6, Milwaukee 4, Wis. Ampco Field Offices in Principal Cities.*

Ampcolloys are a product of
Ampco Metal, Inc.

... specialists in engineering — production — finishing of copper-base alloy parts.

**Bars in Stock
for
prompt delivery**



Gas Immersion Tubes

(Continued from Page 110)

or back pressure to the atmosphere.

With sealed-in pressure type burners, there seems to be no reasonable limit to the amount of gas which can be completely burned. For example, with a tube length of over 40 ft it was possible to burn gas completely at an input rate in excess of 80,000 Btu per hr per square inch of cross-sectional tube area. Apparently, the only limitation to combustion rates with this type of burner would be established when frictional resistance exceeded the power output of the premixing unit.

As in other methods of gas heating, thermal efficiency characteristics of immersion tubes are improved by maintaining excess air at the minimum amount consistent with complete combustion. Extent to which excess air can be decreased without impairing combustion depends on burner design. It is particularly important from a combustion standpoint that secondary air in the case of atmospheric burners be directed into the tube near the base of the flame.

Effect of Excess Air

Effect of excess air is illustrated by the relationship between concentration of carbon dioxide in flue gases and thermal efficiency of a 4-in. immersion tube shown in Fig. 4. From this it is apparent that any comparative tests on various sizes of immersion tubes is contingent on maintenance of a fixed concentration of carbon dioxide. For this reason the percentage of carbon dioxide was maintained at 10 per cent during all tests (equivalent to 20 per cent excess air). This particular value was arbitrarily chosen to attain a reasonably high thermal efficiency and to provide sufficient excess air for complete combustion over a wide range of input ratings.

Data obtained on various tube diameters indicated that, for heat transfer purposes, return bends and 90° elbows were equivalent to 1.1 ft of straight pipe plus the length of the fitting along its centerline in feet. Since use of such fittings was found to increase frictional resistance to flow of flue gases considerably more than the rate of heat transfer, it would seem preferable, if space limitations permit, to increase the length of immersion tube for additional heat output.

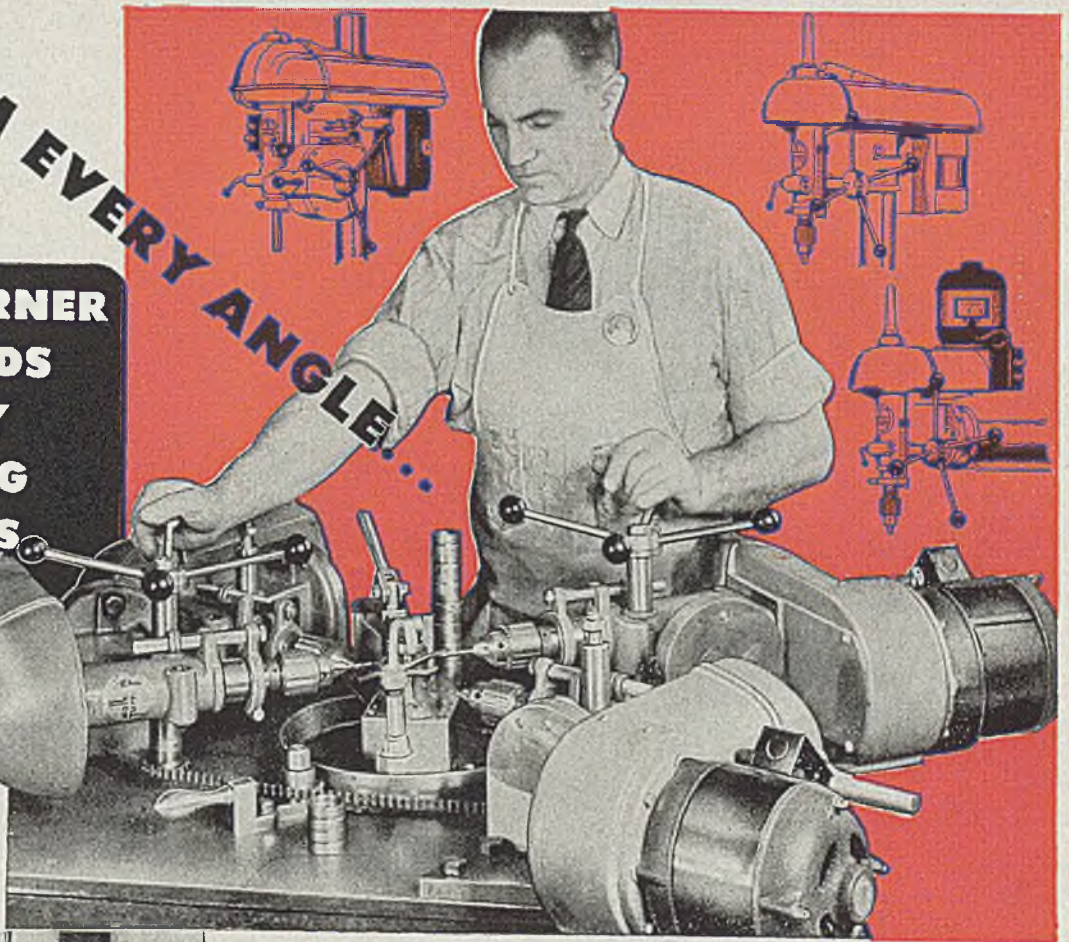
Baffles are seldom, if ever, used in immersion tubes of any appreciable size. Extended heating surfaces on the outside of a tube, obviously, would serve no practical purpose for many applications since the rate of heat transfer from the flue gases to tube wall is extremely small in comparison to the heat transfer from the metal to water or most other liquids in which the tube may be immersed. If extremely viscous fluids, such as oils, are being heated externally, extended fins may be of some value. Simplicity of immersion tubes as

A-15

FROM EVERY ANGLE

**WALKER-TURNER
DRILL HEADS
SIMPLIFY
RETOOLING
PROBLEMS**

Four Radial Drill Heads mounted horizontally are used by S.K.F. Industries to drill two opposed holes in bearing races. The drill spindles are interconnected and operated simultaneously, completing two bushings in one operation.



Check These High Spots:

- ⊗ Operate vertically, horizontally, at any angle — even upside down.
- ⊗ Careful selection of materials, superior design, rugged construction, assure long service at high level of precision.
- ⊗ Speed ranges from 85 to 8300 R.P.M.
- ⊗ Safe, simplified operation.
- ⊗ Low initial cost—low power consumption—low maintenance.
- ⊗ Handle Metals, Plastics, Wood, Ceramics, Glass.

For a faster reconversion when the time arrives, it will pay you to look into the tooling possibilities of Walker-Turner Drill Heads, now!

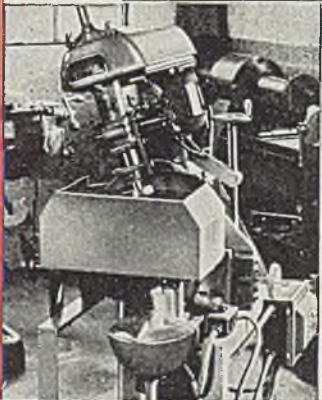
Compact, flexible Walker-Turner Drill Heads are available in 20" models (hand or power feed) and 15" models (hand feed or radial). Four ball bearings on splined spindles—full floating spindle pulley — one-piece head casting—many other features—maintain high production and precision, while slashing costs!

WRITE TODAY FOR FREE, FACTUAL DRILL HEAD FOLDER — shows typical special tooling set-ups — construction details — cutaway drawings — prices.

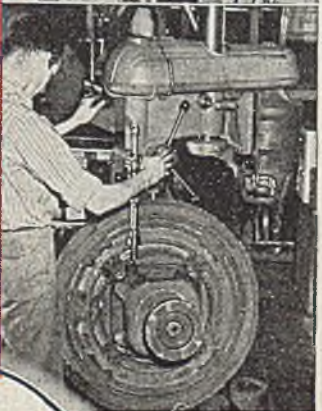
WALKER-TURNER CO., INC., PLAINFIELD, N. J.



Two Radial Drill Heads working in conjunction to rough grind lens blanks to specified curvature.



20" Drill Head converted to a highly efficient Jib Drill does the work of a 12 foot radial.



MACHINE TOOLS

DRILL PRESSES — HAND AND POWER FEED • RADIAL DRILLS
METAL-CUTTING BAND SAWS • POLISHING LATHES • FLEXIBLE SHAFT MACHINES
RADIAL CUT-OFF MACHINES FOR METAL • MOTORS • BELT & DISC SURFACERS

**HANDLING+Processing+HANDLING+Assembling+HANDLING
+ Packing+HANDLING+Storage+HANDLING**

HANDLING—the Common Denominator of PRODUCTION



LET MEN DIRECT POWER—NOT GENERATE IT!



Lower unit costs, made possible through modern mass production methods, increase the necessity for a modern, efficient handling system. Manual handling of low cost units is especially expensive and wasteful and can offset the economies of effective production methods.

Towmotor, *the one-man-gang*, brings mass production efficiency to handling, maintaining the profit margin on products of low unit cost. The Towmotor DATA FILE gives complete details . . . write today for your copy.



TOWMOTOR

THE ONE-MAN-GANG

TOWMOTOR CORPORATION • 1223 E. 152ND STREET, CLEVELAND 10, OHIO

heat exchangers and the ease with which additional heating surface may be obtained in a majority of cases by recourse to additional pipe length would in most installations make it impractical and unnecessary to employ baffles within the immersion tube. However, where the length of the tube is limited, baffles could be used to increase efficiency and output as illustrated by results obtained on 2 and 2½-in. IPS tubes with pipe baffles as shown in Fig. 5. These show an increase in thermal efficiency of from 5 to 6 per cent with comparatively small restriction of the cross-sectional area of the tubes. Heat transfer obtained with the baffled tubes of 5.5 and 8.54 ft lengths was equivalent to that obtainable with 7.24 and 13.2 ft long tubes without baffles (calculated from equation 1).


As a matter of interest, comparative pressure drops were determined on the baffled 2-in. diameter 5.5 ft long tube and an unbaffled tube 7.24 ft long having the same thermal efficiency at the same input rates. These studies were conducted over a wide range of air throughputs from 10,000 to 29,000 cubic ft per hr. The pressure drop through the short baffled tube was 20 per cent higher than through the longer unbaffled tube. This definitely points to the advisability of using additional tube length in preference to baffles when greater heat transfer is desired since the friction loss through the unbaffled pipe is appreciably less and therefore would permit a higher gas input rating with atmospheric or open pressure type burners.

Units Are Flexible

One of the principal advantages of gaseous fuel is its flexibility of operation over a wide range of input rates. This characteristic is particularly valuable in immersion tube heating which may be required at times to provide greatly increased inputs to meet special demands. An enormous increase in input rates can be made with a relatively small decrease in efficiency. This is illustrated by the data presented in Table III.

As will be noted, an average increase in heat output of nearly 170 per cent can be effected with a decrease in thermal efficiency of from 80 to 70 per cent.

In analyzing these data it should be borne in mind that emphasis is given to heat transfer characteristics of the tube. An important collateral consideration is that capacity of the tube and burner must, of course, be designed to accommodate the desired gas rate with complete combustion. In the event it is considered probable that an installation may at some time in the future be called on to provide greater heat output than the original design value, it may be advisable to select a tube diameter and a burner capacity larger than that calculated. Thus, if such a contingency actually materialized, increased gas inputs could be applied with complete combustion.

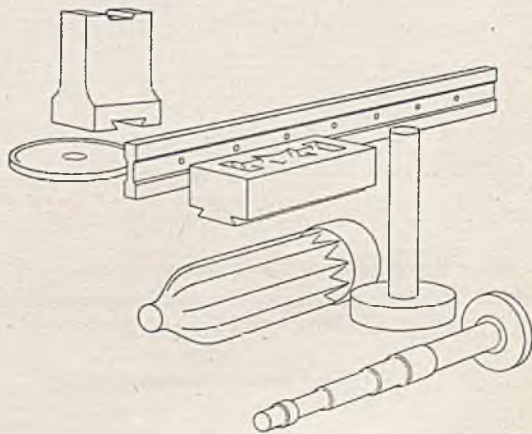


Heppenstall: the most dependable name in forgings

In charting your course of future business, it's well to remember that Heppenstall Forgings have a time-proved record for extra service . . . Dollar for dollar they'll cost you less to use—Heppenstall guarantees it . . . Heppenstall Co., Pittsburgh, Pa.

Your personal war effort is important!

PUSH PRODUCTION • PUSH BOND SALES





dust hurts equipment, too!

Dust, uncontrolled in your plant, is many times more harmful to your equipment and production than it is to the human eye. Why doctor dust-damaged equipment when the cause of the damage can be checked at its source? An American Dustube engineer can quickly show you how to eliminate the costly penalties dust inflicts. He can quickly show how American Dustube Collectors efficiently trap and effect its safe, easy disposal. There is an American Dustube dust collector of a size and type to handle the dust problem that exists in your plant. The last word in improved design, Dustube offers you many advantages through efficient operation, easy installation and inspection. Fewer working parts create a minimum of maintenance.

**AMERICAN
FOUNDRY EQUIPMENT CO.**
509 South Byrkit Street
Mishawaka, Indiana



AMERICAN



dustube
dust collectors

Improper shakeout is a prime reason for dust collector failure. The diagram "A" demonstrates the efficient Dustube shakeout method. Tubes are limp and deflated, completely subject to the shaking action. Dust is not precipitated on other filters, but is deposited directly into the hopper below. With Dustubes, shakeout periods are shorter and less frequent . . . filter tube wear is decreased.

Figure "B". Dustube Collectors filter air at a rate from 270 CFM to 47,000 CFM and more, depending on the dust problem. Proved collection efficiency by weight is 98% or more.

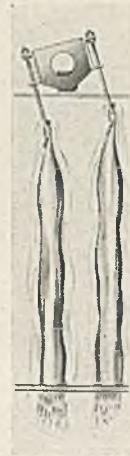


Figure A

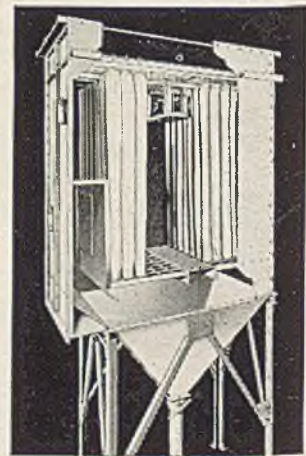
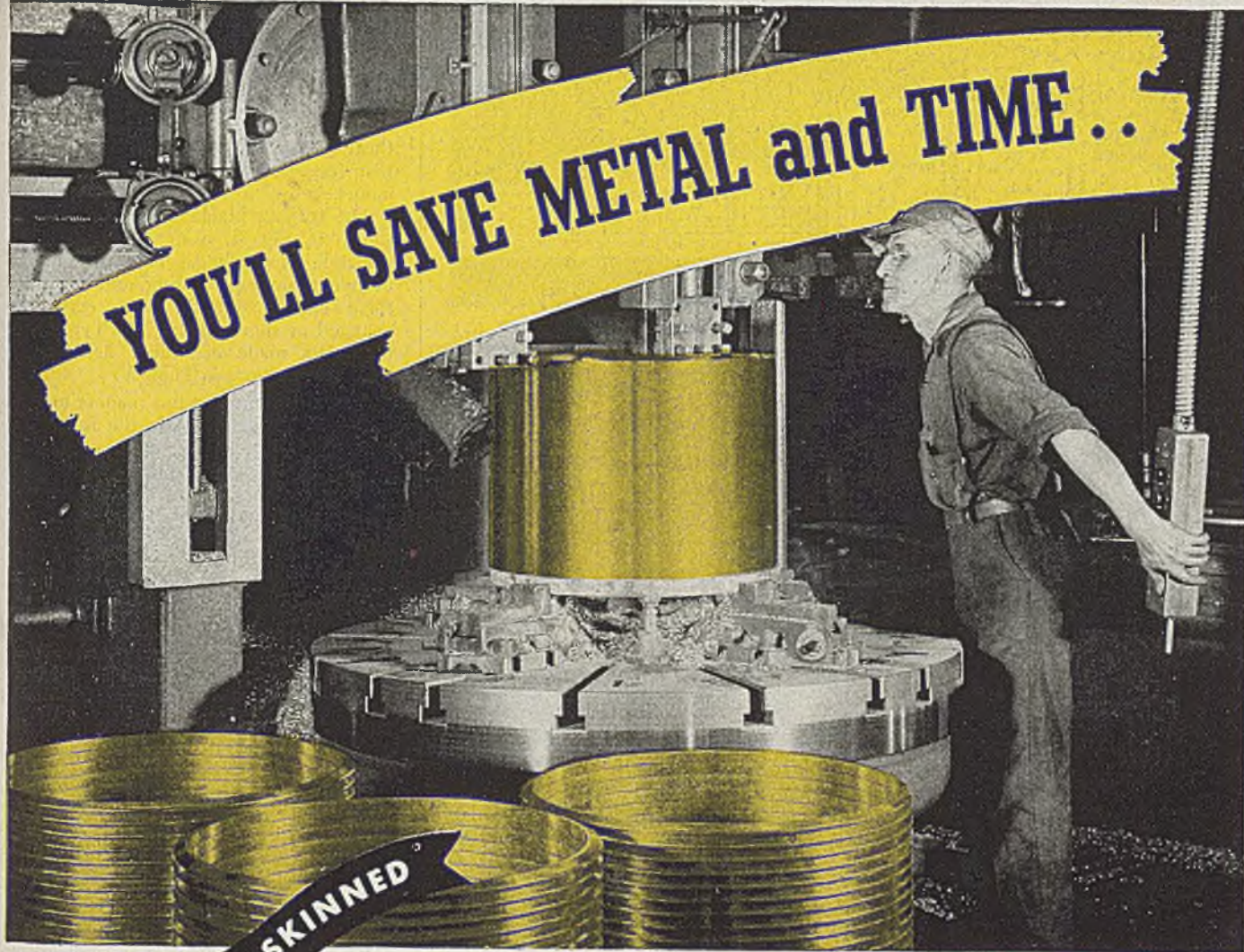


Figure B



YOU'LL SAVE METAL and TIME..

THIN-SKINNED

with Centrifugal Castings by Shenango-Penn

"SHENANGO-PENN" ALLOYS - FERROUS AND NON-FERROUS

Write for this FREE Data Bulletin!



**SHENANGO
- PENN**



BECAUSE Shenango-Penn tubular castings can be finished with a surprisingly thin cut, they are rightly called "thin-skinned". Naturally this means a minimum of waste metal and a saving in machining time—advantages that have proved invaluable to today's wartime production, and no less attractive for the peacetime picture ahead.

For example, as a result of Shenango-Penn's centrifugal process, impurities accumulate at the inside surface of castings where they are quickly and easily removed. Moreover, the castings are accurately concentric and can be controlled to precise dimensions. So savings in time and metal are bound to materialize, either in your own shop or to your equal advantage if you choose to have machining done by Shenango-Penn whose modern machine tools are available for all kinds of precision machining and finishing.

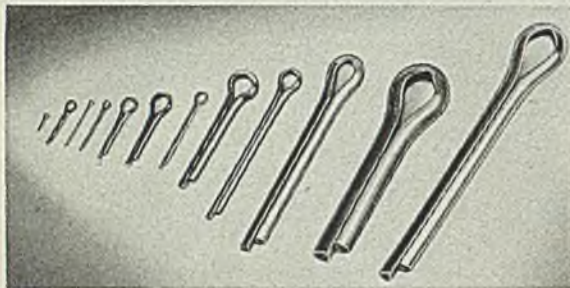
Such savings are not the only advantages of Shenango-Penn castings. You'll find the complete story in free bulletin 143, with full data.

SHENANGO-PENN MOLD COMPANY
556 West Third Street, Dover, Ohio • Executive Offices: Pittsburgh, Pa.

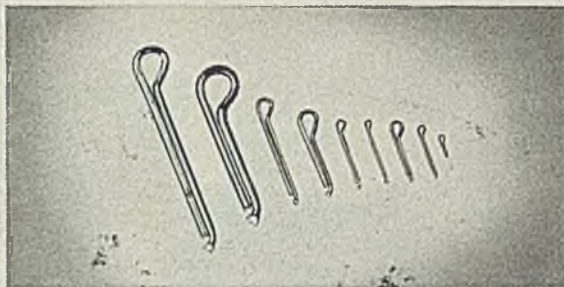
**ALL BRONZES • MONEL
METAL • ALLOY IRONS**



PACKED IN SUBSTANTIAL BOXES—PLAINLY LABELED AND NUMBERED



ACCO—
REGULAR TYPE



CAMPBELL—
HAMMERLOCK TYPE

Acco and Campbell Cotter Pins

• Acco and Campbell Cotter Pins are doing a first-rate job for many essential industries.

We draw our own wire for these good cotter pins to assure uniformity. Their shanks are parallel—and they close all the way to the shoulder. Users sometimes say a blind man could insert these pins.

Other good features: easy, positive locking—quick removal—cleaned by tumbling—packed in substantial boxes with clear, legible labels and numbers.

In addition to regular materials, both types are available in Monel, stainless steel, brass and bronze. Steel cotter pins may be had in electro-galvanized, cadmium plated and coppered finishes.

ACCO

York, Pa., Boston, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Bridgeport, Conn.



**AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE**

In Business for Your Safety

Steels Compared

(Continued from Page 116)

the finished forging, except that it was oversize in the vertical dimension (as forged) and a tong hold was added. Castings made from this pattern were then forged in the same die block as the model.

The forging blanks were first cast as shown in Fig. 4, using the blind riser principle of feeding. This was found to give an unsound casting, and to obtain some entirely sound, the risers were changed as shown in Fig. 5. Typical of the heats made are those listed with their compositions in Table V.

Heat No. 0 was cast in a manner to give an unsound casting while the rest were cast sound. The slight amount of forging given these castings tended to close up the shrinkage cavities. The result of the experiments showed that a sound forging blank is desirable.

One cast and one cast-and-forged specimen from each of Heat Nos. 1, 2, and 4 were heat treated as follows:

1850° F — 4 hr — air cooled
1650° F — 2 hr — water quenched
950° F — 6 hr — air cooled.

This left them with a hardness of 331 to 341 brinell. Standard 0.505-in. tensile bars were machined eccentrically from the longitudinally cylindrical sections of specimens from Heats 1 and 2, and half-size bars from the same location in Heat No. 4 which had been split for macroetching. Half-size bars were machined from the end sections and standard key-hole notch Charpy bars from both sections.

The data from these bars indicate a small general improvement in the mechanical properties as a result of forging. There was a marked improvement in soundness, but it seemed clear that this improvement could not be relied upon to eliminate defects in unsound castings.

Some pertinent data were obtained while those cast blanks were being forged. The regular forgings were made from 2½-in. sound rolled steel. This stock was sawed into 9-in. long forging blanks. The blanks were heated, and the tong hold forged on as the first operation. After reheating, the forging was completed with a few blows.

A time study showed the following comparison: To saw three blanks from the rolled stock required 20 min on a high speed saw or 30 min on a low speed saw. This is at the rate of 9 per hr or 6 per hr, respectively. Thirty-five blanks are charged to the furnace and require 7 min to heat to 1800° F. It requires 6 min to forge the tong holds on these 35 pieces, after which they are put back in the furnace. By the time the tong hold is forged on the last one, the first is ready for the final forging. It then requires 10 min to finish the forging on the 35 parts. It requires 8 minutes to heat 35 cast blanks to 1900° F, and they can be finish forged in 4 2/3 min.

If only the forging time of one man and one hammer is considered, forgings from rolled stock can be made at the

Aluminum

MEETS THESE REQUIREMENTS for electronic equipment:

Light weight with sturdiness is necessary, whether the device is carried in a plane or by ground troops.

Corrosion resistance provided by Alcoa Aluminum Alloys assures greater dependability under battle conditions.

Electrical properties of aluminum—high conductivity, non-magnetic, nonsparking—suit it for electronic purposes.

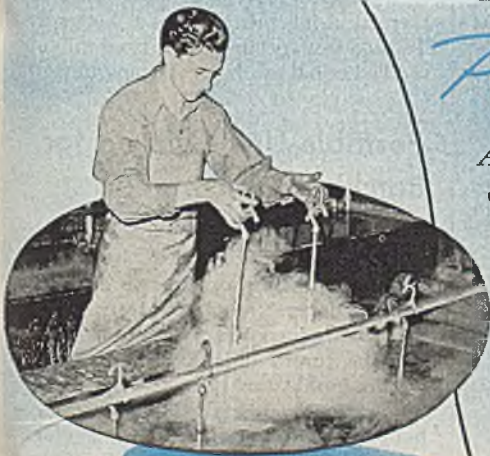
Electroplating

IMPROVES ALUMINUM'S NATURAL ADVANTAGES:

Silver plating, for example, gives higher surface conductivity for high frequency currents employed electronically.

Soldered assemblies are possible where surfaces to be joined have been plated.

Successful plating on a production basis is an accomplished fact. "Careful control, knowing how, and strict adherence to formulae", are the rules laid down.



Perhaps you can help

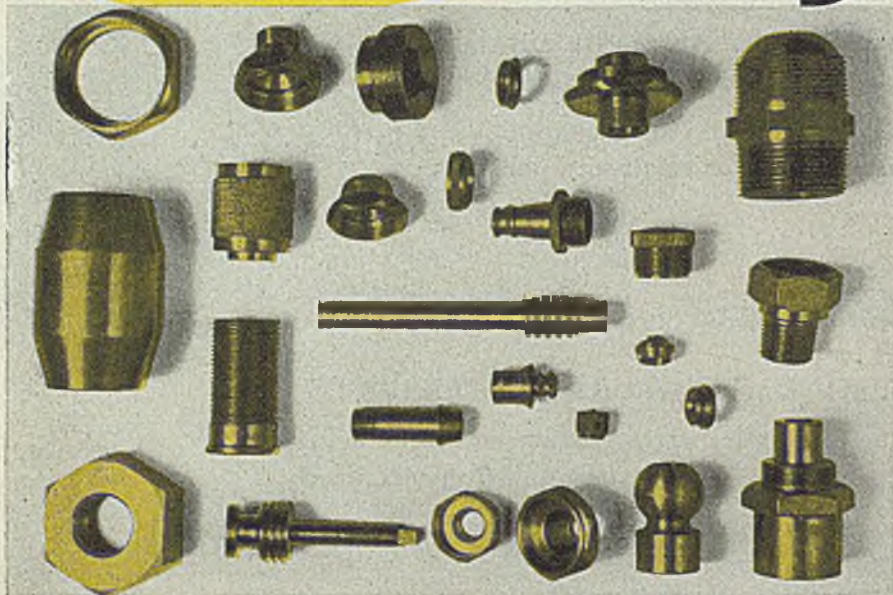
Additional facilities are needed to increase the production on plating operations. Agencies in charge of procurement say they will welcome the assistance of other companies in boosting output of wartime electronic equipment.

Alcoa offers you basic information on plating aluminum which will let you adapt the processes to your plant. If interested, write ALUMINUM COMPANY OF AMERICA, 211 1/2 Gulf Building, Pittsburgh 19, Pa.



ALCOA FIRST IN ALUMINUM

TITAN *free turning* Brass and Bronze Rods



➔ *for economy*

In Screw Machine Products

• Titan Free Turning Brass and Bronze Rods are recognized for their economies by many manufacturers of screw machine products. While the initial cost may be higher than that of steel, brass permits a production ratio of more than four to one. The tool life on brass is from four to eight times longer than on steel. Brass turnings have a proportionately high scrap value.

Due to its pleasing appearance, brass is often selected for parts which are not to have an applied finish. Where the product requires applied or plated finishes, there is the additional advantage in the use of brass because of reduction in preparation and plating costs.

Our engineers and metallurgists can readily determine the rod with the chemical and physical properties best suited to your particular product. We invite your inquiries for additional information.



Titan



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NEW YORK • CHICAGO • NEW ORLEANS • SAN FRANCISCO

Quality Alloys By Brass Specialists
Brass and Bronze Rod • Forgings • Die Castings • Welding Rods

rate of 131 per hr. Starting with cast blanks, they can be made at the rate of 450 per hr.

This, of course, considers only the output of a forging hammer and does not take into account the difference in cost or man-hours of the rolled steel blank and cast steel blank.

Centrifugally Cast Seamless Tubing: As a side issue of the main project, it was requested that the comparative qualities of seamless tubing from centrifugal castings and from pierced billets be examined.

Centrifugally cast hollow cylinders, 4½ in. and 3¾ in. OD were cast from SAE 4130 steel at the experimental laboratory of the United States Pipe & Foundry Co., Burlington, N. J. These were sent as rough cast to the Globe Steel Tubes Co., Milwaukee, where they were processed into tubing.

The 4½-in. castings were hot rolled to 4-in. and then cold drawn to 3½ in. OD. The 3¾-inch castings were hot rolled to 2½ in. and then cold rolled to 2 in. OD. Specimens of both tubings were sent to Battelle for examination along with specimens of the regular production of tubing made from pierced billets.

A comparison of the surface condition of the two types of tubing is obtainable from the pictures of the macroetched Figs. 6 and 7. It will be noted that, so far as the outside surfaces are concerned, there is very little difference, but that the inside surface is better on the specimens from pierced billets.

In flattening tests carried out according to ASTM Specification A83-42, Section 5a, both types of 3½-in. tubes showed equally good properties, while both types of 2-in. tubes failed. In a nonstandard reversed flattening, the pierced 2-in. tubes gave a better test. Tension test specimens cut from the tubes showed equal mechanical properties.

Portable Unit Offered for Batching Concrete

An improved concrete batching plant has been developed by C. S. Johnson Co., Champaign, Ill., for use of contractors and engineers requiring fast, accurate batching at construction sites. Batcher may be towed quickly and easily from job to job by an ordinary truck. Erection is simple. It has a 5-cu yd receiving hopper and a 90-ton per hour aggregate elevator. Total bin capacity is 45 tons, with three compartments arranged for two truck loads in each compartment. The portable unit batches into truck mixers, stationary mixers or paver batch trucks. One man control is provided.

Aluminum rear axle housings weighing as little as 193 pounds have proved dependable in actual road tests, according to Aluminum Co. of America, Pittsburgh 19. Reduction in unsprung weight leads to smoother riding and less wear and tear on equipment and tires.

Make 10 types of prints instead of 1



You can stretch *one* type of print only so far.

But when you use Ozalid, you can match the type of print to the job to be done, with the desired material (paper, cloth, foil or film). You can use your printmaking equipment in *all* departments—with different *colors* (black-line, blue-line, red-line, etc.) to identify the prints.

Ozalid gives you this 10-to-1 advantage because it is unique. Only two steps—exposure and *dry* development—produce positive prints direct from tracings, office forms or other originals.

Here are the ten types of prints you can make in seconds with an Ozalid machine:

1. **Black-line** on white paper.
2. **Blue-line** on white paper.
3. **Red-line** on white paper. For shop and office reproductions of drawings, typed material, forms, etc. Different colors can be used for different departments; to distinguish checked from unchecked prints, etc.
4. **Opaque cloth.** For exceptionally durable prints for shop use, permanent file copies, etc.
5. **Transblack Intermediate.**
6. **Sepia-line Intermediate.**
7. **Transparent cloth.** For "duplicate originals" to substitute in print production. Lines can be removed with Ozalid corrector fluid—saving invaluable time in making design changes.



8. **Transparent foil.** For composite or "overlay" prints; for reclaiming old or worn originals; for extra-fast duplicate originals.

9. **Chartfilm.** For lustrous, black-line prints on durable white plastic base. Oil-proof, waterproof. Cleans with damp rag

—no protective covering needed. Ideal for instrument panels, identification cards, etc.

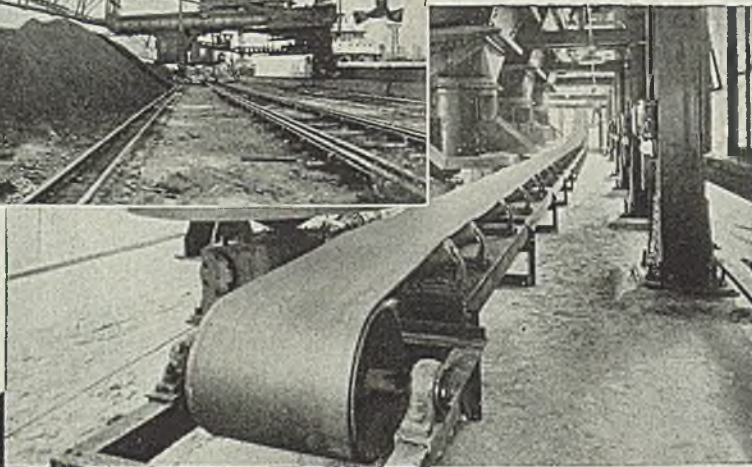
10. **Dryphoto.** For almost instantaneous, high-quality reproductions of any photographic subject: in black, sepia, or two-tone effect.



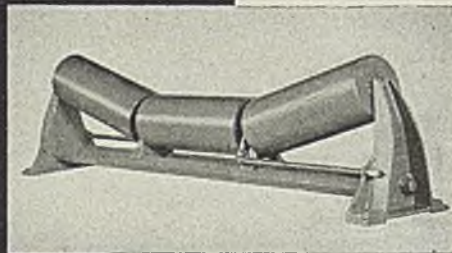
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Individual Oil Quenches

(Concluded from Page 122)

around and of such length as to exceed the length of the part by 2 or 3 inches. The inner wall of the sleeve was perforated with holes made by a No. 42 drill spaced $\frac{3}{8}$ -inch apart and alternate rows staggered.

The part was supported on three lugs to give egress of the quenching medium around the top as well as the bottom of the sleeve. In part of our experiments an additional $\frac{3}{8}$ -inch space was provided in the middle of the device by making up the sleeve in two parts as shown in one of the diagrams. This latter method increased the rapidity of the treatment somewhat.

This device was built up on a 2-inch Tee for a base making it compact and easily mounted or removed for replacement. The whole mount was over an ordinary quench tank, of course, beside which a centrifugal pump was placed drawing the oil from the bottom of the tank and forcing it up through a 2-inch pipe to the sleeve. A valve in the line placed for hand or foot operation controlled the oil flow.

Increasing Hardness

The part, taken from the furnace, was placed in the sleeve nearby; the oil flow turned on and maintained for a predetermined time. By varying the furnace temperature and the quenching time the desired increase in hardness was obtained.

The design of the sleeve had to be varied somewhat to fit the part being treated and the hardness near the lower end of the part was maintained by directing a stream of oil directly upward from the Tee base against the lower end.

The capacity of the throw of the pump used was found to be important and should always be taken into consideration. It was found in testing that a 100-gallon capacity throw gave a more uniform hardness reading even when used on a single quench sleeve, than did one with a 75-gallon throw. For a group of six sleeves, a 250-gallon capacity throw was planned. Pump capacity depends on the shape of the parts being treated and the number of sleeves that might be operating simultaneously.

For convenience the quench tank was redesigned lower but the capacity kept large enough to provide ample reserve of the medium. The result was that the part could be slipped into the sleeve without any upward reach on the part of the operator.

By this pressure quench method, the advantages of a mild quenching medium are retained, more desirable physical properties are secured, a single operation setup replaces a more complicated one, and increased production is secured.

It can be expected that, as the diameters of the parts treated increase, there will be a limit of successful treatment for a given steel, beyond which a steel of greater hardenability will have to be substituted.

MUSIC WIRE and HIGH CARBON STRIP STEEL

can be substituted for your shortage items!

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Begin negotiations for your share in large available tonnage of music wire and strip steel.

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This continuing sale by Reconstruction Finance Corporation places at your disposal *new* music steel spring wire in excellent condition, and new high carbon, cold-rolled strip steel, in fair to good condition. The strip steel is in many gauges and widths, mostly in coils. The music wire is well-protected, and is available in various gauges, catchweight coils. Both classifications are priced for use as substitutes for many other grades of wire or strip. The music wire is located in Boston, New York, Philadelphia, Cleveland, Chicago, and Pacific Coast regions; the strip steel in the East and Middle West.

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Unit Charger—For attachment on dash, cowl, side panel, or other places on vehicle, it may be connected to do its work with vehicle running or idle. It operates on 6 and 12 volts, direct current. B. F. Goodrich Co., Akron, O. ST355

Masking Stickers—Die-cut to exact specifications, name plate is attached to product covered with Kum-Kleen pre-cut masking sticker, then painted or finished. Stickers are applied without moistening, stick to any smooth surface, are not affected by heat or cold and easily peel off leaving no trace. Avery Adhesives, 451-453 East Third, Los Angeles 13. ST346

Self-Locking Pins—Designed to replace taper pins, keys, cotter pins, set screws, rivets, etc., they are pressed or driven into standard drilled holes and have four flutes on the surface parallel to axis. When inserted in drilled hole, raised edges are compressed inwardly, providing a resilient, self-locking element. Driv-Lok Pin Co., Chicago. ST378

Heating Pot—Developed for a variety of low melting point materials, pot is efficient in melting and maintaining liquidity of materials such as shellac, kerosene, turpentine, waxes, fusible metals, and certain types of plastic material. It is electrically heated, completely automatic, permanently wet, fire and explosion-proof and maintains a uniformly low temperature at all times. Kindt-Collins Co., 12651 Elmwood avenue, Cleveland. ST363

Protective Hood—Designed to give chemical workers protection against all concentrations of nitric, sulphuric, hydrochloric, acetic, hydrofluoric and carbolic acids, hood is made of Cesco Acitex. Clear window provides normal vision and is acid-resistant. Hood covers head, shoulders, chest and back and is tied at waist. Chicago Eye Shield Co., 2300 Warren boulevard, Chicago 12. ST379

Wetting Agent—For use in water-wash spray booths, compound No. 178, is added in small quantities to circulated water, to reduce surface tension of paint particles and insure wetting. This action aids in throwing particles from air stream, prevents them from adhering to metal surfaces and from clogging pump and piping, and facilitates their collection

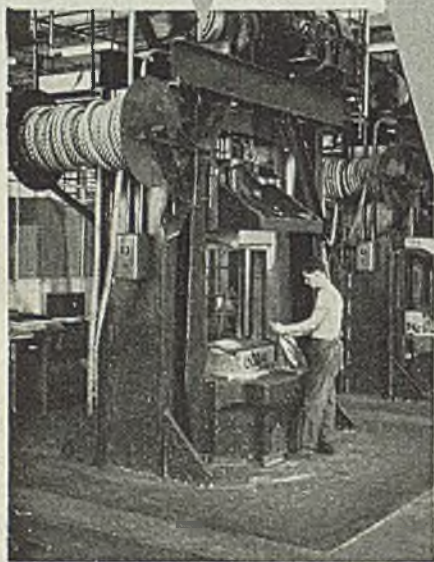
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VIBRATION CONTROL



The operator feels no vibration when this drop hammer is in operation because he stands on an isolated platform.

efficiency of the workmen has also increased, resulting in less spoilage and fewer accidents."

What are these steel spring vibro-isolators? How do they work? How are they installed? Do many concerns use them? What do hammer manufacturers think about them? Can punch presses and other impact machines be similarly mounted?

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and removal. Fidelity Chemical Products Corp., 430 Riverside avenue, Newark 4, N. J. ST 375

Coating—A new protective coating for the sidewalls of wet and dry spray booths facilitates cleanup. A booth so protected is stripped clean by spraying with water or steam, coating and accumulated paint flushing off together. Detrex Corp., 13005 Hillview, Detroit 27. ST348

Cleansing Cream — Den-Nex removes lacquer, paints, enamels, airplane dopes, varnish, resin solutions, synthetic adhesives, inks and dyes. It is free of abrasive, scouring or clogging substances, and leaves pores open, skin cleansed, soft and smooth. Dennis Chemical Co., 2701 Papin, St. Louis 3. ST 374

Paraffin—Resinous, flame and moisture resistant and nontoxic, Chlorowax is an ingredient of coating compounds applied as paints and as textile finishing compositions. It is compatible with many plastics and film-forming materials. Diamond Alkali Co., Pittsburgh 22. ST377

Terminal Block—Designed for greater voltage breakdown requirements in radio circuits, plastic terminal block helps to eliminate possible arcing at high altitudes. Direct shorts from frayed wires at terminals are prevented. It is capable of withstanding a 3000-volt alternating current insulation breakdown test. Paul Henry Co., 2037 South La Cienega boulevard, Los Angeles 34. ST347

Battery Plug—Designed for heavy duty service, a 600-ampere battery plug, with switching device and two 600-ampere contacts, is adaptable to many applications, wherever engine starting requires 600-ampere circuits. Its mating receptacle is the standard type GB-3-34-CDS receptacle. Cannon Electric Development Co., 3209 Humboldt street, Los Angeles, 31. ST380

Fountain Brush—Designed with a large fender guard to prevent ink on the bristles from getting on clothing, tables, etc. when laid on its side. Made of aluminum and has a fountain pen action with continuous, controlled ink flow. Diagraph-Bradley Stencil Machine Corp., 3745-55 Forest Park boulevard, St. Louis 8. ST362

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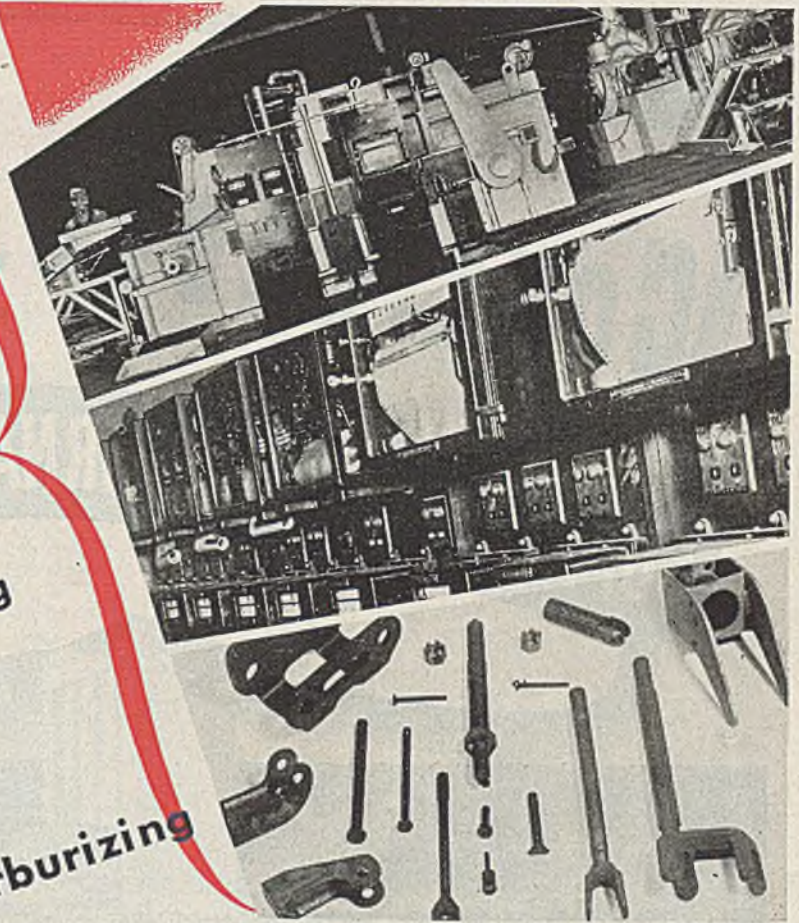
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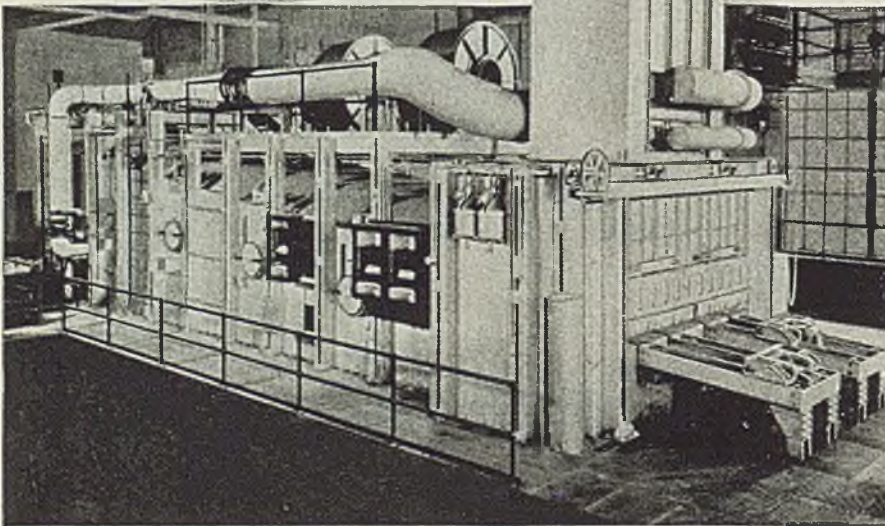
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SIZE: 12'3" wide, 38' long

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Photoelectric Control Reduces Pouring Hazards

A photoelectric control called type A20C, made by Photoswitch Inc., 77 Broadway, Cambridge 42, Mass., permits control of the pouring of several ladles of molten metal simultaneously from a remote station. Hazards encountered in hand pouring are eliminated, and several molds now may be poured in less time than was needed to pour one by the former method.

As each of the group of empty molds moves into position before a ladle, a photoelectric control, mounted directly above, scans them through a viewing tube. When molds are in place, the operator, through push button control of the hydraulic actuating mechanism, tips the ladles of molten iron, and white-hot metal flows into the molds. As it reaches the riser of each mold, a brilliant light is thrown off, a signal to the watching "eye" that mold is full. Control instantly drops the ladle back, and pouring automatically stops.

An adjustment on control housing may be set so that control will remain inoperative at one level of illumination, but will be actuated when the amount of light reaching the phototube varies slightly. It thus can be used to indicate and control density of gases as well as turbidity in liquids. This control also is said to be capable of distinguishing between a clear liquid such as water and air above it, or of detecting an interface between two liquids differing slightly in translucency.

The unit operates from a supply of 115 volts ac, 60 cycles, and incorporates a single-pole double-throw relay for normally open or normally closed operation. Relay contacts are designed to handle 10 amperes ac or 5 amperes dc.

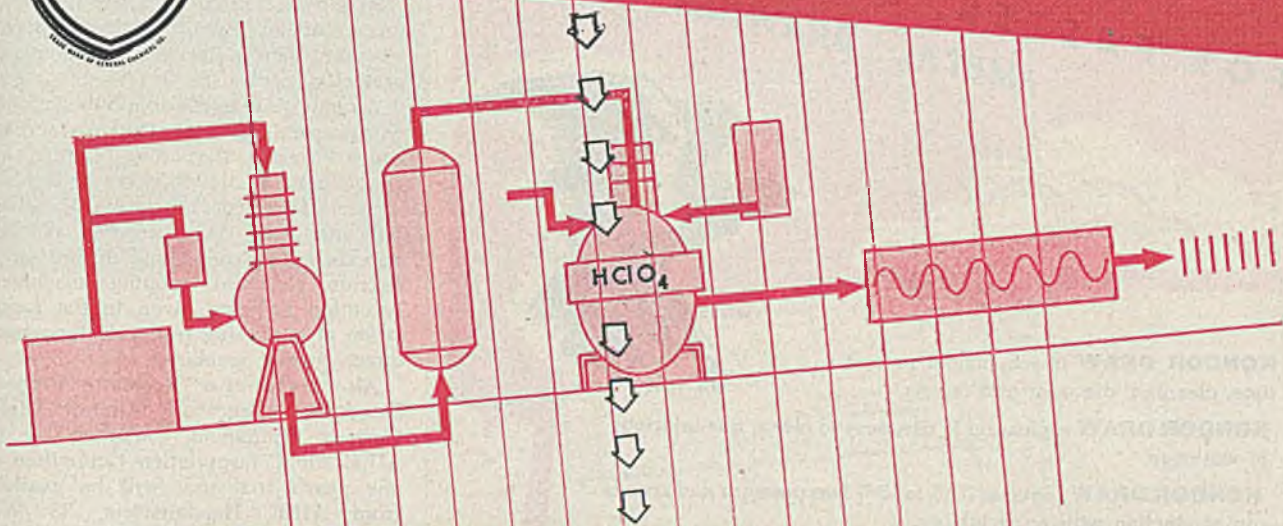
Aircraft Electrical System Standards Proposed

Standards work in the field of aeronautical electrical equipment in cooperation with the SAE, NASC, NEMA, the Army Air Forces, and the Navy Bureau of Aeronautics is being done by American Institute of Electrical Engineers under the auspices of the Standards Committee and the Air Transportation Committee. Four subcommittees of the Air Transportation Committee have been set up to carry on important assignments and requests made by other interested organizations.

Aircraft Electrical Systems Subcommittee is to prepare an informative report on "Fundamental Characteristics of Aircraft Electrical Systems." Report will present basic considerations involved in securing the most effective aircraft electrical application technique. It will contain an explanation of fundamental electrical problems, characteristic data for finding the abilities and limitations of devices and apparatus which comprise



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KONDOR DRAW is economical in cost, time, cleaning, die wear and rejects.

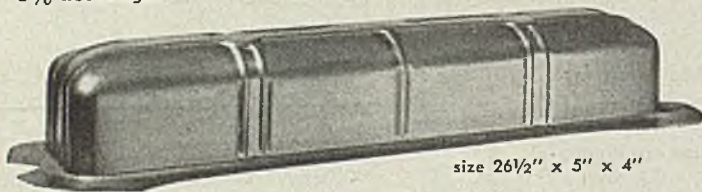
KONDOR DRAW is pleasant to use, easy to clean, non-injurious to workmen.

KONDOR DRAW requires 10% to 15% less pressure and speeds up production with no wrinkling.

KONDOR DRAW will make your tough metal drawing jobs easier and more economical as it did on this job.

HERE WAS THE TROUBLE

Difficulty in degreasing the lubricant used and an average of 8% breakage.



size 26 1/2" x 5" x 4"

20 gauge cold rolled stock, drawn from blank in one operation as shown in unretouched illustration of a rocker arm cover case.

ANALYSIS OF TROUBLE

It was necessary to hand clean each part. Breakage on certain steels required very rigid metallurgical specifications.

RESULTS WITH KONDOR DRAW

With no change in procedure, Kondor Draw was applied. Hand cleaning was eliminated, previously rejected steel was processed with breakage reduced to less than half of one percent.

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aircraft electrical systems, systematic procedures for analysis or computation of aircraft electrical system performance, and general application practices.

Aircraft Electrical Control and Protective Devices Subcommittee will prepare electrical standards and test codes covering aircraft control and protective devices to aid in the rating, testing, and application or evaluation of such for aircraft service. Problems being studied by this group are circuit breaker characteristics and their performance in adequately protecting cables.

Aircraft Wire and Cable Subcommittee will prepare electrical standards and test codes covering the rating, testing, and application of aircraft wires and cables.

Aircraft Electrical Rotating Machinery Subcommittee will prepare electrical standards, test codes, and definitions for aircraft electrical rotating machinery. Attention is being given to the formulation of a suitable test code for aircraft direct current machines.

Also, copies of a "Report on Proposed Standard Voltages for Aircraft Direct-Current Equipment," adopted by the AIEE Air Transportation Committee for one year's trial use, will be available from AIEE Headquarters, 33 West Thirty-ninth street, New York 18.

Special Lubricant Protects Wire Rope

Wire rope covered with a green-colored lubricant has been developed by American Chain & Cable Co., Bridgeport, Conn., for its American Cable and Hazard Wire Rope Divisions. Only highest grade rope, preformed of improved plow steel, will be so lubricated. Non-preformed ropes made of improved plow steel will continue to be identified by a single green strand.

"Green-Lube" has high viscosity and adheres satisfactorily to wire surfaces. It has a grease-like consistency at normal temperatures, and is applied hot and in a molten state by the pressure method, assuring complete coverage of every wire and filling of voids between wires. This makes possible better protection of wires, easier adjustment, and longer adhesion to wires, making for longer rope wear.

Stress Problems Solved by Analyzer

An "electrical thinker," designed by Westinghouse Electric Corp., East Pittsburgh, to meet new problems in design and construction of turbo-generator units for production of electricity, is said to give answers to mechanical stress problems too complex for mathematical analysis by solving them on an electrical circuit. The heart of the unit, called the mechanical-transient analyzer, includes specially designed low-loss electrical elements, particularly a new type of coil used to produce the effects of a mechanical system in electrical circuit.

In apparatus such as turbo-generators, engineers must know what effect a short

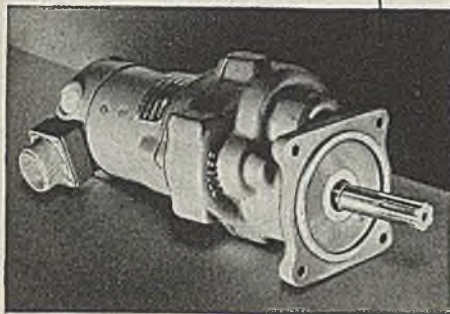
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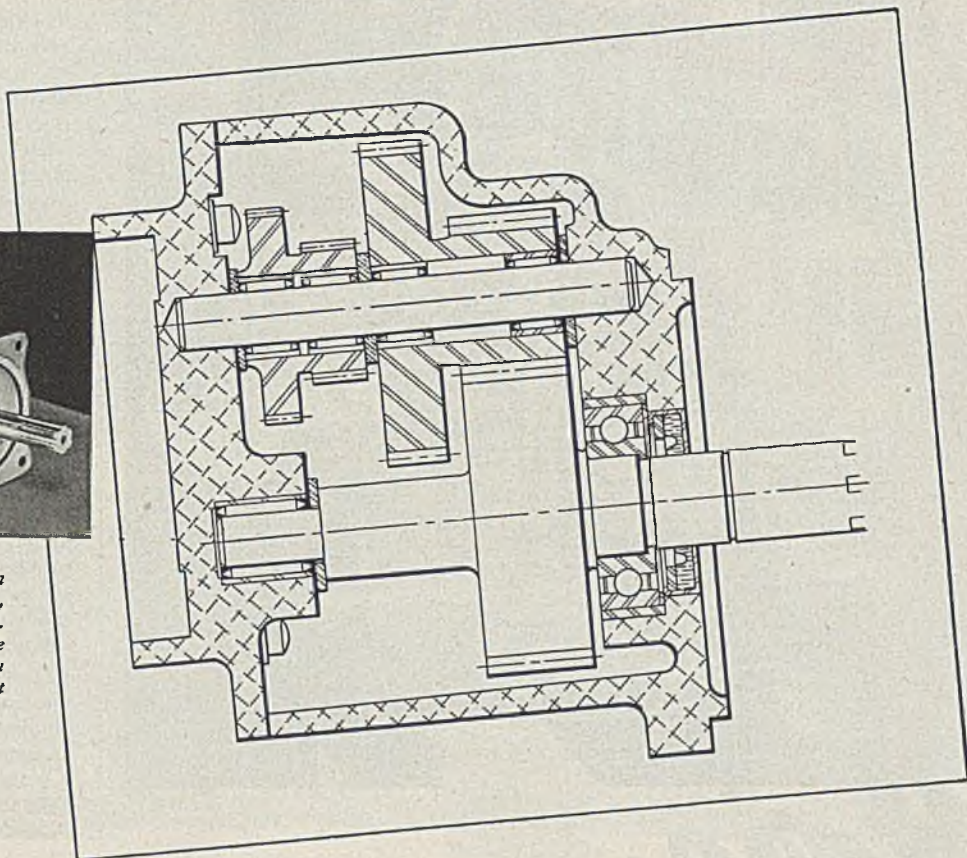
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X-section shows 5 of the 7 anti-friction Needle Bearings used on Air Associates, Inc. gear reduction drive for aircraft. This is typical of Torrington Needle Bearing use to get the high anti-friction performance from small design weight and space.



Needle Bearings Give Increased Design and Operating Efficiency to Gear Reduction Drives

Torrington Needle Bearings combine unusually high load capacity into a small, compact bearing with low coefficient of friction that offers many design advantages. That's why, in the widely used gear reduction drive made by Air Associates, Inc. for the retractable landing gears, canopies and other moving parts of so many fighter aircraft, the gears and shafts turn on these modern anti-friction needle bearings.

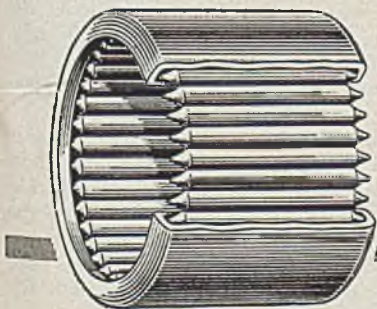
Torrington Needle Bearings are light in weight and compact, yet engineered to stand up to high speeds and heavy loads. They also permit other weight and space savings in the design of housings and other component parts . . . are easy to install, maintain and lubricate!

Why not have these Torrington Needle Bearing advantages on the tools or machinery you design, build or operate? Our Catalog No. 32-A is packed with useful data on anti-friction Needle Bearing applications ranging from kitchen appliances to textile and agricultural machinery. You should have this helpful data in your engineering and design files. Drop us a line and we'll gladly send you a copy.

THE TORRINGTON COMPANY

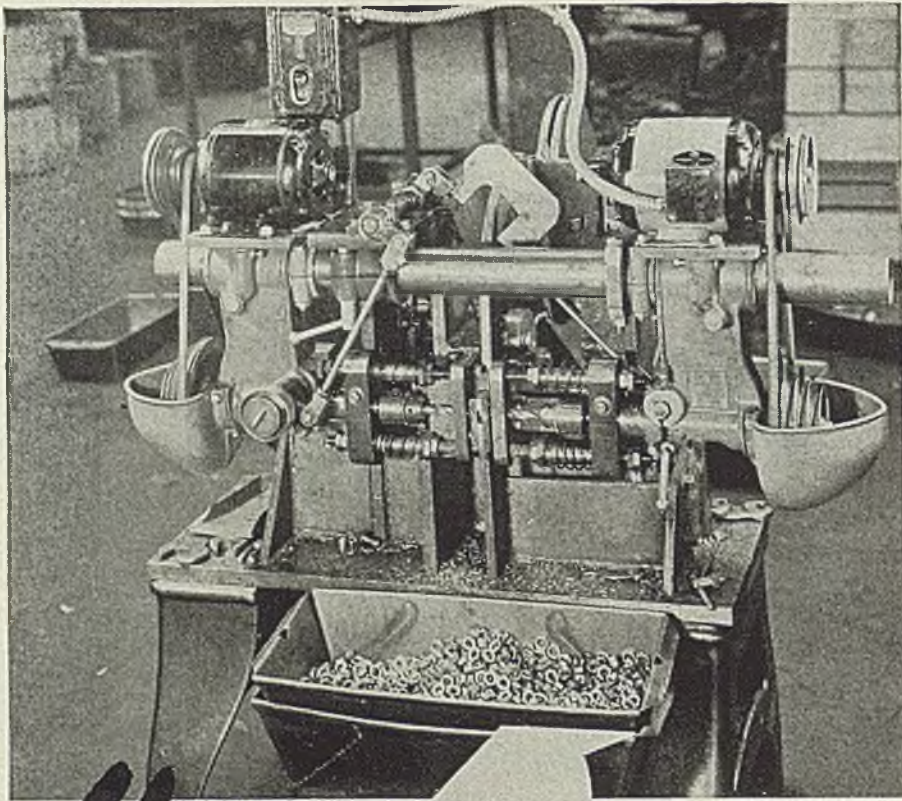
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TORRINGTON NEEDLE BEARINGS





Here the extra cost of a special machine is saved. with stock-model Delta units

A typical war production experience showing how to cut your investment risk in retooling—yet maintain volume and quality:

1. Use standard, low-cost Delta components to build your own high-production, special-purpose machines — quickly convertible to other uses when requirements change.
2. To modernize your present machines that are rapidly approaching obsolescence, replace worn elements with regular, stock-model Delta units.
3. Utilize the portability and compactness of Delta-Milwaukee Machine Tools, to revise or supplement production-line layouts for the best sequence of operations.

MA-21

● Automatic Screw Machine Products Co., Chicago, Ill., was faced with the problem of making fully automatic the countersinking of aircraft nuts before tapping.

Like many another war plant, the firm found the answer in the versatility of Delta-Milwaukee Machine Tools . . . in their ability to operate in any position—upside down, sideways, or at an angle — without lubrication problems.

Two low-cost Delta 14" Drill Presses were mounted "face down" on the same column, to make a high-production machine

suited to the specific job requirements.

The former rate for countersinking on a hand-operated machine was 1500 pieces per hour. The special set-up (illustrated) turned out 4800 pieces per hour — more than three times former production!

Delta's savings in cost, weight, and space are not obtained at the expense of quality. They result from advanced design and from quantity production of standard models.

Low-cost Delta units and the ingenuity of your engineers may be the solution to your changing production problems. Investigate the many advantages of tooling up with famous Delta-Milwaukee Machine Tools.

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Delta's 76-page Blue Book

provides case histories of 140 production ideas that got results. Helps you more clearly visualize the almost unlimited money-saving applications of Delta-Milwaukee Machine Tools. Also available is a catalog of these low-cost machine tools. Request both, using coupon below.

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circuit will have on the shaft and other mechanical parts when the smooth and co-ordinated running of apparatus is upset. Severe stresses occurring when orderly operation of machinery is interrupted, the effect on parts, such as the shaft, is similar to a brake being applied suddenly to one of four wheels of a speeding car. If there is a breakdown in the equipment, lasting for only a fraction of a second, because it isn't built for peak stresses, a power station may be in for serious trouble.

With the newly developed analyzer, it is possible to determine the worst conditions under which the apparatus might operate and carry out the design in line with such data, according to the company. From results of the electrical test, an equation is obtained, and it is applied to the problem of the mechanical system under test. Without the analyzer, many problems of determining the peak stresses of turbine-generator shafts are too complex for ordinary mathematical solution.

This device also may be used for almost any mechanical stress problem, including determination of peak stresses in an airplane at the onset of "flutter" when a plane reaches the speed of sound from 740 to 760 miles per hour, and the "rideability" of an automobile.

Compounds Prevent Engine Casting Leaks

A new series of Thalid compounds, used to impregnate magnesium and aluminum aircraft engine castings for prevention of liquid and vapor leaks, has been developed by Monsanto Chemical Co., Plastics Division, Springfield, Mass. Material is reported to provide maximum sealing effectiveness with full adaptability to sealing castings on a production line basis. Threatened bottleneck, caused by shortage of tung oil, thus far has been averted.

Thalid X100 series resins, used as casting sealants, are thermosetting solutions, a mixture of base resin and styrene monomer. By varying the ratio of the two, viscosity of impregnating solution can be controlled to meet varying requirements arising from variation in the size of porosity in aluminum and magnesium. Solution is applied by positive pressure of vacuum-pressure impregnation.

Following impregnation, castings are put through a heating cycle which thoroughly cures the resin to a slightly rubbery condition within the pores of the metal. Parts subsequently may be machined, although casting usually is fully machined before impregnation with the compound.

Cured sealant is said to have satisfactory stability under high engine temperatures and resistance to lubricating oil, hydraulic fluids and cooling solutions. Bulletin X100-2, fully describing the new sealant, is available from the company by application on official letterheads.

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Plastalloy

Specialized mold steels that meet exacting manufacturing requirements

Plastiron is of low carbon content, melted and hot-worked with great care, and is as clean and soft as the steel-making art can produce. It is exceptionally easy to hob, and is ideal for intricate shapes and short runs.

Plastalloy is a low carbon, nickel chrome steel of finest mold quality. It is annealed to provide ease of hobbing, and it develops an extremely hard, deep case, having high resistance to swamping and erosion.

Each is produced by modern steel practice from carefully selected ingredients, in electric furnaces, and under careful control. Each provides these important advantages:

- A low carbon content
- Thoroughly clean and uniformly sound
- Produces unusually smooth cavities
- Will withstand extreme hobbing
- Carburizes evenly
- Ideal for difficult shapes

Disston engineers will be glad to help you with your postwar plans

The wide experience of Disston engineers and metallurgists with the plastics industry is at your service. You may feel free to consult them at any time regarding your mold problems. They will be glad to cooperate with you, advise you frankly, and without obligation. Write fully, and in confidence.

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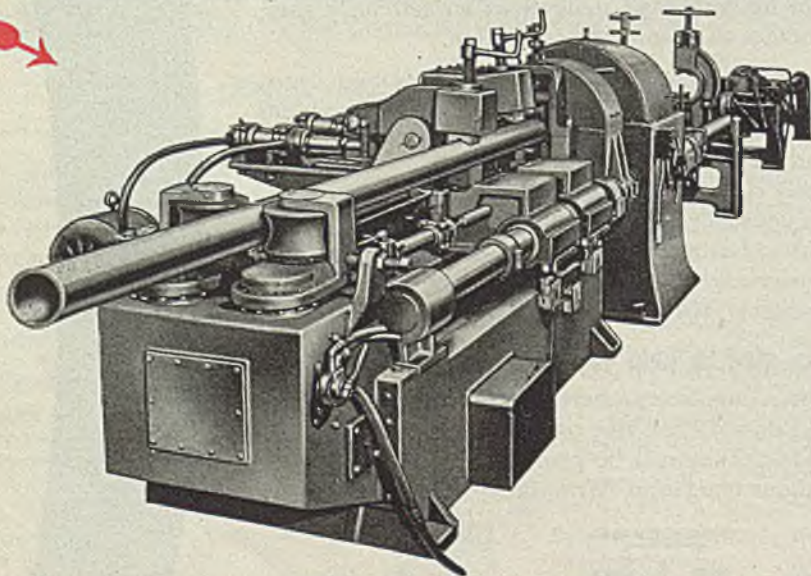
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For speed...and for precision! Continuous, automatic feeding gives you high production unequalled by any other type of turning machine! For both rough peeling and finished precision conditioning, Medart Centerless Bar Turners will turn bars and tubes at maximum rate obtainable from any present day cutting tools. The machines are very flexible. May be used with one or two cutterheads, with one or up to eighteen tools in each head.

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New Literature

RADIANT HEATING

By A. M. Byers Co., Pittsburgh.
(A 52-page book, illustrated, tables).
For designer and fabricator. Topics include figuring heat losses and piping requirements, designing coils, supply and return mains, relative merits of locating coils in floor and ceiling. Also contains 23 typical installations covering wide range of structures. Tables are reproduced showing heat transfer properties of various piping materials. There also is a section on pipe bending and welding.

—o—

DIE STEELS

By Firth-Sterling Steel Co., McKeesport, Pa.
(Two pages, illustrated, in color.)
Describes 14 HWD and Cromovan controlled-quality steels for hot and cold work, with performance records from a wide variety of applications.

—o—

ALL-WELDED STEEL HEATER

By Kewanee Boiler Corp., Kewanee, Ill.
(Four pages, illustrated, in color.)
Listed are specifications, measurements and ratings for five sizes of Kewanee heaters, standard and extra-heavy. Brief history of development of Tabasco heating unit and exposition of improved base and rocking grate included.

—o—

STEAM POWER PLANT PLANNING

By Westinghouse Electric Corp., Pittsburgh 30.
(A two-part 40-page booklet (B-3153), illustrated, with charts.)
Part I describes types of turbines and lists sizes and speeds. Part II covers basic operating conditions, including effect of deviation in pressures and temperatures at heat rates, regenerative feed-water heating, recommended condenser sizes and dimensions, condenser friction, impeller, propeller and axial type circulating pumps, and condensate pumps.

—o—

ELECTRONIC PRODUCTS

By North American Philips Co., 100 East 42nd street, New York 17.
(An 8-page catalog, illustrated, in color.)
Subjects, all Norelco products, are: (1) Cathode-ray, transmitting, power and amplifier tubes; (2) quartz crystal oscillator plates; (3) Searchray (X-ray) inspection units; (4) Geiger-counter X-ray spectrometer; (5) film-type X-ray diffraction equipment; (6) quartz crystal X-ray analysis unit; (7) metallurgical products—tungsten and molybdenum powder, rod, sheet and wire. Also aluminum



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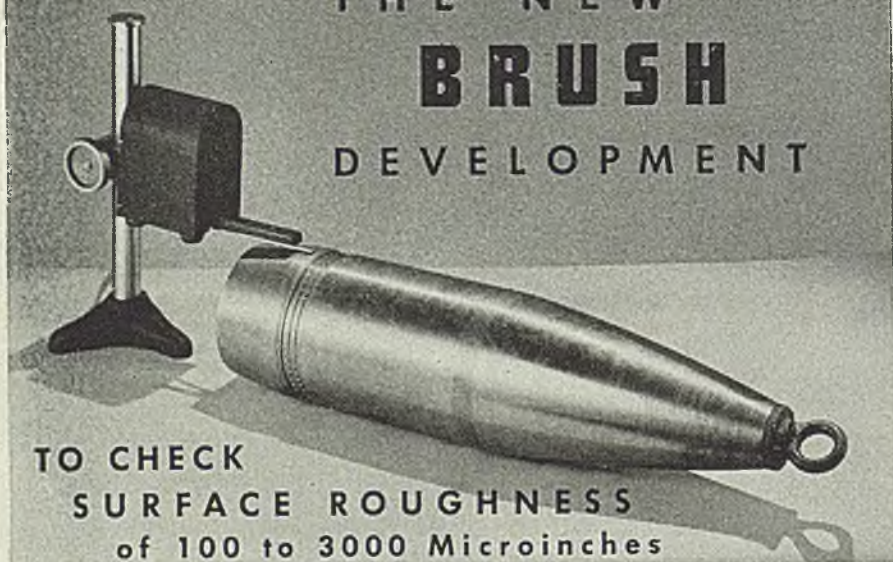
sive, eager, abreast of the times. The path to our door, via wires, telephones, mail and personal calls, is well worn by America's most critical buyers of Steel Drop Forgings.

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A perfect complement for the Brush Surface Analyzer is the new Rough-Finish Measuring Head. Developed to meet the growing need for the checking of rougher surface finishes and waviness, it accurately measures irregularities from 100 to 3,000 microinches, peak to valley.

This new Pickup (Model BL-101) and Drive Head (Model BL-102), when used with the Brush Surface Analyzer, extend its usefulness and range of measurement from 1 to 3,000 microinches.

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alloy, enameled copper, resistance, silver and gold-clad silver wire in fine sizes; (8) medical X-ray equipment.

ELECTRONIC CONTROLS

By Wheelco Instruments Co., 537 South Dearborn Street, Chicago 5.

(A 12-page catalog, Z-6300.)

Describes electronic principle by which control is effected without contact between measuring and control units of instrument, as well as indicating pyrometers and pyrometer controllers, indicating resistance thermometers and resistance thermometer controllers, input controllers, program controllers, portable potentiometers, combustion safeguards, and thermocouples.

HELIX END MILLS

By National Twist Drill & Tool Co., Rochester, Mich.

(A 16-page, illustrated booklet.)

Describes new tools designed for milling slots, keyways and pockets where ordinary arbor type milling cutters cannot be used. High helix angle of cutting edges and general free cutting construction make possible smooth and efficient operation at high speeds.

DUAL RAM BROACHING MACHINES

By Colonial Broach Co., P. O. Box 37, Harper Station, Detroit 13.

(A 4-page, 2-color folder, VAD-44, with tables.)

Describes standard line of improved broaching machines, designed for surface broaching to provide maximum output combined with continuous high precision. Included are a case history illustrating flexibility in use of machines, specifications and dimensions.

ELECTRODE COMPARISON CHART

By Allis-Chalmers Mfg. Co., Milwaukee 1.

(An 8-page bulletin, B6344A.)

Compares equipment from 22 electrode manufacturers and contains information on stainless steel and hard surfacing electrodes, as well as the mild steel type. A section is devoted to a typical weld deposit analysis of stainless steel electrodes, showing percentages of chromium, nickel, carbon, columbium, and molybdenum.

STAINLESS STEEL FASTENERS

By Allmetal Screw Products Co., 33 Greene Street, New York 13.

(An 83-page engineering catalog.)

Designed to aid in selecting the right size and type of noncorrosive fastening device for a particular job. Includes a brief introduction concerning stainless steel, stock sizes and physical dimensions of various bolts, cap screws, nut and pipe fittings, special screw machine

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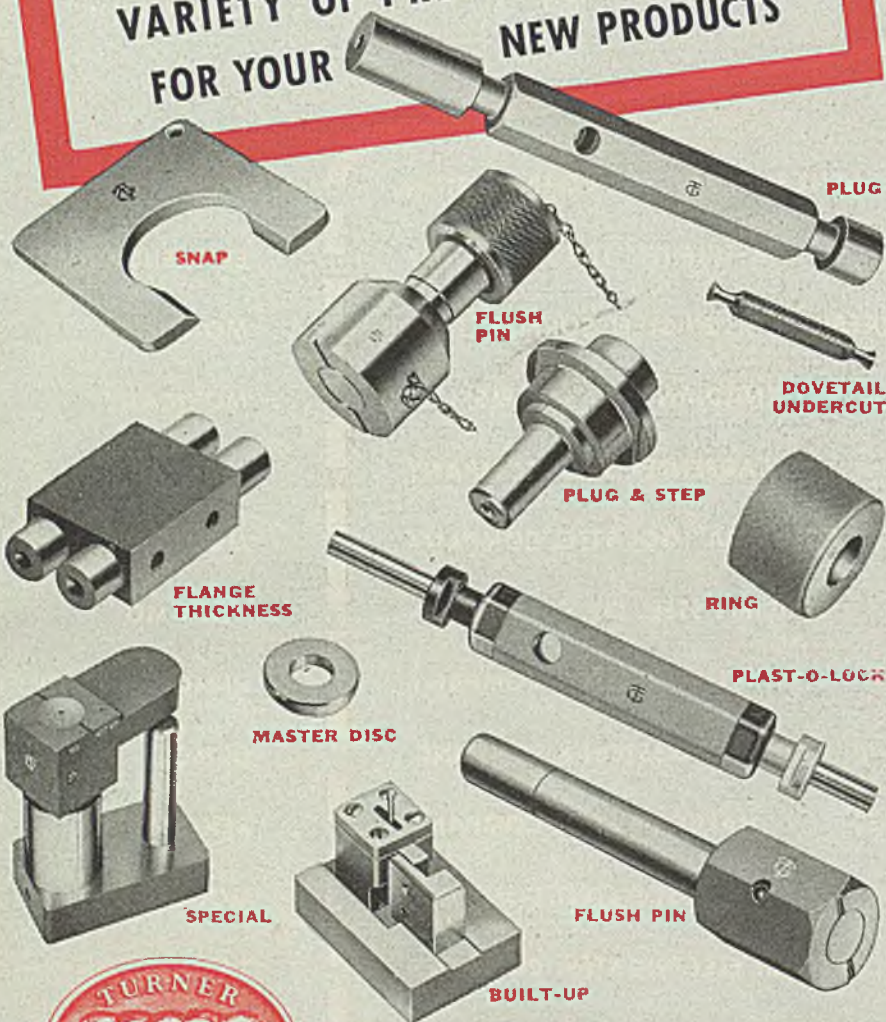
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COLUMBIA TOOL STEEL COMPANY	"MOLITE 8"
CRUCIBLE STEEL CO. OF AMERICA	"REX T-MO"
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JESSOP STEEL COMPANY	"MOGUL"
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parts that can be made to order, and a section containing engineering tables and data.

FUTURE OF WELDING

By Victor Equipment Co., 844-54 Folsom street, San Francisco.

(An 18-page booklet, Form 50, in color, illustrated.)

Describes the plant and facilities, the background, present status, and future of welding, and the diversified line of welding equipment and supplies made by the company.

FASTENING DEVICES

By Parker-Kalon Corp., 194 Varick street, New York 14.

(Catalog with illustrations and tables.)

Describes self-tapping screws, socket screws, and other fastening devices and contains illustrated instructions on where and how to use them.

HYDRAULIC SLOTTERS

By Rockford Machine Tool Co., 2500 Kishwaukee, Rockford, Ill.

(Illustrated bulletin.)

Contains specifications for 12 and 20-in. stroke models. The 20-in. stroke model is a new size, similar to the 12-in., except that the column is raised and stroke length increased. This model, designated Hy-Draulic Slotter, also has stroke length control dogs mounted on side of ram.

WIRE AND STRIP MILL FURNACES

By W. S. Rockwell Co., 50 Church street, New York 7.

(An 8-page catalog, No. 418, with illustrations and drawings.)

Describes batch loading or continuous types of gas, oil and electric furnaces for annealing, bright annealing, clean annealing, galvanizing, hardening, heating, normalizing, patenting and tinning.

METAL CUTTING TOOLS

By Chicago-Latrobe Twist Drill Works, 411 West Ontario street, Chicago 10.

(A 6-page pamphlet.)

Describes cutting tools, including twist drills, reamers, and counterbores, and gives information regarding their suitability for various types of materials. Lists regular sizes manufactured and obtainable from stock.

WIRE BELT HOOKS

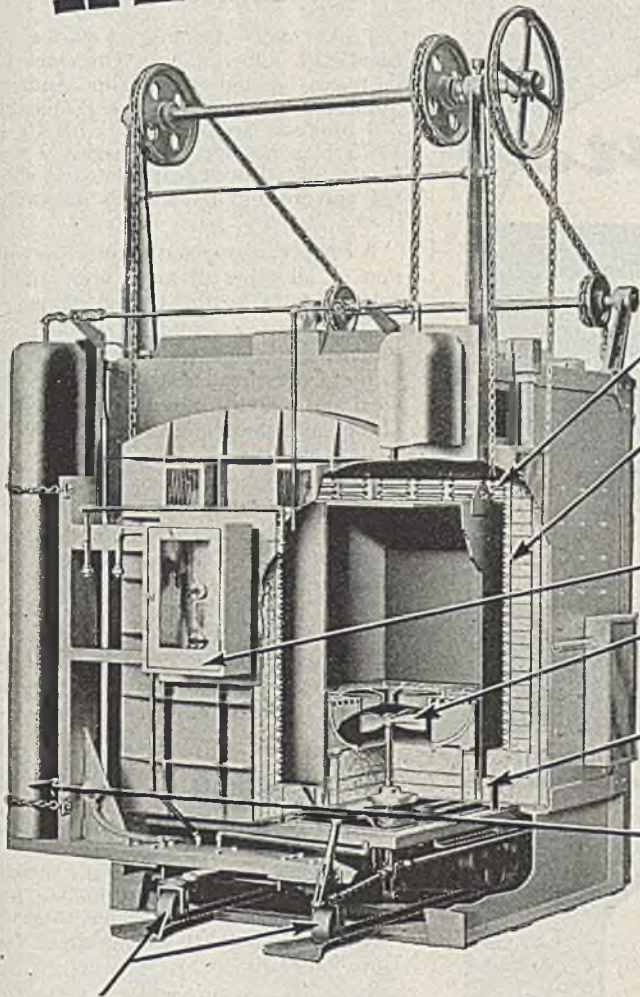
By Bristol Co., Mill Supply Division, Waterbury 91, Conn.

(Illustrated bulletin)

Shows method of applying hooks to all type of flat belts. Also includes specifications and prices.

All publications described here are available without charge unless otherwise noted.

HEVI DUTY CAR TYPE NITRIDING FURNACE



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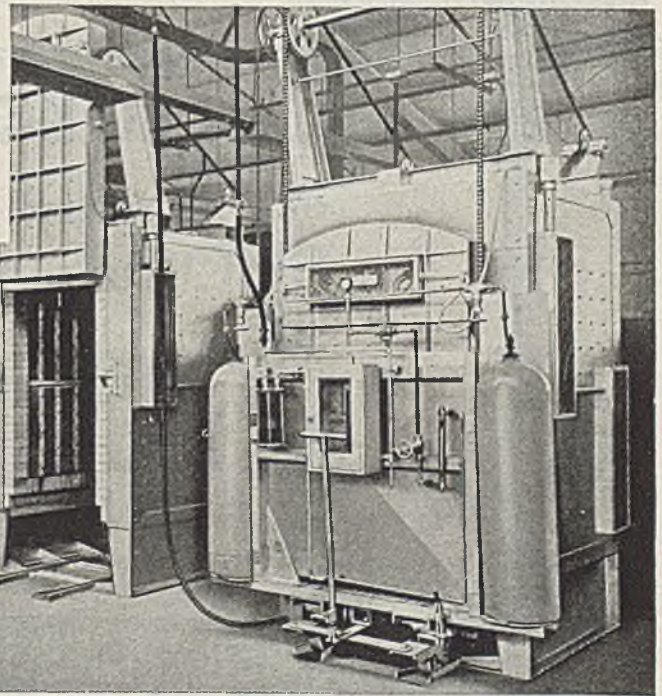
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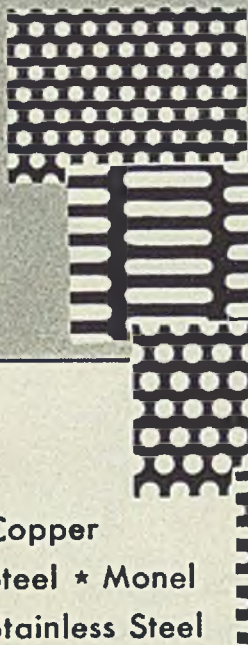
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Book Notes

Portfolio of Tanks and Armored Vehicles

Tanks and Armored Vehicles, by Lieut.-Col. Robert J. Icks, Ordnance Department; edited by Philip Andrews; published by Duell, Sloan & Pearce Inc., 270 Madison Avenue, New York 16, for \$4.75 plus postage; 264 pages, 9 x 12 inches, 432 illustrations; printed in sheet-fed gravure and letter press on antique stock.

A comprehensive and graphic presentation of all types of tanks and armored vehicles built by the United Nations as well as enemy countries through the years, this volume will prove of interest to the general reader as well as the technical and military expert. Chapters cover history and development prior to World War I, elements of design and construction, and a complete analysis of equipment by countries.

While the review of U. S. tanks and armored cars is carried through 1942, there are a number of examples of more recently developed equipment, such as the M-26 General Pershing 45-ton tank, as well as numerous experimental types, which are not included. Five of these are referred to briefly in an addendum.

Basic Reading Kit for Helping the Foreman

Foremen's Basic Reading Kit, fabrikoid, 213 loose-leaf pages, 6 x 9 inches; published by American Management Association, 330 West Forty-second street, New York, for \$3.50.

This volume is an effort to place within reach of the foreman a large body of information of high value in giving the latter the best ideas of his place in representing management to the worker. It is offered as useful and helpful to all foremen who desire to succeed as managers and to develop their own resources as a step toward further success in the world of management.

The initial chapter deals with the foreman's role in management and goes on to discussion of understanding people in work relationships, human relations, improvement of morale, supervision of women on production jobs, supervision of apprentices and other subjects. To help appraisal of the foreman by himself there is included a foreman's discipline check list and a foreman's balance sheet.

A circular slide rule for use in computing the approximate hardenability of steel from its chemical composition and grain size in accordance with standard formulae has been designed by metallurgical engineers of Steel and Tube Division, Timken Roller Bearing Co., Canton 6, O. It may be obtained by request on company letterheads.

Dear Friends,
 Like you people, we've devoted
 every effort toward the end... VICTORY.
 Thanks for your cooperation and
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 We'll be geared-
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 even better steel
 plates faster after
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 Keep on Buying
 War Bonds.

Steel Plates to Navy Department Specifications—U. S. Navy Department Hull and Boiler Steel—Tank and Structural Steel—Marine, pressing, copper bearing and flange steel—Ordinary Fire-box, Still Bottom and Locomotive Fire-box Steel—Hull Plates to Lloyds and American Bureau Specifications.

Complete spinning equipment for Flanged and Dished Heads from 9½" to 216" O.D.—and from 3/16" to 4" thickness—any size or type to Standard A.S.M.E. or A.P.I. Specifications.

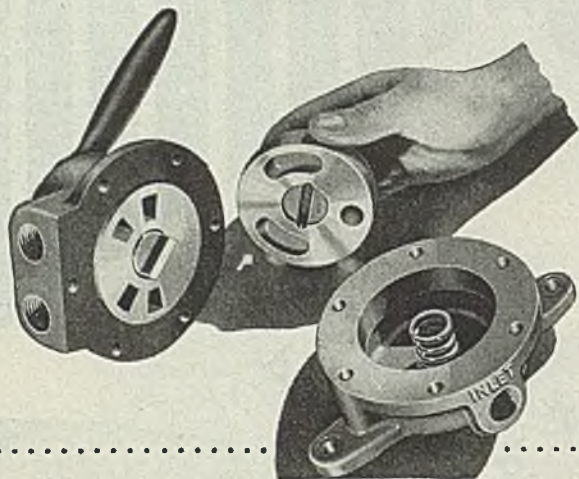
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ation and smooth acting control.

Hannifin Air Control Valves are made in 3-way and 4-way types, hand and foot operated, manifold, spring return, and heavy duty rotary types. Write for cylinder and valve bulletin with complete data. Hannifin Manufacturing Company, 621-631 South Kolmar Avenue, Chicago 24, Ill.

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AIR CONTROL VALVES

HOW TO HANDLE STEEL

Faster



Move a KRANE KAR up to a pile of forgings, bars, blooms, billets, ingots, castings (or a scrap heap when equipped with an electric magnet), and top the boom with the full load. Transport load forward or backward and position it on either side in places inaccessible to a rigid boom crane. Make speed with the all-around safety features—stability without jacks or outriggers; automatic braking of boom and load, easy steering, and utter simplicity of operation. Write for catalog No. 58.

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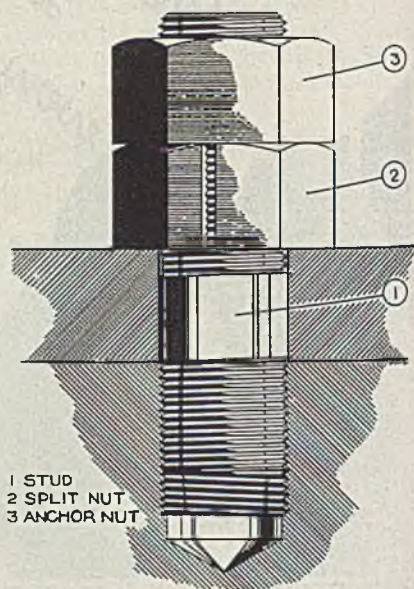


Plastic Instruments Check Maps and Charts

Aerial photo interpreter instruments for checking and analyzing maps and charts are manufactured by a process which produces accurate photographic reproductions on Vinylite rigid plastic sheets, a product of Bakelite Corp., 30 East 42nd, New York 17. Process involves coating plastic sheets with a photographic emulsion, imprinting, then overlaminating with Vinylite resin film. Dimensional stability of the sheets is said to insure retention of initial accuracy of the instruments under all conditions. Instruments are non-flammable, fadeproof, and resistant to oils, greases, water, and most acids and alkalis, according to the company.

Stud Removal Simplified By Self-Locking Jam Nut

Two standard nuts, one slotted lengthwise, are backed against each other as shown in the drawing. Wrench pressure on the split nut binds it to the stud threads, providing extra friction by which



1 STUD
2 SPLIT NUT
3 ANCHOR NUT

the stud may be removed. The second nut serves as an anchor. Studs are removed without damaging threads by this method at the Erie Works of General Electric Co.

Paints Tested for Service on Galvanized Iron

An unusual test of 21 paints on galvanized iron sheets of a granary in Illinois is one of a series conducted by American Zinc Institute over the past 10 years to compare service properties of metallic zinc paints with those of other paint coatings on galvanized iron. Sheets on granary were painted in 1934, and the report claims that only three paints present a good appearance today: One coat of metallic zinc paint with about 10 per cent of film gone; two coats of metallic zinc paint with some pin holes showing,

ANOTHER

G-E Fully Automatic Anodizing Power Unit Installed

This large automatically controlled power unit for 5000-ampere 40-volt chromic acid anodizing was recently installed in one of our largest B-29 bomber manufacturing plants. Essentially, the unit consists of eighteen G-E "2000" large capacity copper-oxide rectifiers, a motor operated control with its accessories and an operator's panel.

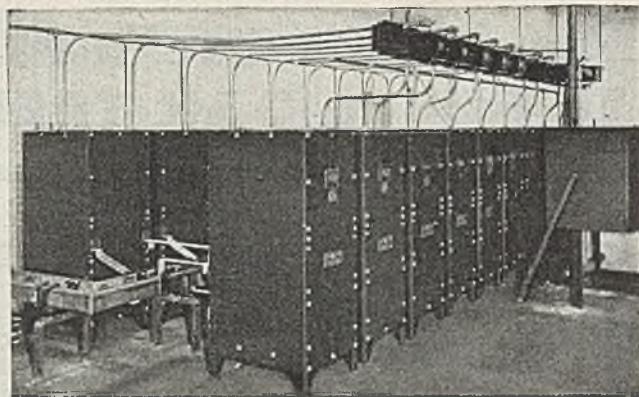
To anodize, the plater simply presses the start button on the operator's control panel. Thereafter the whole anodizing process is fully automatic. When the anodic film is formed the unit shuts off automatically and returns to starting position for the next load. No adjustment is required regardless of the size of load. Voltage build-up in relation to the formation of the film is positively controlled. All chance of overloading the equipment is eliminated. G-E fully automatic power equipment completes the anodizing in the shortest possible time.

For modern anodizing needs, select your power equipment from the G-E line. There are many different rated units from which to choose. Detailed data on request from Section A65 1-90, Appliance and Merchandise Dept., General Electric Company, Bridgeport, Conn. Write today.

Hear the General Electric radio programs: "The G-E All Girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news Monday through Friday 6:45 P.M. EWT, CBS. "The G-E House-party" Monday through Friday 4:00 P.M. EWT, CBS.

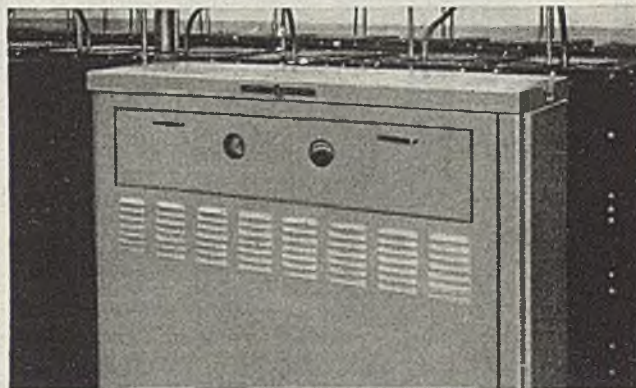
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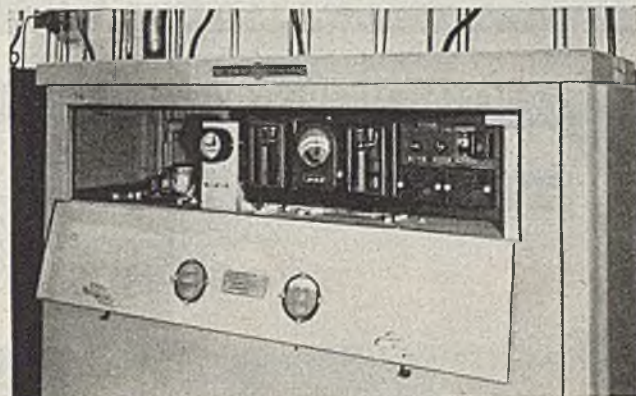
RECTIFIERS

Eighteen G-E "2000" Copper-oxide rectifiers connected in parallel provide output of 5000 amperes 40-volts d-c.



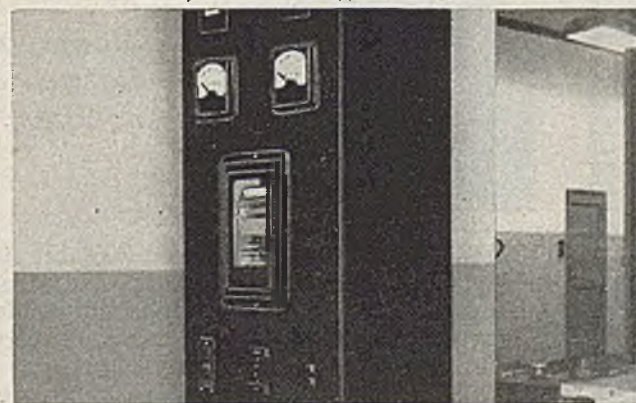
RECTIFIER CONTROL

Fully automatic, easy to use, reduces labor costs. Eliminates "human element" factor and leaves nothing to chance.



RECTIFIER CONTROL ACCESSORIES

Open view of control showing the contact-making voltmeter, the transfer relay, the timer and other accessories.

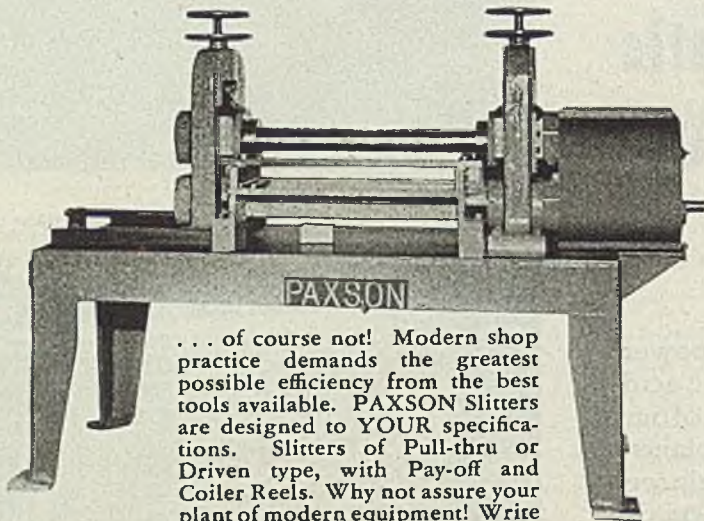


OPERATOR'S CONTROL PANEL

Located near the tanks for operator's convenience is complete with start-stop push buttons, indicating instruments, recording voltmeter, etc.

(Photographs courtesy of LaSalle Inc.)

Would You Use a PENKNIFE To Fell an OAK TREE?



. . . of course not! Modern shop practice demands the greatest possible efficiency from the best tools available. PAXSON Slitters are designed to YOUR specifications. Slitters of Pull-thru or Driven type, with Pay-off and Coiler Reels. Why not assure your plant of modern equipment! Write us today for complete details on these exceptional machines.

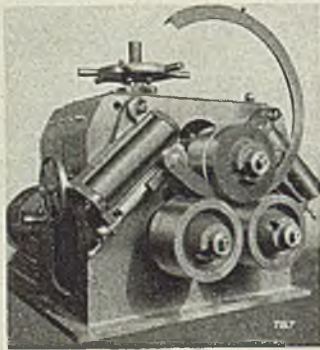
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THOMAS BENDING ROLLS are available in horizontal or vertical types and a variety of sizes. Correctly designed and sturdily built, these machines will render many years of fast, accurate service at a minimum of operating and maintenance expense.

Our bulletin No. 314 gives complete details. Write.

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MACHINE MANUFACTURING COMPANY

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BENDING AND STRAIGHTENING MACHINES

PUNCHING AND SHEARING MACHINERY

less than 5 per cent; and one coat of metallic zinc paint which originally had a top coat of aluminum paint. Also, some paint films have failed and others are 60 per cent or more gone, according to *Paint Progress*, published by the New Jersey Zinc Co.

Copper Plating Process Offers Greater Stability

A high speed copper plating process which reduces operating costs and speeds production has been developed by DuPont Co., Wilmington, Del. Method makes possible further increases in current densities by substituting potassium cyanide and other potassium salts for sodium salts formerly used. Potassium cyanide is costlier, pound for pound, than sodium cyanide, but less is needed to maintain the plating bath at required strength. Dilute solutions of potassium salt are said to give equivalent to stronger concentrations in the old, and desired thickness of deposit now is acquired in shorter plating time. New bath also is more stable and easier to rinse.

The original method, introduced in 1938, plated heavier deposits of copper in a shorter time than had been possible before. It utilized a carefully compounded and controlled sodium copper cyanide bath, operating at 100 per cent current efficiency and at increased current densities.

Special Alloy Features High-Strength, Toughness

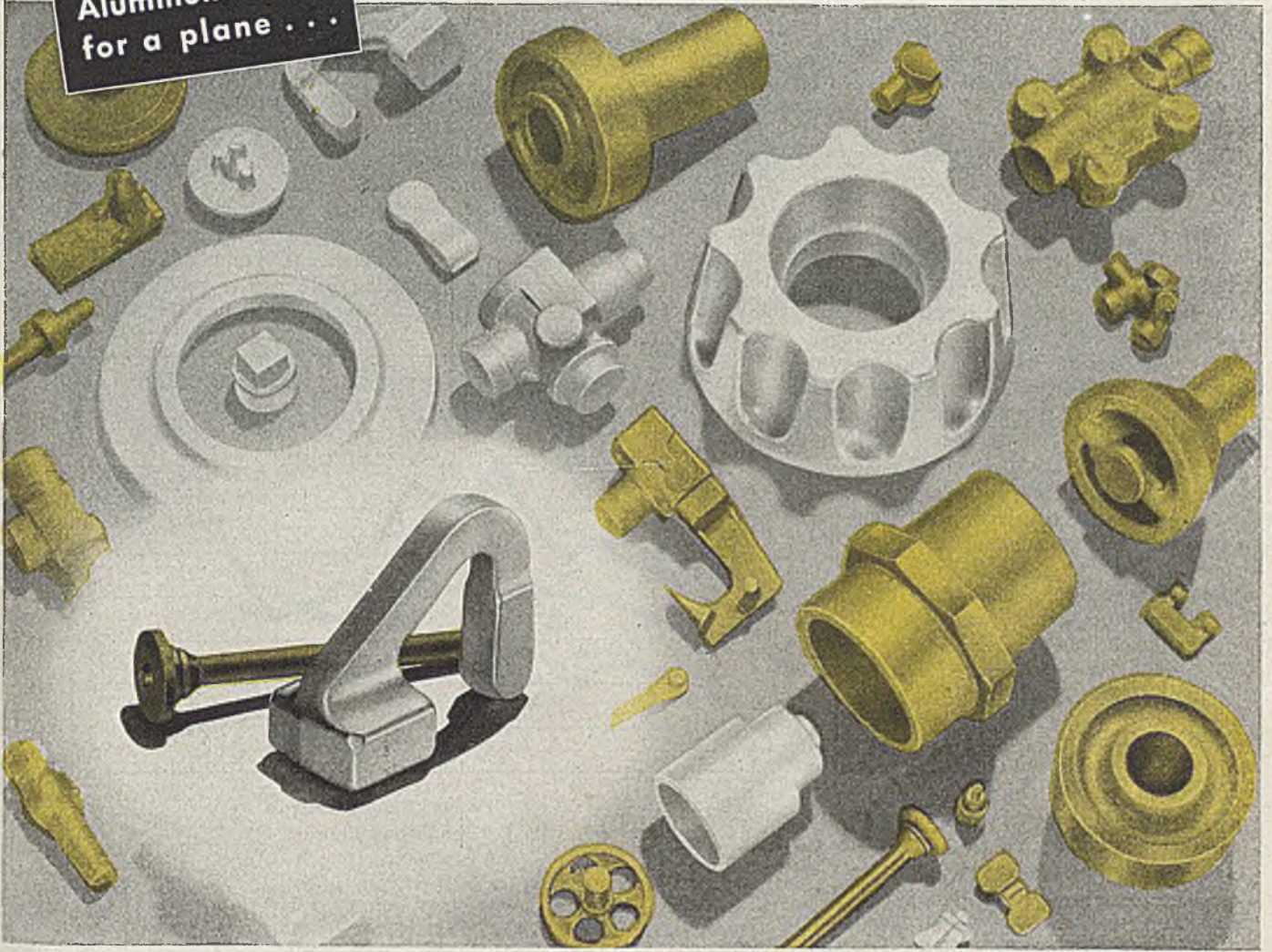
A new, high strength alloy, known as Burndy 113L, for cast, current-carrying parts of electrical connectors has been developed by Burndy Engineering Co. Inc., 107 Bruckner Blvd., New York 54. It is the same as the company's high copper alloy 113, with lithium added. Addition of lithium is said to provide a denser fine-grained casting, with tensile strength increased almost 20 per cent. Elongation also is increased about 20 per cent. Coefficient of friction is reduced, yet these advantages are said to be obtained with little change in electrical conductivity. Electrical connectors cast from this alloy are stronger and tougher, overcoming cracking in service, are more readily conformable to the conductor, and can be installed with greater applied pressure, according to the company.

Steel spring vibration control equipment to increase useful life of large furnaces located adjacent to a battery of forging hammers in a drop forging plant has been developed by Korfund Co. Inc., Long Island City, N. Y. As furnaces are from 20 to 30 feet long, 8 to 10 feet wide, up to 10 feet high and weigh loaded from 150,000 to 200,000 pounds, heavy duty isolators are used.

Brass repair rivet
for a valve . . .
Aluminum "hook"
for a plane . . .

SCOVILL FORGINGS

for close tolerances and extra strength



Repair rivets for valves must combine close tolerances with great strength. So Scovill extrudes them from brass slugs . . . a one-operation process to meet specified tolerances at low cost.

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Whenever you have a problem in metal parts production, follow the lead of more than 3,000 firms who have found that Scovill usually produces better metal parts at the same price or equally good at lower cost. Let Scovill apply to your forgings the ingenious designing and top-notch die-making that have earned for Scovill the title of "Masters of Metal".

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- Household Appliance Parts
- Plumbing Goods (valves, etc.)
- Industrial Instrument Parts
- Aircraft Parts
- Communications Equipment Parts
- General Electrical Product Parts
- Fire Extinguishers
- Cameras
- Oil Burners
- Band Instruments

Other applications.....

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Company

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THE BUSINESS TREND

Optimism Prevails Over Prospects for Business

DESPITE the uncertainties in the business outlook, sentiment is optimistic for the future. Some heavy war contract cancellations have been made since V-E Day. However, cutbacks have not been as severe as had been expected. Consequently, industrial operations continue at a high level and indications are reconversion will have progressed sufficiently by the time war business slumps sharply to give assurance the gap from war to peacetime production will be relatively narrow in most cases.

Steel ingot production remained steady at 93½ per cent of capacity in the latest period, and no noticeable decline is in sight for the summer. Any reduction in war needs of steel will be offset by demand for civilian production.

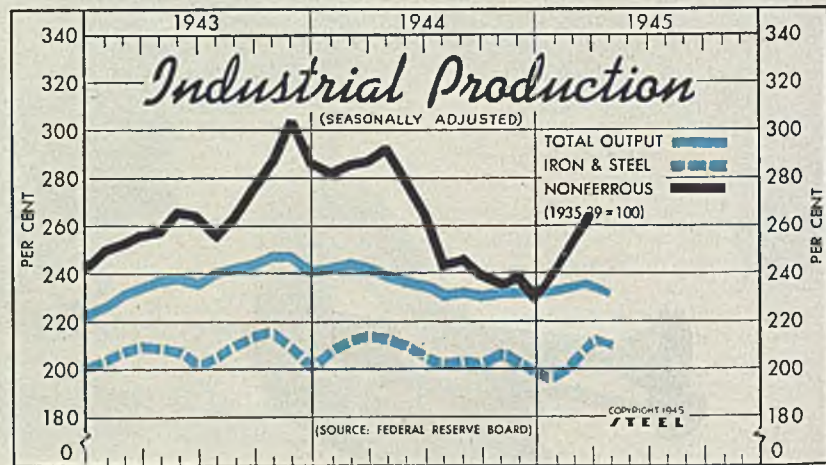
Bituminous coal production continued high in the latest weekly period. A daily average increase in output of 115,000 tons was reported. Estimated production for the week was 11,400,000 tons. The manpower shortage, however, has held coal production down all year. Thus far this year, production totals approximately 227,581,000 tons against 247,428,000 tons in the like period of 1944.

FRB's INDEX — Industrial production, which had advanced earlier this year, declined in April to the same general level that prevailed during the last half of 1944. Activity in the machinery and transportation equipment industries declined about 3 per cent in April, reflecting curtailed munitions production. Largest part of the decrease was accounted for by a further reduction in shipyard operations.

CONSTRUCTION — Civil engineering construction volume in continental United States totals \$35,016,000 for the latest week. This volume is 21 per cent higher than in the preceding week, and 26 per cent above the total for the corresponding 1944 week.

STRUCTURAL STEEL—Bookings for fabricated structural steel for bridge and building construction have continued to show an encouraging gain. Figures for April are larger than for any month since July, 1942. The bookings totaled 94,452 tons in April, compared with 88,740 tons for the preceding month, and 61,498 tons reported for April, 1944. Reported shipments for bridge and building construction totaled 50,701 tons in April, compared with 44,495 tons for the same month in 1944.

LIVING COSTS—Living costs for the average family in the United States rose 0.4 per cent from March to April, according to the National Industrial Conference Board. The board's index was at the highest point for the war period, and the highest since December, 1925. Purchasing power of the dollar, in terms of goods in 1923, was 94.5 cents in April. A year ago it was 96 cents.



Federal Reserve Board's
Production Indexes
(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1945	1944	1945	1944	1945	1944
January	234	243	227	197	208	240
February	236	244	232	202	212	208
March	235	242	235	210	214	210
April	231	239	237	208	213	209
May	...	237	238	...	210	208
June	...	235	236	...	204	201
July	...	231	240	...	202	204
August	...	232	242	...	203	210
September	...	231	244	...	202	214
October	...	232	247	...	206	215
November	...	232	247	...	201	209
December	...	232	241	...	198	200
Average	...	236	239	...	206	208

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)	93.5	93.5	94.0	98.5
Electric Power Distributed (million kilowatt hours)	4,300†	4,377	4,416	4,292
Bituminous Coal Production (daily av.—1000 tons)	1,900	1,785	1,830	2,002
Petroleum Production (daily av.—1000 bbls.)	4,875†	4,867	4,805	4,514
Construction Volume (ENR—unit \$1,000,000)	\$35.0	\$29.0	\$32.3	\$27.9
Automobile and Truck Output (Ward's—number units)	21,010	21,260	20,045	18,260

*Dates on request.

TRADE

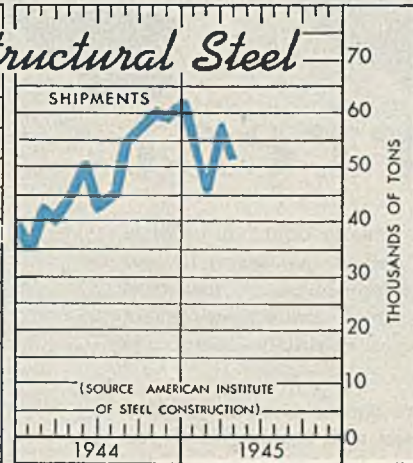
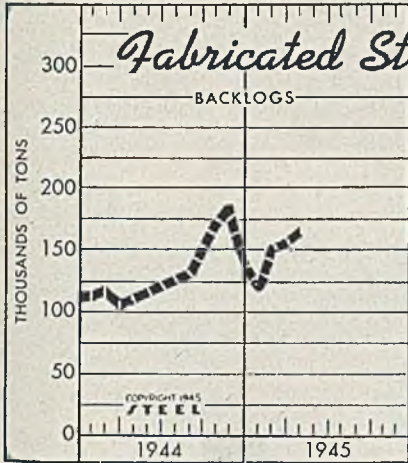
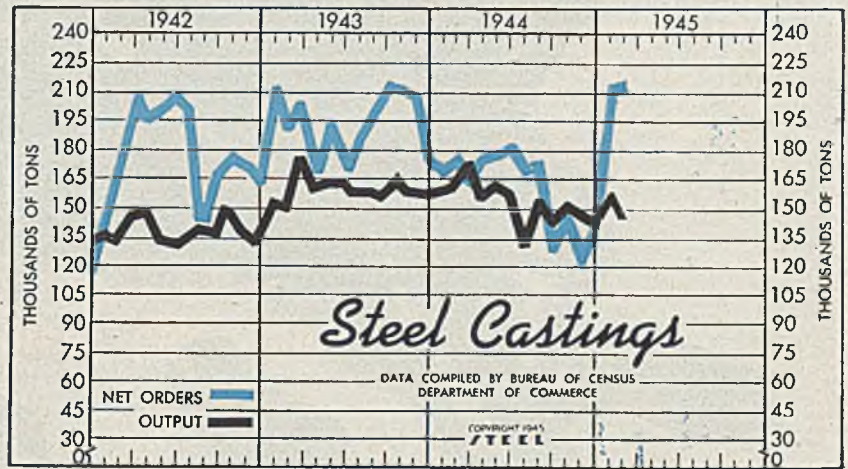
	Latest Period*	Prior Week	Month Ago	Year Ago
Freight Carloadings (unit—1000 cars)	873†	869	899	870
Business Failures (Dun & Bradstreet, number)	15†	15	24	33
Money in Circulation (in millions of dollars)†	\$26,399	\$26,372	\$26,074	\$21,911
Department Store Sales (change from like week a year ago)†	-1%	+5%	+3%	+31%

†Preliminary. †Federal Reserve Board.

Commercial Steel Castings†
(Net tons in thousands)

	Orders		Production	
	1945	1944	1945	1944
Jan.	210.2	167.7	157.2	159.8
Feb.	214.4	173.6	146.2	161.4
Mar. ....	.....	162.6	.....	174.6
Apr. ....	.....	175.1	.....	155.8
May ....	.....	177.0	.....	161.8
June ....	.....	181.8	.....	157.4
July ....	.....	169.9	.....	131.9
Aug. ....	.....	171.3	.....	154.9
Sept. ....	.....	129.8	.....	144.5
Oct. ....	.....	146.1	.....	150.7
Nov. ....	.....	120.7	.....	146.4
Dec. ....	.....	138.7	.....	144.2
Total	159.5	153.6		

†For sale.



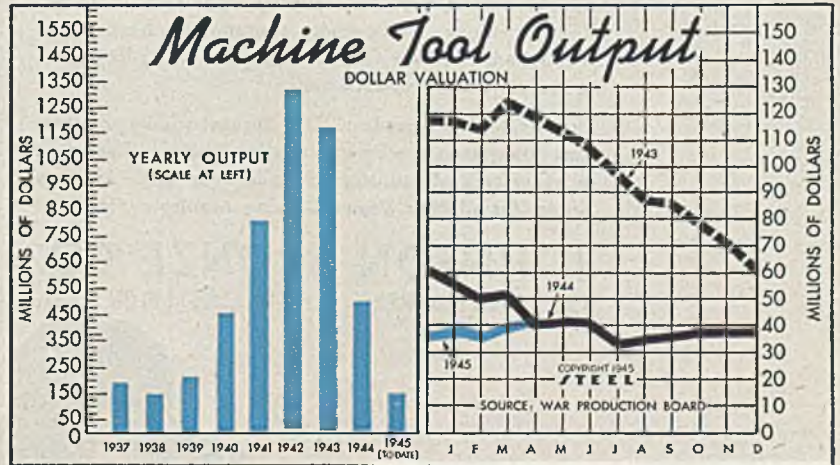
Fabricated Structural Steel
(1000 tons)

	Shipments			Backlogs		
	1945	1944	1943	1945	1944	1943
Jan.	54.5	35.2	91.9	124.4	113.1	339.1
Feb.	47.4	42.9	90.8	151.6	117.6	321.0
Mar.	57.6	41.4	94.0	153.3	106.3	299.8
Apr.	50.7	44.5	86.6	162.5	111.2	272.5
May	50.7	78.9	.....	116.3	220.6	.....
June	43.0	68.4	.....	122.7	207.1	.....
July	45.3	56.8	.....	125.4	201.8	.....
Aug.	55.2	50.2	.....	130.4	195.6	.....
Sept.	57.5	51.8	.....	151.1	208.1	.....
Oct.	61.8	80.1	.....	174.4	274.0	.....
Nov.	59.4	42.7	.....	184.2	134.6	.....
Dec.	61.3	39.6	.....	142.5	113.0	.....

Source: American Institute of Steel Construction. Figures represent members' reports only.

Machine Tool Output
(000 omitted)

	1945	1944	1943	1942
Jan.	\$37,498	\$56,363	\$117,384	\$83,547
Feb.	36,018	50,127	114,594	84,432
Mar.	39,374	51,907	125,445	98,358
Apr.	40,331	41,370	118,024	103,364
May	41,819	41,819	113,859	107,297
June	41,471	108,736	111,000	.....
July	32,753	97,428	113,596	.....
Aug.	35,177	87,405	117,342	.....
Sept.	35,876	85,842	119,883	.....
Oct.	37,516	78,300	130,008	.....
Nov.	36,277	71,811	120,871	.....
Dec.	36,782	60,861	131,960	.....
Year	497,438	1,179,689	1,321,862	812,462
1944 .....	.....	.....	.....	450,000



FINANCE

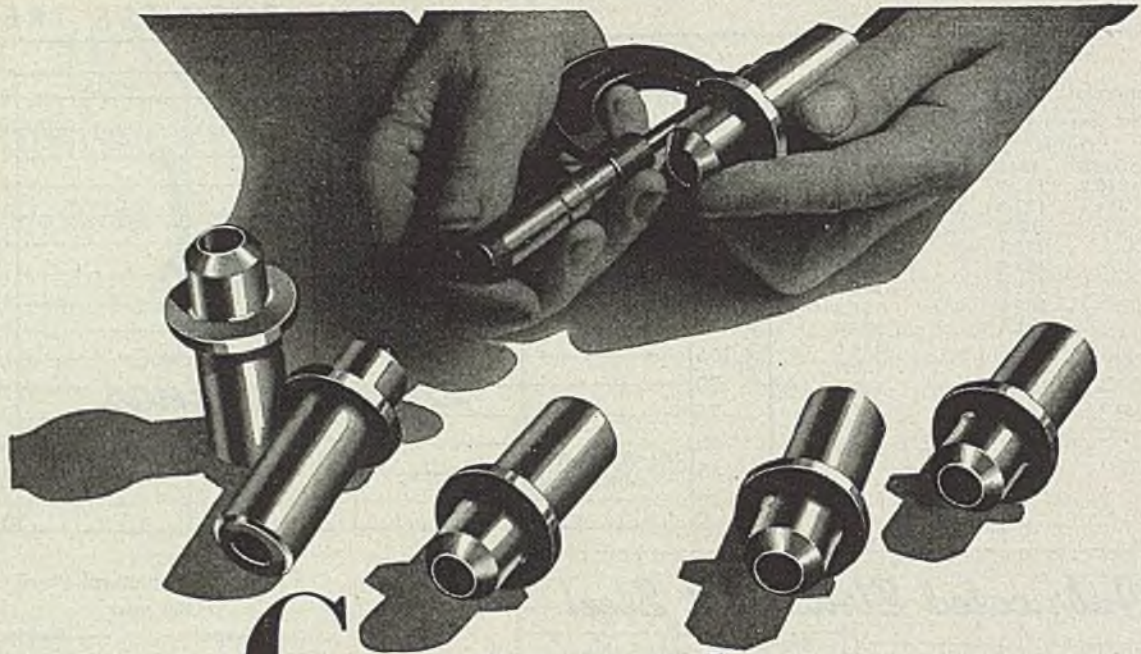
	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—thousands)	\$11,099	\$11,025	\$10,106	\$8,666
Federal Gross Debt (billions)	\$238.2	\$237.3	\$235.7	\$187.7
Bond Volume, NYSE (millions)	\$43.6	\$52.2	\$81.4	\$59.7
Stocks Sales, NYSE (thousands)	6,407	6,724	8,280	4,611
Loans and Investments (billions)†	\$57.2	\$57.0	\$57.3	\$50.3
United States Gov't Obligations Held (millions)†	\$42,853	\$42,748	\$43,143	\$37,232

†Member banks, Federal Reserve System.

PRICES

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average	\$58.27	\$57.55	\$57.55	\$56.78
All Commodities†	105.8	105.7	105.6	103.8
Industrial Raw Materials†	117.9	117.9	117.7	113.3
Manufactured Products†	102.1	102.0	101.9	101.1

†Bureau of Labor's Index, 1926 = 100.



Correct

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NO WONDER

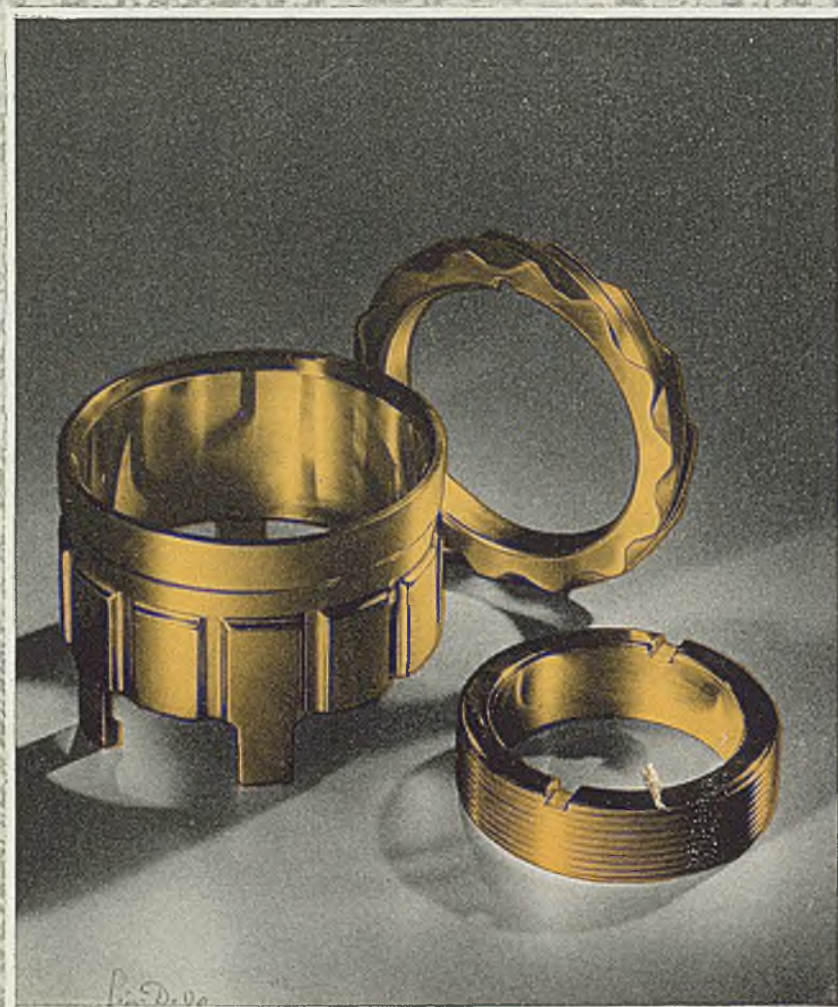
M-H Rolls

break performance records

M-H knows rolling mills—like no one else

Of course, Mack-Hemp knows rolls, *too*. They have originated most of the major roll developments of the United States—but equally important they know mills—*intimately*. As a matter of fact, there are more M-H blooming mills now in operation than all other makes put together. What does all this mean? It means just this—that Mack-Hemp knows exactly which type of roll will do each particular job best. And they also know how to build that particular roll better . . . The importance of this experience may be judged by the fact that M-H Alloy Steel Blooming Mill Rolls are breaking tonnage records in at least 7 different plants.

Mackintosh-Hemphill Company, Pittsburgh & Midland, Pa.



*P*erfection in a Bronze Bearing consists of precision, fine finish, uniform metallurgical and physical properties. Bunting Bronze Bearings today are more perfect than any ever before produced in volume. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Warehouses in principal cities.

Bunting

BRONZE BEARINGS ☆ BUSHINGS ☆ PRECISION BRONZE BARS

Civilian Steel Prospects For Third Quarter Meager

War cancellations have little effect on nearby deliveries . . . Export and lend-lease press for large tonnages . . . Pig iron output slows

PROSPECTS for rolling of much unrated steel during third quarter are not bright, except possibly in plates.

There is a possibility the situation may change in the next few weeks, but is not regarded as probable. Recent cancellations, mainly in Army aircraft, have not been appreciably reflected in steel schedules and effect of military curtailments in the past month has not been as pronounced as had been expected. Influence of cutbacks may become more pronounced by the end of June as Washington is able to appraise needs in the Pacific and estimate how much equipment can be shifted from Europe. Decline in steel backlogs as a result of cutbacks has been moderate and has had relatively little effect on nearby deliveries. Where gaps have appeared they have been filled promptly by other war work or essential civilian requirements.

Under this situation it would not appear there will be any drastic cut in steel output in third quarter, especially in view of the heavy unrated tonnage now pressing for scheduling. However, there may be noticeable decline in steel demand, in view of the many problems of changing to civilian production. Among drawbacks to heavy steel consumption in the transition are difficulties of proper timing of various materials and parts required in manufacturing assemblies or building projects.

Pricing is an important element, as many small manufacturers claim they will not be able to market their normal civilian products at a profit under present high costs and lack resources to carry them until price restrictions may be eased.

Requirements for rehabilitation in Europe are beginning to

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended		Same Week	
	June 2	Change	1944	1945
Pittsburgh	90.5	-1.5	93	98.5
Chicago	97	-1.5	101.5	97
Eastern Pa.	92	None	94	95
Youngstown	80	-9	96	97
Wheeling	89.5	-3	101	94
Cleveland	91	-3	91.5	95.5
Buffalo	90.5	+7	90.5	90.5
Birmingham	90	None	95	100
New England	90	-2	90	95
Cincinnati	84	None	87	94
St. Louis	75	None	74.5	91.5
Detroit	83	-5	89	80
Estimated national rate	91.5	-2	*98.5	*98.5

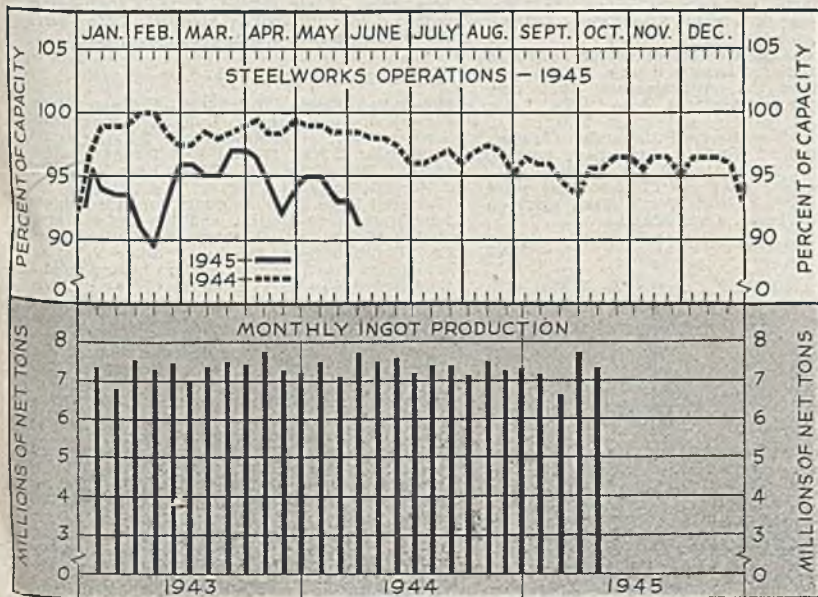
*Based on steelmaking capacities as of these dates.

shape up. At least 20,000 tons of plates have just been distributed under lend-lease for France and 14,000 tons of shapes have been placed with one mill. How much of this type of order will be placed under lend-lease in the next few months is not certain. Third quarter allocations for the Foreign Economic Administration are expected to be slightly heavier than in second quarter, probably averaging about 100,000 tons per month, the larger part going to South American countries and the Near East. Lend-lease requirements are uncertain and unless the recently canceled Russian tonnage is reinstated lend-lease shipments probably will be lighter, in spite of rehabilitation requirements now coming out, particularly for France. On the other hand, should Russia enter the war against Japan movement of lend-lease would be resumed, an important factor in the entire situation.

Steelworks operations last week declined 2 points to 91½ per cent of capacity, because of slight losses in seven of the 12 districts. Buffalo was the only area showing a gain, rising 7 points to 90½ per cent on recovery from a strike interruption. Pittsburgh dropped 1½ points to 90½ per cent, Chicago 1½ points to 97. Wheeling 3 points to 89½, Detroit 5 points to 83, New England 2 points to 90, Youngstown 9 points to 80 and Cleveland 3 points to 91. Rates were unchanged as follows: Cincinnati 84, eastern Pennsylvania 92, Birmingham 90 and St. Louis 75.

Pig iron production in April totaled 4,785,659 net tons, compared with 5,227,790 tons in March and 5,243,410 tons in April, 1944. Cumulative tonnage for four months this year was 19,521,211 tons, against 21,082,127 tons in the comparable period in 1944. Capacity engaged in April was 86.4 per cent, compared with 91.4 in March.

Average composite prices of steel and iron products are steady at Office of Price Administration ceilings except for steelmaking scrap, which is slightly below because of weakness in the East. Finished steel composite is \$58.27, semifinished steel \$37.80 and steelmaking pig iron \$24.05. Steelmaking scrap composite is \$19.00.



COMPOSITE MARKET AVERAGES

	June 2	May 26	May 19	One Month Ago May, 1945	Three Months Ago Mar., 1945	One Year Ago June, 1944	Five Years Ago June, 1940
Finished Steel	\$58.27	\$58.27	\$57.55	\$57.73	\$57.55	\$56.73	\$56.73
Semifinished Steel	37.80	37.80	36.00	36.45	36.00	36.00	36.00
Steelmaking Pig Iron	24.05	24.05	24.05	24.05	23.55	23.05	22.05
Steelmaking Scrap	19.00	19.00	19.17	19.13	19.17	19.17	19.15

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, 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 molting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

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

Finished Material	June 2, 1945	May, 1945	Mar., 1945	June, 1944	Pig Iron	June 2, 1945	May, 1945	Mar., 1945	June, 1944
Steel bars, Pittsburgh	2.25c	2.17c	2.15c	2.15c	Bessemer, del. Pittsburgh	\$26.19	\$26.19	\$26.19	\$25.19
Steel bars, Chicago	2.25	2.17	2.15	2.15	Basic, Valley	24.50	24.50	24.50	23.50
Steel bars, Philadelphia	2.57	2.49	2.47	2.47	Basic, eastern del. Philadelphia	26.34	26.34	26.34	25.34
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 fdry., del. Pitts., N.&S. Sides	25.69	25.69	25.69	24.69
Shapes, Philadelphia	2.215	2.215	2.215	2.215	No. 2 foundry, Chicago	25.00	25.00	25.00	24.00
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2, Birmingham	21.38	21.38	21.38	20.38
Plates, Pittsburgh	2.25	2.22	2.20	2.10	Southern No. 2 del. Cincinnati	25.30	25.30	25.30	24.30
Plates, Philadelphia	2.30	2.26	2.25	2.15	No. 2 fdry., del. Phila.	26.34	26.34	26.34	25.34
Plates, Chicago	2.25	2.22	2.20	2.10	Malleable, Valley	25.00	25.00	25.00	24.00
Sheets, hot-rolled, Pittsburgh	2.20	2.20	2.20	2.10	Malleable, Chicago	25.00	25.00	25.00	24.00
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05	Lake Sup., charcoal, del. Chicago	37.34	37.34	37.34	37.34
Sheets, No. 24 galv., Pittsburgh	3.70	3.65	3.65	3.50	Gray forge, del. Pittsburgh	25.19	25.19	25.19	24.19
Sheets, cold-rolled, Gary	2.20	2.20	2.20	2.10	Ferromanganese, del. Pittsburgh	140.33	140.33	140.33	140.33
Sheets, hot-rolled, Gary	3.05	3.05	3.05	3.05	Scrap				
Sheets, No. 24 galv., Gary	3.70	3.65	3.65	3.50	Heavy melting steel, No. 1 Pittsburgh	\$20.00	\$20.00	\$20.00	\$20.00
Bright bess., basic wire, Pittsburgh	2.75	2.64	2.60	2.60	Heavy melt, steel, No. 2, E. Pa.	18.56	18.75	18.75	18.75
Tin plate, per base box, Pittsburgh	\$5.00	\$5.00	\$5.00	\$5.00	Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Wire nails, Pittsburgh	2.90	2.82	2.80	2.55	Rails for rolling, Chicago	22.25	22.25	22.25	22.25
					No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Semifinished Material					Coke				
Sheet bars, Pittsburgh, Chicago	\$36.00	\$34.50	\$34.00	\$34.00	Connellsville, furnace, ovens	\$7.50	\$7.00	\$7.00	\$7.00
Slabs, Pittsburgh, Chicago	36.00	34.50	34.00	34.00	Connellsville, foundry ovens	8.25	7.75	7.75	7.75
Rerolling billets, Pittsburgh	36.00	34.50	34.00	34.00	Chicago, by-product fdry., del.	13.35	13.35	13.35	13.35
Wire rods, No. 5 to 3/4-inch, Pitts.	2.15	2.05	2.00	2.00					

STEEL, IRON RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941, Feb. 4, 1942 and May 21, 1945. The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. Seconds and off-grade products are also covered. Exceptions applying to individual companies are noted in the table. Finished steel quoted in cents per pound.

Semifinished Steel

Gross ton basis except wire rods, skelp.
Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, \$31.00.

(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at \$33 gross ton, f.o.b. mill Kaiser Co. Inc., \$43, f.o.b. Pacific ports.)

Alloy Steel Ingots: Pittsburgh, Chicago, Cleveland, Bethlehem, Canton, Massillon; uncorp., \$45.
Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$36; Detroit, del. \$38; Duluth (bill) \$38; Pac. Ports, (bill) \$48. (Andrews Steel Co., carbon slabs \$41; Continental Steel Corp., billets \$34, Kokomo, to Acme Steel Co.; Northwestern Steel & Wire Co., \$41, Sterling, Ill.; Laclede Steel Co. \$34, Alton or Madison, Ill.; Wheeling Steel Corp. \$36 base, billets for lead-lease, \$34, Portsmouth, O., on slabs on WPB directives. Granite City Steel Co. \$47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., Kaiser Co. Inc., \$38.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$42; Detroit, del. \$44; Duluth, billets, \$44; forg. bil. f.o.b. Pac. ports, \$54.

(Andrews Steel Co. may quote carbon forging billets \$50 gross ton at established basing points; Follansbee Steel Corp., \$49.50 f.o.b. Toronto, O. Geneva Steel Co., Kaiser Co. Inc., \$34.64, Pacific ports.)

Open Hearth Shell Steel: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Youngstown, Birmingham, base 1000 tons one size and section; 3-12 in., \$52; 12-18 in., excl., \$54.00; 18 in. and over \$56. Add \$2.00 del. Detroit; \$3.00 del. Eastern Mich. (Kaiser Co. Inc., \$76.64, f.o.b. Los Angeles).

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$54; del. Detroit \$56, Eastern Mich. \$57.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$36. (Wheeling Steel Corp. \$37 on lead-lease sheet bars, \$38 Portsmouth, O., on WPB directives; Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, \$39, f.o.b. mill.) Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, Ib., 1.90c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—3/4 in. inclusive, per 100 lbs., \$2.15. Do., over 3/4—1 1/4 in., incl. \$2.30; Galveston, base, 2.25c and 2.40c, respectively. Worcester add \$0.10; Pacific ports \$0.50. (Pittsburgh Steel Co., \$0.20 higher.)

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3": Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham base 20 tons one size, 2.25c; Duluth, base 2.35c; Mahoning Valley 2.324c; Detroit, del. 2.35c; Eastern Mich. 2.40c; New York del. 2.58c; Phila. del. 2.37c; Gulf Ports, dock 2.62c; Pac. ports, dock 2.90c. (Calumet Steel Division, Borg Warner Corp., and Joslyn Mfg. & Supply Co. may quote 2.35c, Chicago base; Sheffield Steel Corp., 2.75c, f.o.b. St. Louis.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons. (Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.)

Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c; Detroit, del., 2.80c. (Texas Steel Co. may use Chicago base price as maximum f.o.b. Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	\$0.10	4100	(.15-.25 Mo) 0.70 (.20-.30 Mo) 0.73
2300	1.70	4300	1.70
2500	2.55	4600	1.20
3000	0.50	4800	2.15
3100	0.85	5100	0.35
3200	1.35	5130 or 5152	0.45
3400	3.20	6120 or 6152	0.95
4000	0.45-0.55	6145 or 6150	1.20

*Add 0.25 for acid open-hearth; 0.50 electric. Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70c; Toledo 2.80c. (Keystone Drawn Steel Co. may sell outside its usual market area on Proc. Div., Treasury Dept. contracts at 2.65c, Spring City, Pa., plus freight on hot-rolled bars from Pittsburgh to Spring City. New England Drawn Steel Co. may sell outside New England on WPB direc-

tives at 2.65c, Mansfield, Mass., plus freight on hot-rolled bars from Buffalo to Mansfield.)

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.45c; Eastern Mich. 3.50c.

Reinforcing Bars (New Unit): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.25c; Eastern Mich. and Toledo 2.30c; Gulf ports, dock 2.50c; Pacific ports, dock 2.35c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo base 2.15c; Detroit, del. 2.25c; Eastern Mich. and Toledo 2.30c; Gulf ports, dock 2.50c.

Iron Bars: Single refined, Pitts. 4.40c; double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, single ref., 5.00c, double ref., 6.25c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.90c; Granite City, base 2.90c; Detroit del. 2.90c; Eastern Mich. 2.35c; Phila. del. 2.37c; New York del. 2.44c; Pacific ports 2.75c.

(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 2.35c on hot carbon sheets, nearest eastern basing point.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.15c; Eastern Mich. 3.20c; New York del. 3.39c; Phila. del. 3.37c; Pacific ports 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.70c; Granite City, base 3.80c; New York del. 3.94c; Phila. del. 3.87c; Pacific ports 4.25c.

(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.35c. Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; Granite City 3.70c; Pacific ports 4.25c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.25c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 2.85c; Granite City, base 2.95c; Detroit, del. 2.95c; eastern Mich. 3.00c; Pacific ports 3.50c; 20-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.45c; Detroit, del. 3.55c; eastern Mich. 3.60c; Pacific ports 4.10c.

Electrical Sheets No. 24:

	Pittsburgh	Pacific	Granite
	Base	Ports	City
Field grade	3.30c	4.05c	3.30c
Armature	3.65c	4.40c	3.75c
Electrical	4.15c	4.90c	4.25c
Motor	5.05c	5.80c	5.15c
Dynamo	5.75c	6.50c	5.85c

Transformer:

62	6.25c	7.00c	.....
75	7.25c	8.00c	.....
58	7.75c	8.50c	.....
52	8.55c	9.30c	.....

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; Eastern Mich. 2.25c; Pacific ports 2.75c. (Joslyn Mfg. Co. may quote 2.30c, Chicago base.)
Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.90c; Eastern Mich. 2.95c; Worcester base 3.00c.
Commodity C. R. Strip: Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; Chicago 3.05c; Detroit del. 3.05c; Eastern Mich. 3.10c; Worcester base 3.35c.
Cold-Finished Spring Steel: Pittsburgh, Cleveland bases, add 20c for Worcester; .26-.50 Carb., 2.80c; .51-.75 Carb., 4.30c; .76-1.00 Carb., 6.15c; over 1.00 Carb., 8.35c.

Tin, Terne Plate
Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, \$5.00; Granite City \$5.10.
Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb. base box, 0.50 lb. tin, \$4.50; 0.75 lb. tin \$4.65.
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, Chicago, Gary, No. 24 unassorted 3.80c; Pacific ports 4.55c.
Manufacturing Ternes: (Special Coated) 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; 15-lb. \$14.00; 20-lb. \$15.00; 25-lb. \$16; 30-lb. \$17.25; 40-lb. \$19.50.

Plates
Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.25c; New York, del. 2.44c; Phila., del. 2.30c; St. Louis, 2.49c; Boston, del. 2.57-82c; Pacific ports, 2.80c; Gulf ports, 2.60c.
(Granite City Steel Co. may quote carbon plates 2.35c f.o.b. mill; 2.65c f.o.b. D.P.C. mill; Kaiser Co. Inc., 3.20c, f.o.b. Los Angeles.
Central Iron & Steel Co. 2.50c f.o.b. basing points; Geneva Steel Co., Provo, Utah, 3.20c, f.o.b. Pac. ports.)
Floor Plates: Pittsburgh, Chicago, 3.50c; Pacific ports, 4.15c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c; Gulf ports 3.95c; Pacific ports 4.15c.
Wrought Iron Plates: Pittsburgh, 3.80c.

Shapes
Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del. 2.27c; Phila., del. 2.215c; Pacific ports, 2.75c.
(Phoenix Iron Co., Phoenixville, Pa., may quote carbon steel shapes at 2.35c at established basing points and 2.50c, Phoenixville, for export; Sheffield Steel Corp., 2.35c f.o.b. St. Louis, Geneva Steel Co., 3.25c, Pac. ports.)
Kaiser Co. Inc., 3.20c f.o.b. Los Angeles).
Steel Sheet Piling: Pittsburgh, Chicago, Buffalo, 2.40c.

Wire Products, Nails
Wire: Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add \$2 for Worcester, \$1 for Duluth).
Bright basic, bessemer wire 2.75c
Spring wire 3.20c
(Pittsburgh Steel Co., 0.20c higher.)
Wire Products to the Trade:
Standard and Cement-coated wire nails, and staples, 100-lb. keg, Pittsburgh, Chicago, Birmingham, Cleveland, Duluth \$2.90; galvanized, \$2.55; Pacific ports \$3.40 and \$3.05
Annealed fence wire 100-lb., Pittsburgh, Chicago, Cleveland 3.20c
Galvanized fence wire, 100 lb., Pittsburgh, Chicago, Cleveland 3.55c
Woven fence, 15 1/2 gage and heavier, per base column 67c
Barbed wire, 80-rod spool, Pittsburgh, Chicago, Cleveland, Birmingham, column 70; twisted business wire, column 70.

Tubular Goods
Welded Pipe: Base price in carloads, threaded and coupled to consumers about \$200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

and coupled to consumers about \$200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld						
In.	Steel			Iron		
	Blk.	Galv.	In.	Blk.	Galv.	
1/2	56	33	1/2	24	3 1/2	
3/4 & 1	59	40 1/2	3/4	30	10	
1 1/4	63 1/2	51	1-1 1/4	34	16	
1 3/4	66 1/2	55	1 1/2	38	18 1/2	
1-3	68 1/2	57 1/2	2	37 1/2	18	

Lap Weld						
In.	Steel			Iron		
	Blk.	Galv.	In.	Blk.	Galv.	
2	61	49 1/2	1 1/4	23	3 1/2	
2 1/2-3	64	54 1/2	1 1/2	28 1/2	10	
3 1/2-6	66	54 1/2	2	30 1/2	12	
7-8	65	52 1/2	2 1/2, 3 1/2	31 1/2	14 1/2	
9-19	64 1/2	52	4	33 1/2	18	
11-12	63 1/2	51	4 1/2-8	32 1/2	17	
			9-12	28 1/2	12	

Boiler Tubes: Net base prices per 100 feet f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D. Sizes	—Seamless—				Steel	Char-coal Iron
	B.W.G	Hot Rolled	Cold Drawn	Steel		
1"	13	\$ 7.82	\$ 9.01	.....	.....
1 1/4"	13	9.26	10.67	.....	.....
1 1/2"	13	10.23	11.72	\$ 9.72	\$23.71	
1 3/4"	13	11.64	13.42	11.06	22.93	
2"	13	13.04	15.03	12.38	19.35	
2 1/4"	13	14.54	16.76	13.79	21.63	
2 1/2"	12	16.01	18.45	15.16	.....
2 3/4"	12	17.54	20.21	16.58	26.57	
3"	12	18.59	21.42	17.54	29.00	
3 1/2"	12	19.50	22.48	18.35	31.38	
4"	11	24.63	28.37	23.15	39.81	
4 1/2"	10	30.54	35.20	28.66	49.90	
5"	10	37.35	43.04	35.22	.....
5 1/2"	9	46.87	54.01	44.25	73.93	
6"	7	71.96	82.93	68.14	.....

Rails, Supplies
Standard rails, over 60-lb., f.o.b. mill, gross ton, \$43.00. Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, \$45.00.
*Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, \$31-\$33.
Supplies: Track bolts, 4.75c; heat treated, 5.00c. Tie plates, \$46 net ton, base, Standard spikes, 3.25c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.
Tool Steels
Tool Steels: Pittsburgh, Bethlehem, Syracuse, base, cents per lb.; Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.

Tung.	Chr.	Van.	Moly.	Pitts. base per lb.
18.00	4	1	.....	67.00c
1.5	4	1	8.5	54.00c
.....	4	2	8	54.00c
5.50	4	1.50	4	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels
Base, Cents per lb.—f.o.b. Pittsburgh

CHROMIUM NICKEL STEEL					
Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	28.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
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
312	36.00	40.00	49.00	.....	.....
*316	40.00	44.00	48.00	40.00	48.00
†321	29.00	34.00	41.00	29.25	38.00
†347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50

STRAIGHT CHROMIUM STEEL					
Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
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
440A	24.00	28.50	33.50	23.75	36.50
442	22.50	25.50	32.50	24.00	32.00
443	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

STAINLESS CLAD STEEL (20%)
304..... \$18.00 19.00

*With 2-3% moly. †With titanium. ‡With columbium. **Plus machining agent. ††High carbon. †††Free machining. ††††Includes annealing and pickling.
Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under

(1) except to the extent prevailing in third quarter of 1940.

Extras mean additions or deductions from base prices in effect April 16, 1941.

Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.

Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price.

Seconds, maximum prices: flat-rolled rejects 75% of prime prices, wasters 75%, waste-wasters 65% except plates, which take waster prices; tin plate \$2.80 per 100 lbs.; terne plate \$2.25; semifinished 85% of primes; other grades limited to new material ceilings.

Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941.

Bolts, Nuts

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

Carriage and Machine
1/2 x 6 and smaller 65 1/2 off
Do., 3/4 and 5/8 x 6-in. and shorter 63 1/2 off
Do., 1/2 to 1 x 6-in. and shorter 61 off
1 1/2 and larger, all lengths 59 off
All diameters, over 6-in. long 59 off
Tire bolts 50 off
Step bolts 56 off
Flow bolts 65 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.

Nuts		
Semifinished hex	U.S.S.	S. A. E.
1/2-inch and less	62	64
5/8-1-inch	59	60
1 1/8-1 1/2-inch	57	58
1 3/4 and larger	56	.....

Hexagon Cap Screws
Upset 1-in., smaller 64 off
Milled 1-in., smaller 60 off

Square Head Set Screws
Upset, 1-in., smaller 71 off
Headless, 1/4-in., larger 60 off
No. 10, smaller 70 off

Piling

Pittsburgh, Chicago, Buffalo 2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham
Structural 3.75c
1/2-inch and under 65-5 off
Wrought Washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers i.e.l. \$2.75-3.00 off

Metallurgical Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, furnace	*7.50
Connellsville, foundry	8.00-8.50
New River, foundry	9.00-9.25
Wise county, foundry	7.75-8.25
Wise county, furnace	7.25-7.75

By-Product Foundry	
Kearney, N. J., ovens	12.66
Chicago, outside delivered	12.60
Chicago, delivered	13.36
Terre Haute, delivered	13.19
Milwaukee, ovens	13.36
New England, delivered	14.25
St. Louis, delivered	113.36
Birmingham, delivered	10.50
Indianapolis, delivered	13.19
Cincinnati, delivered	12.86
Cleveland, delivered	12.80
Buffalo, delivered	13.00
Detroit, delivered	13.36
Philadelphia, delivered	12.83

*Operators of hand-drawn ovens using trucked coal may charge \$8.00, effective May 26, 1945. †13.85 from other than Ala., Mo., Tenn.

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	11.85c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls., to jobbers	2.00c
Per ton, bulk, f.o.b. port	.....
Sulphate of ammonia	\$29.20

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras.

	Hot rolled bars	Structural shapes	Plates	Floor plates	Hot rolled sheets (10 gage base)	Hot rolled bands (12 gage and heavier)	Hot rolled hoops (14 gage and lighter)	Galvanized flat sheets (24 gage base)	Cold-rolled sheets (17 gage base)	Cold finished bars	Cold-rolled strip	NE hot bars 8600 series	NE hot bars 9400 series
Boston	4.044 ¹	3.912 ¹	3.912 ¹	5.727 ¹	3.774 ¹	4.106 ¹	5.106 ¹	5.224 ¹⁴	4.744 ¹⁴	4.144 ¹¹	4.715	6.012 ²³	6.012 ²³
New York	3.853 ¹	3.758 ¹	3.768 ¹	5.574 ¹	3.590 ¹	3.974 ¹	3.974 ¹	5.010 ¹²	4.613 ¹⁴	4.103 ²¹	4.774		
Jersey City	3.853 ¹	3.747 ¹	3.768 ¹	5.574 ¹	3.590 ¹	3.974 ¹	3.974 ¹	5.010 ¹²	4.613 ¹⁴	4.103 ²¹	4.774		
Philadelphia	3.822 ¹	3.666 ¹	3.605 ¹	5.272 ¹	3.518 ¹	3.922 ¹	4.272 ¹	5.018 ¹⁵	4.872 ²⁵	4.072 ²¹	4.772	5.816 ²³	5.860 ²³
Baltimore	3.802 ¹	3.759 ¹	3.594 ¹	5.252 ¹	3.394 ¹	3.902 ¹	4.252 ¹	4.894 ¹	4.852 ²⁵	4.052 ²¹			
Washington	3.941 ¹	3.930 ¹	3.796 ¹	5.341 ¹	3.596 ¹	4.041 ¹	4.391 ¹	5.196 ¹⁷	4.841 ²⁰	4.041 ²¹			
Norfolk, Va.	4.065 ¹	4.002 ¹	3.971 ¹	5.465 ¹	3.771 ¹	4.165 ¹	4.515 ¹	5.371 ¹⁷	4.965 ²⁴	4.165 ²¹			
Bethlehem, Pa.		3.45 ¹											
Claymont, Del.			3.45 ¹										
Coatesville, Pa.			3.45 ¹										
Buffalo (city)	3.35 ¹	3.40 ¹	3.63 ¹	5.26 ¹	3.35 ¹	3.819 ¹	3.819 ¹	4.75 ¹⁵	4.40 ¹⁰	3.75 ²¹	4.669	5.60 ²³	5.75 ²²
Buffalo (country)	3.25 ¹	3.30 ¹	3.30 ¹	4.90 ¹	3.25 ¹	3.81 ¹	3.50 ¹	4.65 ¹⁵	4.30 ¹⁰	3.65 ²¹	4.35	5.60 ²³	5.75 ²²
Pittsburgh (city)	3.35 ¹	3.40 ¹	3.40 ¹	5.00 ¹	3.35 ¹	3.60 ¹	3.60 ¹	4.75 ¹⁵	4.40 ²⁴	3.75 ²¹			
Pittsburgh (country)	3.25 ¹	3.30 ¹	3.30 ¹	4.90 ¹	3.25 ¹	3.50 ¹	3.50 ¹	4.65 ¹⁵	4.30 ²⁴	3.65 ²¹			
Cleveland (city)	3.35 ¹	3.588 ¹	3.40 ¹	5.188 ¹	3.35 ¹	3.60 ¹	3.60 ¹	4.877 ¹⁵	4.40 ²⁴	3.75 ²¹	4.45 ²¹	5.60 ²³	5.65 ²²
Cleveland (country)	3.25 ¹		3.30 ¹		3.25 ¹	3.50 ¹	3.50 ¹		4.30 ²⁴	3.65 ²¹	4.35 ²¹		
Detroit	3.450 ¹	3.661 ¹	3.609 ¹	5.281 ¹	3.450 ¹	3.700 ¹	3.700 ¹	5.000 ¹²	4.500 ²¹	3.800 ²¹	4.659	5.93 ²³	5.93 ²³
Omaha (city, delivered)	4.115 ¹	4.165 ¹	4.165 ¹	5.765 ¹	3.865 ¹	4.215 ¹	4.215 ¹	5.608 ¹⁹	5.443 ²⁴	4.443 ¹²			
Omaha (country, base)	4.015 ¹	4.065 ¹	4.065 ¹	5.665 ¹	3.765 ¹	4.115 ¹	4.115 ¹	5.508 ¹⁹				6.10	6.20
Cincinnati	3.611 ¹	6.391 ¹	3.661 ¹	5.291 ¹	3.425 ¹	3.675 ¹	3.675 ¹						
Youngstown, O.					3.25 ¹	3.50 ¹	3.50 ¹	4.40 ¹³					
Middletown, O.					3.25 ¹	3.50 ¹	3.50 ¹	4.65 ¹⁶					
Chicago (city)	3.50 ¹	3.55 ¹	3.55 ¹	5.15 ¹	3.25 ¹	3.60 ¹	3.60 ¹	5.231 ¹⁵	4.20 ²⁴	3.75 ²¹	4.65	5.75 ²³	5.85 ²³
Milwaukee	3.637 ¹	3.687 ¹	3.687 ¹	5.287 ¹	3.387 ¹	3.737 ¹	3.737 ¹	5.272 ¹⁵	4.337 ²⁴	3.887 ²¹	4.787	5.987 ²³	6.087 ²³
Indianapolis	3.58 ¹	3.63 ¹	3.63 ¹	5.23 ¹	3.518 ¹	3.768 ¹	3.768 ¹	4.918 ¹⁵	4.568 ²⁴	3.92 ²¹	4.78	6.08 ²³	6.18 ²³
St. Paul	3.76 ²	3.81 ²	3.81 ²	5.41 ²	3.51 ²	3.86 ²	3.86 ²	5.257 ¹⁵	4.46 ²⁴	4.361 ²¹	5.102	6.09 ²³	6.19 ²³
St. Louis	3.647 ¹	3.697 ¹	3.697 ¹	5.297 ¹	3.397 ¹	3.747 ¹	3.747 ¹	5.172 ¹⁵	4.347 ²⁴	4.031 ²¹	4.931	6.131 ²³	6.231 ²³
Memphis, Tenn.	4.015 ⁵	4.065 ⁵	4.065 ⁵	5.78 ⁵	3.965 ⁵	4.215 ⁵	4.215 ⁵	5.265 ¹⁵	4.443 ²⁴	4.33 ²¹			
Birmingham	3.50 ¹	3.55 ¹	3.55 ¹	5.903 ¹	3.45 ¹	3.70 ¹	3.70 ¹	4.75 ¹⁵	4.852 ²⁴	4.54	5.215		
New Orleans (city)	4.10 ¹	3.90 ¹	3.90 ¹	5.85 ¹	4.058 ¹	4.20 ¹	4.20 ¹	5.25 ²⁰	5.079 ¹⁰	4.60 ²¹	5.429		
Houston, Tex.	3.75 ³	4.25 ³	4.25 ³	5.50 ³	3.763 ³	4.313 ³	4.313 ³	5.313 ²⁰	4.10 ¹⁰	3.65 ²²			
Los Angeles	4.40 ¹	4.65 ⁴	4.95 ⁴	7.20 ⁴	5.00 ¹	4.95 ⁴	6.75 ⁴	6.00 ¹²	7.20 ⁶	5.583 ²²	5.613	5.85 ²³	5.95 ²³
San Francisco	4.15 ⁷	4.35 ⁷	4.65 ⁷	6.35 ⁷	4.55 ⁷	4.50 ⁷	5.75 ⁷	6.35 ¹⁵	7.30 ¹⁵	5.333 ²¹	7.333	8.304 ²³	8.404 ²³
Portland, Ore.	4.45 ²⁷	4.45 ²⁷	4.75 ²⁷	6.50 ²⁷	4.65 ²⁷	4.75 ²⁷	6.30 ²⁷	5.75 ¹⁵	6.60 ¹⁵	5.533 ¹⁵			
Tacoma	4.35 ⁸	4.45 ⁸	4.75 ⁸	6.50 ⁸	4.65 ⁸	4.25 ⁸	5.45 ⁸	5.95 ¹⁵	7.60 ¹⁵	5.783 ²¹			8.00 ²³
Seattle	4.35 ⁸	4.45 ⁸	4.75 ⁸	6.50 ⁸	4.65 ⁸	4.25 ⁸	5.45 ⁸	5.95 ¹⁵	7.05 ¹⁵	5.783 ²¹			8.00 ²³

¹Basing point cities with quotations representing mill prices, plus warehouse spread.
NOTE—All prices fixed by Office of Price Administration in Amendments Nos. 10 to 18 to Revised Price Schedule No. 49. Deliveries outside above cities computed in accordance with regulations.

BASE QUANTITIES

¹400 to 1999 pounds; ²400 to 14,999 pounds; ³any quantity; ⁴300 to 1999 pounds; ⁵400 to 8999 pounds; ⁶300 to 9999 pounds; ⁷400 to 39,999 pounds; ⁸under 2000 pounds; ⁹under 4000 pounds; ¹⁰500 to 1499 pounds; ¹¹one bundle to 39,999 pounds; ¹²150 to 2249 pounds; ¹³150 to 1499 pounds; ¹⁴three to 24 bundles; ¹⁵450

to 1499 pounds; ¹⁶one bundle to 1499 pounds; ¹⁷one to nine bundles; ¹⁸one to six bundles; ¹⁹100 to 749 pounds; ²⁰300 to 1999 pounds; ²¹1500 to 39,999 pounds; ²²1500 to 1999 pounds; ²³1000 to 39,999 pounds; ²⁴400 to 1499 pounds; ²⁵1000 to 1999 pounds; ²⁶under 25 bundles, Cold-rolled strip, 2000 to 39,999 pounds, base; ²⁷300 to 4999 pounds.

Ores		Indian and African	Rhodesian	Provo, Utah, and Pueblo, Colo., 91.0c; prices include duty on imported ore and are subject to premiums, penalties and other provisions of amended M.P.R. No. 248, effective as of May 15. Price at basing points which are also points of discharge of imported manganese ore is f.o.b. cars, shipside, at dock most favorable to the buyer.
Lake Superior Iron Ore		48% 2.8:1	45% no ratio	28.30
Gross ton. 51 1/2% (Natural)		48% 3:1	48% no ratio	31.00
Lower Lake Ports		48% no ratio	48% 3:1 lump	43.50
Old range bessemer	\$4.75		Domestic (seller's nearest rail)	
Mesabi nonbessemer	4.45		48% 3:1	52.80
High phosphorus	4.35	South African (Transvaal)	less \$7 freight allowance	
Mesabi bessemer	4.60	44% no ratio		
Old range nonbessemer	4.60	45% no ratio		
		48% no ratio		
		50% no ratio		
Eastern Local Ore			Manganese Ore	
Cents, units, del. E. Pa.			Sales prices of Metals Reserve Co., cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85.0c; Fontana, Calif.,	
Foundry and basic 56-63% contract	13.00	Brazilian—nominal		
Foreign Ore		44% 2.5:1 lump		
Cents per unit, c.i.f. Atlantic ports		48% 3:1 lump		
Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.			
N. African low phos.	Nom.			
Spanish, No. African basic, 50 to 60%	Nom.			
Brazil iron ore, 68-89% f.o.b. Rio de Janeiro	7.50-8.00			
Tungsten Ore		(Extras for alloy content)		
Chinese wolframite, per short ton unit, duty paid	\$24.00	Designation	Chemical Composition Limits, Per Cent	Basic open-hearth Electric furnace
				Bars per 100 lb. Billets per CT. Bars per 100 lb. Billets per GT.
		NE 8612	.10-.15 .70-.90 .20-.35 .40-.60 .40-.70 .15-.25	\$0.85 \$13.00 \$1.15 \$23.00
		NE 8720	.13-.23 .70-.90 .20-.35 .40-.60 .40-.70 .20-.30	.70 14.00 1.20 24.00
		NE 9415	.13-.18 .80-1.10 .20-.35 .30-.50 .30-.60 .08-.15	.75 15.00 1.25 25.00
		NE 9425	.23-.28 .80-1.20 .20-.35 .30-.50 .30-.60 .08-.15	.75 15.00 1.25 25.00
		NE 9442	.40-.45 1.00-1.30 .20-.35 .30-.50 .30-.60 .08-.15	.80 16.00 1.30 26.00
		NE 9722	.20-.25 .50-.80 .20-.35 .10-.25 .40-.70 .15-.25	.65 13.00 1.15 23.00
		NE 9850	.28-.33 .70-.90 .20-.35 .70-.90 .85-1.15 .20-.30	1.30 26.00 1.80 36.00
		NE 9912	.10-.15 .50-.70 .20-.35 .40-.60 1.00-1.30 .20-.30	1.20 24.00 1.55 31.00
		NE 9920	.18-.23 .50-.70 .20-.35 .40-.60 1.00-1.30 .20-.30	1.20 24.00 1.55 31.00
Chrome Ore (Equivalent OPA schedules): Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Ore., or Tacoma, Wash.				
(S/S paying for discharging; dry basis; subject to penalties if guarantees are not met.)		Extras are in addition to a base price of 2.70c, per pound on finished products and \$54 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.		

Pig Iron

Prices (In gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941, amended Feb. 14, 1945. Exceptions indicated in footnotes. Base prices hold face, delivered light face. Federal tax on freight charges, effective Dec. 1, 1942, not included in following prices.

	Foundry	Basic	Bessemer	Mal-leable
Bethlehem, Pa., base	\$26.00	\$25.50	\$27.00	\$26.50
Newark, N. J., del.	27.53	27.03	28.53	28.03
Brooklyn, N. Y., del.	28.50	28.00	29.50	29.00
Birdsboro, Pa., base	26.00	25.50	27.00	26.50
Birmingham, base	†21.38	†20.00	26.00	25.50
Baltimore, del.	26.61	26.11	27.61	27.11
Boston, del.	26.12	25.62	26.62	26.12
Chicago, del.	25.22	24.72	25.72	25.22
Cincinnati, del.	25.06	24.56	25.56	25.06
Cleveland, del.	25.12	24.62	25.62	25.12
Newark, N. J., del.	27.15	26.65	27.65	27.15
Philadelphia, del.	26.46	25.96	26.96	26.46
St. Louis, del.	25.12	24.62	25.62	25.12
Buffalo, base	25.00	24.00	26.00	25.50
Boston, del.	26.50	26.00	27.50	27.00
Rochester, del.	26.53	26.03	27.53	27.03
Syracuse, del.	27.08	26.58	28.08	27.58
Chicago, base	25.00	24.50	25.50	25.00
Milwaukee, del.	26.10	25.60	26.60	26.10
Muskegon, Mich., del.	28.19	27.69	28.69	28.19
Cleveland, base	25.00	24.50	25.50	25.00
Akron, Canton, O., del.	26.39	25.89	26.89	26.39
Detroit, base	25.00	24.50	25.50	25.00
Saginaw, Mich., del.	27.31	26.81	27.81	27.31
Duluth, base	25.50	25.00	26.00	25.50
St. Paul, del.	27.63	27.13	28.13	27.63
Erie, Pa., base	25.00	24.50	26.00	25.50
Everett, Mass., base	26.00	25.50	27.00	26.50
Boston, del.	26.50	26.00	27.50	27.00
Granite City, Ill., base	25.00	24.50	25.50	25.00
St. Louis, del.	25.50	25.00	26.00	25.50
Hamilton, O., base	25.00	24.50	25.50	25.00
Cincinnati, del.	25.44	25.11	26.11	25.88
Neville Island, Pa., base	25.00	24.50	25.50	25.00
†Pittsburgh, del.				
No. & So. sides	25.69	25.19	26.19	25.69
Provo, Utah, base	23.00	22.50	23.50	23.00
Sharpsville, Pa., base	25.00	24.50	25.50	25.00
Sparrows Point, base	26.00	25.50	26.50	26.00
Baltimore, del.	26.99	26.49	27.49	26.99
Steelton, Pa., base	25.00	24.50	25.50	25.00
Swedeland, Pa., base	26.00	25.50	26.50	26.00
Philadelphia, del.	26.84	26.34	27.34	26.84
Toledo, O., base	25.00	24.50	25.50	25.00
Youngstown, O., base	25.00	24.50	25.50	25.00
Mansfield, O., del.	26.94	26.44	27.44	26.94

Base grade, silicon 1.75-2.25%; add 50 cents for each additional 0.25% silicon, or portion thereof; deduct 50 cents for silicon below 1.75% on foundry iron. †For phosphorus 0.70% or over deduct 38 cents. ‡For McKees Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

Note: Add 50 cents per ton for each 0.50% manganese or portion thereof over 1.00%.

Nickel differentials: Under 0.50%, no extra; 0.50% to 0.74% incl., \$2 per ton; for each additional 0.25% nickel, \$1 per ton.

High Silicon, Silvery

6.00-6.50 per cent (base) . . . \$30.50
 6.51-7.00 . . . \$31.50 9.01- 9.50 . . . 36.50
 7.01-7.50 . . . 32.50 9.51-10.00 . . . 37.50
 7.51-8.00 . . . 33.50 10.01-10.50 . . . 38.50
 8.01-8.50 . . . 34.50 10.51-11.00 . . . 39.50
 8.51-9.00 . . . 35.50 11.01-11.50 . . . 40.50

F.o.b. Jackson county, O., per gross ton, Buffalo base prices are \$1.25 higher. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Electric Furnace Ferrosilicon: Sil. 14.01 to 14.50%, \$45.50; each additional .50% silicon up to and including 18% add \$1; low impurities not exceeding 0.05 Phos., 0.40 Sulphur, 1.00% Carbon, add \$1.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus \$1 per gross ton. (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Charcoal Pig Iron

Northern
 Lake Superior Furn. \$34.00
 Chicago, del. 37.34

Southern

Semi-cold blast, high phos., f.o.b. furnace, Lyles, Tenn. \$28.50
 Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn. 33.00

Gray Forge

Neville Island, Pa. \$24.50
 Valley base 24.50

Low Phosphorus

Basing points: Birdsboro, Pa., \$30.50; Steelton, Pa., and Buffalo, N. Y., 30.50 base; 31.74, del., Philadelphia. Intermediate phos., Central Furnace, Cleveland, \$27.50

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differential: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).

Phosphorus Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorus content of 0.70% and over.

Ceiling Prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges

from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Exceptions to Ceiling Prices: Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic Bessemer and Malleable. Mystic Iron Works, Everett, Mass., may exceed basing point prices by \$1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick
 Super Quality
 Pa., Mo., Ky. \$66.55

First Quality
 Pa., Ill., Md., Mo., Ky. 52.85
 Alabama, Georgia 52.85
 New Jersey 57.70
 Ohio 46.35

Second Quality
 Pa., Ill., Md., Mo., Ky. 47.90
 Alabama, Georgia 39.15
 New Jersey 50.50
 Ohio 37.10

Malleable Bung Brick
 All bases 61.65

Silica Brick
 Pennsylvania 52.65
 Joliet, E. Chicago 60.65
 Birmingham, Ala. 52.85

Ladle Brick
 (Pa., O., W. Va., Mo.)
 Dry press 31.95
 Wire cut 29.90

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

Metallurgical grade, f.o.b. Ill., Ky., net ton carlots CaF₂ content, 70% or more, \$33; 65 but less than 70%, \$32; 60 but less than 65% \$31; less than 60%, \$30. (After Aug. 29 base price any grade \$30.) war chemicals.

Ferroalloy Prices

Ferromanganese (standard) 78-82% c.i. gross ton, duty paid, eastern, central and western zones, \$135; add \$6 for packed c.i., \$10 for ton, \$13.50 less-ton; f.o.b. cars, Eastern seaboard and Gulf ports, \$17.00 for each 1%, or fraction contained manganese over 82% or under 78%; delivered Pittsburgh, \$140.33.

Ferromanganese (Low and Medium Carbon); per lb. contained manganese; eastern zone, low carbon, bulk, c.i., 23c; 2000 lb. to c.i., 23.40c; medium, 14.50c and 15.20c; central, low carbon, bulk, c.i., 23.30c; 2000 lb. to c.i., 24.40c; medium 14.80c and 16.20c; western, low carbon, bulk, c.i., 24.50c, 2000 lb. to c.i., 25.40c; medium, 15.75c and 17.20c; f.o.b. shipping point, freight allowed.

Spiegeleisen: 19-21% carlots per gross ton, Palmerton, Pa., \$36; 18-19%, \$35.

Electrolytic Manganese: 99.9% plus, less ton lots, per lb. 37.6 cents.

Chromium Metal: 97% min. chromium, max. .50% carbon, eastern zone, per lb. contained chromium bulk, c.i., 79.50c, 2000 lb. to c.i. 80c; central, 81c and 82.50c; western 82.25c and 84.75c; f.o.b. shipping point, freight allowed.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, R.R. freight allowed, eastern zone, \$2.25; less-ton lots \$2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: High carbon, eastern zone, bulk, c.i., 13c, 2000 lb. to c.i., 13.90c; central, add 40c and .65c; western, add 1c and 1.85c—high nitrogen, high carbon ferrochrome: Add 5c to all high carbon

ferrochrome prices; all zones; low carbon eastern, bulk, c.i., max. 0.06% carbon, 23c, 0.10% 22.50c, 0.15% 22c, 0.20% 21.50c, 0.50% 21c, 1.00% 20.50c, 2.00% 19.50c; 2000 lb. to c.i., 0.06% 24c, 0.18% 23.50c, 0.15% 23c, 0.20% 22.50c, 0.50% 22c, 1.00% 21.50c, 2.00% 20.50c; central, add .4c for bulk, c.i. and .65c for 2000 lb. to c.i.; western, add 1c for bulk, c.i. and 1.85c for 2000 lb. c.i.; carload packed differential 45c; f.o.b. shipping point, freight allowed. Prices per lb. contained Cr high nitrogen, low carbon ferrochrome: Add 2c to low carbon ferrochrome prices; all zones. For higher nitrogen carbon add 2c for each .25% of nitrogen over 0.75%.

Special Foundry ferrochrome: (Chrom. 62-66%, car. approx. 5-7%) Contract, carload, bulk 13.50c, packed 13.95c, ton lots 14.40c, less, 14.90c, eastern, freight allowed, per pound contained chromium; 13.90c, 14.35c, 15.05c and 15.55c central; 14.50c, 14.95c, 16.25c and 16.75c, western; spot up .25c.

S.M. Ferrochrome, high carbon: (Chrom. 60-65%, sil. 4-6%, mang. 4-6% and carbon 4-6%) Contract, carlot, bulk, 14.00c, packed 14.45c, ton lots 14.90c, less 15.40c, eastern, freight allowed; 14.40c, 14.85c, 15.55c and 16.05c, central; 15.00c, 15.45c, 16.75c and 17.25c, western; spot up .25c; per pound contained chromium.

S.M. Ferrochrome, low carbon: (Chrom. 62-66%, sil. 4-6%, mang. 4-6% and carbon 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots

22.00c, eastern, freight allowed, per pound contained chromium; 20.40c, 20.85c, 21.65c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up .25c.

SMZ Alloy: (Silicon 60-65%, Mang. 5-7%, zir. 5-7% and iron approx. 20%) per lb. of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up .25c.

Silicaz Alloy: (Sil. 35-40%, cal. 9-11%, alum. 6-8%, zir. 3-5%, tit. 9-11% and boron 0.55-0.75%), per lb. of alloy contract, carlots 23.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed; 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up .25c.

Silvaz Alloy: (Sil. 35-40%, van. 9-11%, alum. 5-7%, zir 5-7%, tit. 9-11% and boron 0.55-0.75%), per lb. of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern, freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up .4c.

CMSZ Alloy 4: (Chr. 45-49%, mang. 4-6%, sil. 18-21%, zir. 1.25-1.75%, and car. 3.00-4.50%) Contract, carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up .25c.

CMSZ Alloy 5: (Chr. 50-56%, mang. 4-6%, sil. 13.50-16.00%, zir. 75-1.25%, car. 3.50-5.00%) per lb. of alloy. Contract, carlots, bulk, 10.75c, packed 11.20c, ton lots 11.75c, less 12.25c, eastern, freight allowed;

11.25c, 11.75c and 12.50c, central; 13.25c and 13.75c, 14.50c and 15.00c, western, spot up .25c.

Ferro-Boron: (Bor. 17.50% min., sil. 1.50% max., alum. 0.50% max. and car. 0.50% max.) per lb. of alloy contract ton lots, \$1.20, less ton lots \$1.30, eastern, freight allowed; \$1.2075 and \$1.3075 central; \$1.229 and \$1.329, western; spot add 5c.

Manganese-Boron: (Mang. 75% approx., boron 15-20%, iron 5% max., sil. 1.50% max. and carbon 3% max.), per lb. of alloy. Contract, ton lots, \$1.89, less, \$2.01, eastern, freight allowed; \$1.903 and \$2.023 central, \$1.935 and \$2.055 western, spot up 5c.

Nickel-Boron: (Bor. 15-18%, alum. 1% max., sil. 1.50% max., car. 0.50% max., iron 3% max., nickel, balance), per lb. of alloy. Contract, 5 tons or more, \$1.90, 1 ton to 5 tons, \$2.00, less than ton \$2.10, eastern, freight allowed; \$1.9125, \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1445, western; spot same as contract.

Chromium-Copper: (Chrom. 8-11%, cu. 88-90%, iron 1% max., sil. 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot, up 2c.

Vanadium Oxide: (Fused: Vanadium oxide 85-88%, sodium oxide approx. 10% and calcium oxide approx. 2%, or Red Cake; Vanadium oxide 85% approx., sodium oxide, approx. 9% and water approx.

2.5%) Contract, any quantity, \$1.10 eastern, freight allowed, per pound vanadium oxide contained; contract carlots, \$1.105, less carlots, \$1.108, central; \$1.118 and \$1.133, western; spot add 5c to contracts in all cases. **Calcium metal**; east: Contract, ton lots or more \$1.80, less, \$2.30, eastern zone, freight allowed, per pound of metal; \$1.809 and \$2.309 Central, \$1.849 and \$2.349, western; spot up 5c. **Calcium-Manganese-Silicon**: (C a l. 16-20% mang. 14-18% and sil. 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up .25c. **Calcium-Silicon**: (Cal. 30-35%, sil. 60-65% and iron 3.00% max.), per lb. of alloy. Contract, carlot, lump 18.00c, ton lots 14.50c, less 15.00c, eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up .25c. **Briquets, Ferromanganese**: (Weight approx. 3 lbs. and containing exactly 2 lbs. mang.) per lb. of briquets. Contract, carlots, bulk .0605c, packed .063c, tons .0655c, less .068c, eastern, freight allowed; .063c, .0655c, .0755c and .078c, central; .066c, .0685c, .0855c and .088c, western; spot up .25c. **Briquets, Ferrochrome**, containing exactly 2 lb. cr., eastern zone, bulk, c.l., 8.25c per lb. of briquets, 2000 lb. to c.l., 8.75c; central, add .3c for c.l. and .5c for 2000 lb. to c.l.; western, add .70c for c.l. and .2c for 2000 lb. to c.l.; silicomanganese,

eastern, containing exactly 2 lb. manganese and approx. 1/4 lb. silicon, bulk, c.l., 5.80c, 2000 lbs. to c.l., 6.30c; central, add .25c for c.l. and 1c for 2000 lb. to c.l.; western, add .5c for c.l., and 2c for 2000 lb. to c.l.; ferrosilicon, eastern, approx. 5 lb., containing exactly 2 lb. silicon, or weighing approx. 2 1/2 lb. and containing exactly 1 lb. of silicon, bulk, c.l., 3.85c, 2000 lb. to c.l., 3.80c; central, add 1.50c for c.l., and .40c for 2000 lb. to c.l.; western, add 3.0c for c.l. and .45c for 2000 to c.l.; f.o.b. shipping point, freight allowed. **Ferromolybdenum**: 55-75% per lb. contained molybdenum f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c. **Ferrophosphorus**: 17-19%, based on 18% phosphorus content, with unitage of \$3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25. **Ferrosilicon**: Eastern zone, 90-95%, bulk, c.l., 11.05c, 2000 lb. to c.l., 12.30c; 80-90%, bulk c.l., 8.90c, 2000 lb. to c.l., 9.95c; 75%, bulk, c.l., 8.05c, 2000 lb. to c.l., 9.05c; 50%, bulk c.l., 6.65c and 2000 lb. to c.l., 7.85c; central 90-95%, bulk, c.l., 11.20c, 2000 lb. to c.l., 12.80c; 80-90%, bulk, c.l., 9.05c, 2000 to c.l., 10.45c; 75%, bulk, c.l., 8.20c, 2000 lb. to c.l., 9.65c; 50% bulk, c.l., 7.10c, 2000 lb. to c.l., 9.70c; western, 90-95%, bulk, c.l., 11.65c, 2000 lb. to c.l., 15.60c; 80-90%, bulk, c.l., 9.55c, 2000 lb. to c.l., 13.50c; 75%, bulk, c.l., 8.75c, 2000

to c.l., 13.10c; 50%, bulk, c.l., 7.25c, 2000 to c.l., 8.75c; f.o.b. shipping point, freight allowed. Prices per lb. contained silicon. **Silicon Metal**: Min. 97% silicon and max. 1% iron, eastern zone, bulk, c.l., 12.90c, 2000 lb. to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% silicon and max. 2% iron, eastern, bulk, c.l., 12.50c, 2000 lb. to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c f.o.b. shipping point, freight allowed. Price per lb. contained silicon. **Manganese Metal**: (96 to 98% manganese, max. 2% iron), per lb. of metal, eastern zone, bulk, c.l., 36c, 2000 lb. to c.l., 38c, central, 36.25c, and 39c; western 36.55c and 41.05c; 95 to 97% manganese, max. 2.50% iron, eastern, bulk, c.l., 34c, 2000 to c.l., 35c; central 34.25c and 36c; western, 34.55c and 38.05c; f.o.b. shipping point, freight allowed. **Ferrotungsten**: Spot, carlots, per lb. contained tungsten, \$1.90; freight allowed as far west as St. Louis. **Tungsten Metal Powder**: spot, not less than 97 per cent, \$2.50-\$2.60; freight allowed as far west as St. Louis. **Titanium**: 40-45%, R.R. freight allowed, per lb. contained titanium; ton lots \$1.23; less-ton lots \$1.25; eastern, Spot up 5 cents per lb. **Ferrotitanium**: 20-25%, 0.10 maximum carbon; per lb. contained titanium; ton lots \$1.35; less-ton lots \$1.40 eastern. Spot 5 cents per lb. higher. **High-Carbon Ferrotitanium**: 15-20% contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight air

allowed to destination east of Mississippi River and North of Baltimore and St. Louis, 6-8% carbon \$142.50; 3-5% carbon \$157.50. **Carbotam**: Boron 0.90 to 1.15% net ton to carload, 8c lb. f.o.b. Suspension Bridge, N. Y., frt. allowed same as high-carbon ferrotitanium. **Bortam**: Boron 1.5-1.9%, ton lots 45c lb., less ton lots 50c lb. **Ferrovannadium**: 35-55%, contract basis, per lb. contained vanadium, f.o.b. producers plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90. **Zirconium Alloys**: 12-15%, per lb. of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads bulk, per gross ton \$102.50; packed \$107.50; ton lots \$108; less-ton lots \$112.50. Spot 1/4c per ton higher. **Zirconium Alloy**: 35-40%, Eastern, contract basis, carloads in bulk or package, per lb. of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot 1/4 cent higher. **Alister**: (Approx. 20% aluminum, 40% silicon, 40% iron) contract basis f.o.b. Niagara Falls, N. Y., per lb. 5.75c; ton lots 6.50c. Spot 1/4 cent higher. **Simnani**: (Approx. 20% each Si, Mn., Al.) Contract, frt. all. not over St. Louis rate, per lb. alloy; carlots 8c; ton lots 8.75c; less ton lots 9.25c. **Borolit**: 3 to 4% boron, 40 to 45% Si., \$6.25 lb. cont. Bo., f.o.b. Philo., O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. For complete OPA ceiling price schedule refer to page 150 of Sept. 4, 1944, issue of STEEL. Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$18.25
No. 2 Heavy Melt. Steel	18.25
No. 2 Bundles	15.75-16.25
No. 3 Bundles	13.75-14.25
Mixed Borings, Turnings	9.50
Machine Shop Turnings	9.50
No. 2 Busheling	12.50
Billet, Forge Crops	20.75-21.25
Bar Crops, Plate Scrap	20.75-21.25
Cast Steel	20.75-21.25
Punchings	20.75-21.25
Elec. Furnace Bundles	18.75
Heavy Turnings	17.00

Cast Grades

(F.o.b. Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices.)

No. 1 Heavy Melt. Steel	\$14.33-15.33
No. 2 Heavy Melt. Steel	14.33-15.33
No. 2 Hyd. Bundles	12.83-15.33
No. 3 Hyd. Bundles	10.83
Chemical Borings	14.33
Machine Turning	6.50
Mixed Borings, Turnings	6.50
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstrip Motor Blocks	17.50
Stove Plate	19.00

CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	10.00-10.50
Short Shovel Turnings	14.00-14.50
Mixed Borings, Turnings	12.00-12.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.00-13.50
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

BOSTON:

(F.o.b. shipping points)

No. 1 Heavy Melt. Steel	\$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	13.06-14.06
No. 1 Busheling	13.06-14.06
Machine Shop Turnings	5.50
Mixed Borings, Turnings	5.50
Short Shovel, Turnings	7.50
Chemical Borings	13.06
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

PITTSBURGH:

(Delivered consumer's plant)

Railroad Heavy Melting	\$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel, Turnings	16.00
Mach. Shop Turnings	14.00
Mixed Borings, Turnings	14.00
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	21.00

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Hvy. Melt.	\$21.00
No. 1 Heavy Melt Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	15.00-15.50
Cast Iron Borings	14.00-14.50
Machine Shop Turnings	11.50-12.50
Low Phos. Plate	21.00-22.00

MANSFIELD, O.:

(Delivered consumer's plant)

Machine Shop Turnings	11.00-11.50
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BIRMINGHAM:

(Delivered consumer's plant)

Billet, Forge Crops	\$22.00
Structural, Plate Scrap	19.00
Scrap Rails, Random	18.50
Revolving Rails	20.50
Angle Splice Bars	20.50

Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	8.50-9.00
Cast Iron Borings	8.50-9.00
Iron Car Wheels	16.50-17.00

CHICAGO:

(Delivered consumer's plant)

No. 1 R.R. Hvy. Melt.	\$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dir. Bundles	18.75
Baled Mach. Shop Turn.	16.25-18.50
No. 3 Galv. Bundles	14.25-14.75
Machine Turnings	10.50-12.00
Mix. Borings, Sht. Turn.	12.00-12.50
Short Shovel Turnings	12.00-12.50
Cast Iron Borings	20.25
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

(Cast grades f.o.b. shipping point, railroad grades f.o.b. tracks)

BUFFALO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	12.00
Short Shovel Turnings	14.00
Mixed Borings, Turn.	12.00
Cast Iron Borings	13.00
Low Phos.	21.75

DETROIT:

(Dealers' buying prices)

Heavy Melting Steel	\$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	7.00-7.50
Short Shovel, Turnings	10.50-11.00
Cast Iron Borings	9.50-10.00
Low Phos Plate	19.32-19.82
No. 1 Cast	20.00
Heavy Breakable Cast	13.50-14.00

ST. LOUIS:

(Delivered consumer's plant)

Heavy Melting	\$17.50
No. 1 Locomotive Tires	20.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00

Machine Turnings	6.50-7.00
Revolving Rails	21.00
Steel Car Axles	21.50-22.00
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Machinery Cast	20.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Gate Bars	15.25
Brake Shoes	15.25
(Cast grades f.o.b. shipping point)	
Stove Plate	18.00

CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$18.50
No. 2 Heavy Melt. Steel	18.50
No. 1 Comp. Bundles	18.50
No. 2 Comp. Bundles	18.50
Machine Turnings	7.50-8.00
Shoveling Turnings	9.50-10.00
Cast Iron Borings	9.50-10.00
Mixed Borings, Turnings	8.50-9.00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-21.50
Scrap Rails	20.50-21.00
Stove Plate	16.00-16.50

LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Deal. Bundles	12.00
Machine Turnings	4.50
Mixed Borings, Turnings	4.00
No. 1 Cast	20.00

SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	\$15.50
No. 2 Heavy Melt. Steel	14.50
No. 1 Busheling	15.50
No. 1, No. 2 Bundles	13.50
No. 3 Bundles	9.00
Machine Turnings	6.90
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	15.50
Cut Structural, Plate, 1", under	18.00
Alloy-free Turnings	7.50
Tin Can Bundles	14.50
No. 2 Steel Wheels	16.00
Iron, Steel Axles	15.00
No. 2 Cast Steel	16.00
Uncut Frogs, Switches	16.00
Scrap Rails	16.00
Locomotive Tires	16.00

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 12.00c, Del. Conn., less carlots 12.12½c, refinery; dealers may add ¼c for 5000 lbs. to carload; 1000-4999 lbs. 1c; 500-999 1½c; 0-499 2c. Casting, 11.75c, refinery for 20,000 lbs., or more, 12.00c less than 20,000 lbs.

Brass Ingot: Carlot prices, including 25 cents per hundred freight allowance; add ¼c for less than 20 tons; 85-5-5-5 (No. 115) 13.00c; 83-10-2 (No. 215) 16.50c; 80-10-10 (No. 305) 15.75c; Navy G (No. 225) 16.75c; Navy M (No. 245) 14.75c; No. 1 yellow (No. 405) 10.00c; manganese bronze (No. 420) 12.75c.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis, for carlots. For 20,000 lbs. to carlots add 0.15c; 10,000-20,000 0.25c; 2000-10,000 0.40c; under 2000 0.50c.

Lead: Common 6.35c, chemical, 6.40c, corroding, 6.45c, E. St. Louis for carloads; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Worcester-Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lbs. and over; add ¼c 2000-9999 lbs.; 1c less through 2000 lbs.

Secondary Aluminum: All grades 12.50c per lb. except as follows: Low-grade piston alloy (No. 122 type) 10.50c; No. 12 foundry alloy (No. 2 grade) 10.50c; chemical warfare service ingot (92¼% plus) 10.00c; steel deoxidizers in notch bars, granulated or shot, Grade 1 (95-97½%) 11.00c, Grade 2 (92-95%) 9.50c to 9.75c, Grade 3 (90-92½%) 8.50c to 8.75c, Grade 4 (85-90%) 7.50c to 8.00c; any other ingot containing over 1% iron, except PM 754 and hardness, 12.00c. Above prices for 30,000 lb. or more; add ¼c 10,000-30,000 lb.; ½c 1000-10,000 lbs.; 1c less than 1000 lbs. Prices include freight at carload rate up to 75 cents per hundred.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lbs.), 20.50c lb., add 1c for special shapes and sizes. Alloy ingots, incendiary bomb alloy, 23.40c; 50-50 magnesium-aluminum, 23.75c; ASTM B93-41T, Nos. 2, 3, 4, 12, 13, 14, 17, 23.00c; Nos. 4X, 11, 13X, 17X, 25.00c; ASTM B-107-41T, or B-90-41T, No. 8X, 23.00c; No. 18, 23.50c; No. 18X, 25.00c. Selected magnesium crystals, crowns, and muffs, including all packing, screening, barrelling, handling, and other preparation charges, 23.50c. Prices for 100 lbs. or more; for 25-100 lbs., add 10c; for less than 25 lbs., 20c. Incendiary bomb alloy, f.o.b. plant, any quantity; carload freight allowed all other alloys for 500 lbs. or more.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lbs., 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straita), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05 per cent maximum arsenic, 51.87½c; Grade C, 99.65-99.79% incl. arsenic, 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American, bulk carlots f.o.b. Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05%, max. and other impurities, 0.1%, max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb.; ½c for 9999-224-lb.; and 2c for 223 lb. and less; on sales by dealers, distributors and jobbers add ¼c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, f.o.b. refinery 35.00c lb.; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c; Monel shot 28.00c.

Mercury: OPA ceiling prices per 76-lb. flask f.o.b. point of shipment or entry. Domestic produced in Calif., Oreg., Wash., Idaho, Nev., Ariz., \$191; produced in Texas, Ark. \$193. Foreign, produced in Mexico, duty paid, \$193. Open market, spot, New York, nominal for 50 to 100 flasks; \$158 to \$163 in smaller quantities.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be., \$17 lb. contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks and all other "regular" straight or flat forms 90.00c lb., del.; anodes,

balls, discs and all other special or patented shapes 95.00c lb. del.

Cobalt: 97-99%, \$1.50 lb. for 550 lb. (bbl.); \$1.52 lb. for 100 lb. (case); \$1.57 lb. under 100 lb.

Iridium: 99.9%, \$7.50 per troy ounce.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, N. Y. 44.75c per ounce.

Platinum: \$33 per ounce.

Iridium: \$165 per troy ounce.

Palladium: \$24 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 12.00c, Conn., for copper. Freight prepaid on 100 lbs. or more.)

Sheet: Copper 20.87c; yellow brass 19.48c; commercial bronze, 90% 21.07c, 95% 21.28c; red brass, 80% 20.15c, 85% 20.36c; phosphor bronze, Grades A and B 5% 36.25c; Everdur, Herculey, Duronze or equiv. 26.00c; naval brass 24.50c; manganese bronze 28.00c; Muntz metal 22.75c; nickel silver 5% 26.50c.

Rods: Copper, hot-rolled 17.37c, cold-rolled 18.37c; yellow brass 15.01c; commercial bronze 90% 21.32c, 95% 21.53c; red brass 80% 20.40c, 85% 20.61c; phosphor bronze Grade A, B 5% 36.50c; Everdur, Herculey, Duronze or equiv. 26.50c; Naval brass 19.12c; manganese bronze 22.50c; Muntz metal 18.87c; nicked silver 5% 26.50c.

Seamless Tubing: Copper 21.37c; yellow brass 22.23c; commercial bronze 90% 23.47c; red brass 80% 22.80c, 85% 23.01c.

Extruded Shapes: Copper 20.87c; architectural bronze 19.12c; manganese bronze 24.00c; Muntz metal 20.12c; Naval brass 20.87c.

Angles and Channels: Yellow brass 27.98c; commercial bronze 90% 29.57c, 95% 29.78c; red brass 80% 28.65c, 85% 28.86c.

Copper Wire: Soft, f.o.b. Eastern mills, carlots 15.37½c, less-carlots 15.87½c; weather-proof, f.o.b. Eastern mills, carlot 17.00c, less-carlots 17.50c; magnet, delivered, carlots 17.50c, 15,000 lbs. or more 17.75c, less carlots 18.25c.

Aluminum Sheets and Circles: 2s and 3s, flat mill finish, base 30,000 lbs. or more; del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	26.20c
8-10	12"-48"	23.20c	26.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	36.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 9.50c; cut sheets 9.75c; pipe 8.15c, New York; 8.25c, Philadelphia, Baltimore, Rochester and Buffalo; 8.75c, Chicago, Cleveland, Worcester, Boston.

Zinc Products: Sheet f.o.b. mill, 13.15c; 36,000 lbs. and over deduct 7%. Ribbon and strip 12.25c, 3000-lb. lots deduct 1%, 6000 lbs. 2% 9000 lbs. 3%, 13,000 lbs. 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lbs. 12.50c; 100-500 lbs. 13.00c; under 100 lbs. 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

Plating Materials

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lbs. to 1 ton 17.75c; under 400 lbs. 18.25c. Copper Anodes: Base 2000-5000 lbs., del.; oval 17.62c; untrimmed 18.12c; electro-deposited 17.37c.

Copper Carbonate: 52-54% metallic cu, 250 lb. barrels 20.50c.

Copper Cyanide: 70-71% cu, 100-lb. kegs or bbls. 34.00c f.o.b. Niagara Falls.

Sodium Cyanide: 96%, 200-lb. drums 15.00c; 10,000-lb. lots 13.00c f.o.b. Niagara Falls.

Nickel Anodes: 500-2899 lb. lots; cast and rolled carbonized 47.00c; rolled, depolarized 48.00c.

Nickel Chloride: 100-lb. kegs or 275-lb. bbls. 18.00c lb., del.

Tin Anodes: 1000 lbs. and over 53.50c, del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb. bbls. 39.00c f.o.b. Grasselli, N. J.; 100-lb. kegs 39.50c.

Sodium Stannate: 100 or 300-lb. drums 36.50c, del.; ton lots 33.50c.

Zinc Cyanide: 100-lb. kegs or bbls. 33.00c f.o.b. Niagara Falls.

Brass Mill Allowances: Prices for less than 15,000 lbs. f.o.b. shipping point. Add ¼c for 15,000-40,000 lbs.; 1c for 40,000 lbs. or more.

Scrap Metals

	Clean Heavy	Rod Ends	Clean Turnings
Copper	10.250	10.250	9.500
Tinned Copper	9.625	9.625	9.375
Yellow Brass	8.625	8.375	7.875
Commercial bronze			
90%	9.375	9.125	8.625
95%	9.600	9.250	8.750
Red Brass, 85%	9.125	8.875	8.375
Red Brass, 80%	9.125	8.875	8.375
Muntz metal	8.000	7.780	7.250
Nickel Sil., 5%	9.250	9.000	8.625
Phos. br., A, B, 5%	11.000	10.750	9.750
Herculey, Everdur or equivalent	10.250	10.000	9.250
Naval brass	8.250	8.000	7.500
Mang. bronze	8.250	8.000	7.500

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are f.o.b. shipping point; add ¼c for shipment of 60,000 lbs. of one group and ½c for 20,000 lbs. of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper, copper borings 9.75c; No. 3 copper wire and mixed heavy copper, copper tuyeres 8.75c.

(Group 2) soft red brass and borings, aluminum bronze 9.00c; copper-nickel and borings 9.25c; car boxes, cocks and faucets 7.75c; ball metal 15.50c; babbit-lined brass bushings 13.00c.

(Group 3) zincy bronze borings, Admiralty condenser tubes, brass pipe 7.50c; Muntz metal condenser tubes 7.00c; yellow brass 6.25c; manganese bronze (lead 0.00%-0.40%) 7.25c, (lead 0.41%-1.0%) 6.25c; manganese bronze borings (lead 0.00-0.40%) 6.50c, (lead 0.41-1.00%) 5.50c.

Aluminum Scrap: Prices f.o.b. point of shipment, respectively for lots of less than 1000 lbs.; 1000-20,000 lbs. and 20,000 lbs. or more, plant scrap only. Segregated solids: S-type alloys (2S, 3S, 17S, 18S, 24S, 32S, 52S) 9.00c, 10.00c, 10.50c; All other high grade alloys 8.50c, 9.50c, 10.00c; low grade alloys 8.00c, 9.00c, 9.50c. Segregated borings and turnings: Wrought alloys (17S, 18S, 32S, 52S) 7.50c, 8.50c, 9.00c; all other high grade alloys 7.00c, 8.00c, 8.50c; low grade alloys 6.50c, 7.50c, 8.00c. Mixed plant scrap, all solids, 7.50c, 8.50c, 9.00c; borings and turnings 5.50c, 6.50c, 7.00c.

Lead Scrap: Prices f.o.b. point of shipment. For soft and hard lead, including cable lead, deduct 0.55c from basing point prices for refined metal.

Zinc Scrap: New clippings 7.25c, old zinc 5.25c f.o.b. point of shipment; add ¼-cent for 10,000 lbs. or more. New die-cast scrap, radiator grilles 4.95c, add ½c 20,000 or more. Unsweated zinc dross, die cast slab 5.80c any quantity.

Nickel, Monel Scrap: Prices f.o.b. point of shipment; add ¼c for 2000 lbs. or more of nickel or cupro-nickel shipped at one time and 20,000 lbs. or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ¼% copper 26.00c; 90-98% nickel, 26.00c per lb. nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb. contained nickel, plus 8.00c per lb. contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c.

Sheet demand shows no slackening and deliveries are being deferred further. Most interest is in prompt material and as little space is available buying is limited. Civilian demand is increasing but little assurance of firm delivery dates is possible. Hot-rolled pickled and cold-rolled deliveries in most cases are about the end of the year or early 1946. Validated orders carry well through third quarter but automotive and other consumers are seeking July 1 promises.

Boston — Heavier unrated orders on which deliveries are uncertain are in excess of cancelled and cutback ton-

nage affecting nearby schedules. Backlogs of CMP tonnage for forward delivery are too large to enable most mills to make firm commitments on unrated volume for third quarter and limits fourth quarter openings on the basis of current cancellations. Extensions in deliveries have been halted in numerous cases and in spots have improved by a month or more. Scattered hot-rolled electro-galvanized and galvanized are in this category, also stainless promised in spots for July and August. Cutbacks involve cancellations in cold-rolled sheets and strip for powder containers. In connection with placing of unrated orders pressure from the automobile industry for definite promises as to production space and delivery is outstanding, but cancel-

lations of firm orders now in backlogs will have to be heavier before substantial openings will occur. More delayed cancellations are expected to develop this month. However, new volume of rated tonnage is lower.

Philadelphia — Most interest in sheets is for nearby shipment and as there is little capacity available, buying therefore is somewhat limited. However, as automotive requirements take shape a livelier interest in future positions is expected. Meanwhile, hot-rolled pickled and cold-rolled sheet deliveries are holding generally around late December to February of 1946. One leading producer jumped his deliveries on cold-reduced sheets from November to February within the past week. This is believed to have been due primarily to a shift of tonnage to tin mills. Galvanized still can be had in November, although some sellers are booked well into first half, as also are some producers of hot narrow strip. Stainless steel sheet delivery falls mainly in September but may experience another easing soon as a result of the further recent cutback in Army aircraft production.

Pittsburgh — Civilian demand continues to rise. An avalanche of tonnage has poured onto producers, who are caught between government releases of civilian goods restrictions and full order books. Nowhere in the steel picture is the situation so bad as in sheets. Most producers are loaded with validated orders carrying through third quarter and beyond, while all sheet buyers from automobile builders on down are clamoring for July 1 tonnage. The answer is not yet in sight. Much sheet tonnage has been booked in the hope that there may be cancellations. Some of this tonnage carries definite promises, other lots only accepted for delivery when possible.

St. Louis — Sheet production in this area received its first cutback in products in actual manufacture when about 400 tons for bomb components were canceled. It represented approximately 4 per cent of a month's production and four civilian customers placed bids for it within 24 hours. Some backlogged orders continue to be canceled, but are replaced by others. The labor shortage continues and two furnaces are shut down as a result. Hot-rolled sheet deliveries are extended to December, cold-rolled to January and galvanized to August. All production remains on CMP but directives mainly involve galvanized sheets.

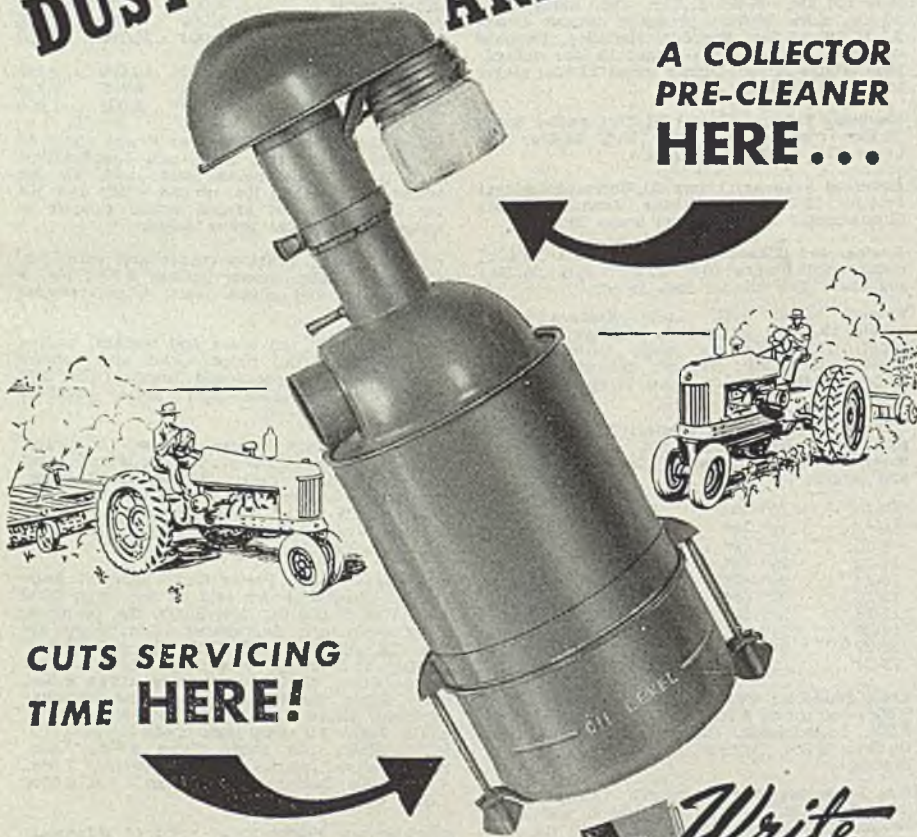
New York — Sheet buying is spotty with backlogs shrinking slightly. Most mills are quoting hot and cold-rolled sheets for delivery late this year and early in 1946. Silicon sheet deliveries range from November through March, next year, depending mainly on silicon content. A little stainless steel is being offered for August, with most mills quoting September.

Cleveland — Cancellations are increasing but additional orders come close to balancing losses. Schedules are tight and little third quarter business can be taken. On most sheet grades deliveries are well toward the end of the year and even into next.

Chicago — Demand for sheets continues to exceed supply and urgent military needs can be inserted in schedules only by directives. Sheetmakers' books are filled through third quarter by CMP orders. Virtually all mills have received numerous inquiries for sheets

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for the Navy's 25 per cent increase in the 1945 pontoon program, but are unable to meet required deliveries in what otherwise would be desirable tonnage. In its pontoon program, the Navy now is permitting contractors to find their own steel if and where they can. With exception of the automobile industry, no rush is occurring on the part of consumers to place unvalidated business for third quarter and later.

Cincinnati — Sheet cancellations are numerous, but fail to affect the overall tight mill situation. Deliveries are behind schedule, due to previous overloads. Any gaps in schedules are quickly filled, and new orders for military needs continue. Inquiries from manufacturers of consumer goods, and the if-and-when orders are piling up, as mills await a clarification of reconversion policies.

Steel Bars . . .

Bar Prices, Page 186

Little reflection of cutbacks has appeared in steel bars, though more extensive cancellations are expected. One factor is reduction of the Army aircraft program. Considerable civilian demand is awaiting booking, dependent to a great degree on the extent of reduction in the shell program. Plain carbon bar deliveries are in fourth quarter and hot-top quality in first quarter in most instances.

Philadelphia — Deliveries in plain carbon bars fall in fourth quarter and hot-top quality bars in first quarter, with larger sizes well into that period and in some instances beyond. Alloy and other special bars may be affected by the cutback in Army aircraft, although motor requirements in other directions should take up much of the slack. At present alloy bars are being quoted for late October and November in electric furnace grades and December in open-hearth analyses. Cold-drawn bar shipments also fall late in the year and even beyond on larger sizes, reflecting particularly requirements of the rocket program.

Boston — Revisions are under way which will affect forward orders placed with mills by converters and cold finishers of bars, strip and other products. Starting in July orders for hot-rolled stock will be on a sales replacement basis, April volume being the gage for that month. In many instances forward orders from cold finishers are in with mills well into next year and those with or without directives are affected. A large part of this volume is expected to be canceled. Cutbacks thus far affect bars more than other products, including small arms and artillery components, heavy chain and in one case a forge shop. Forge shops in any way connected with the truck program are not affected, although prospective tonnage for aircraft tends lower. Half a dozen shops in Connecticut are hit by artillery component revisions. Some mills now quote open-hearth and electric furnace alloy bars and billets for July delivery, compared with November and August, respectively, a month ago. Cold-finished alloy deliveries for November are unchanged. Improved deliveries are also promised by some cold-drawn mills, including rounds to 1 7/16-inch, and hexagons and squares to two inches in November from former January promise.

Pittsburgh — Although a substantial cancellation of bar tonnage is in prospect as the shell program recedes, particu-

larly in heavier items, up to the present there has been no reflection on mill books. A heavy volume of civilian demand could be placed if final word on the shell programs were available. Published reports of contract cancellations have not been followed by letters of cancellation, and the steel producer is left holding the bag, which is at this point quite a full one. Much of this tonnage will, of course, be canceled before July 1. Right now, however, anxious customers are bombarding their suppliers with requests for delivery dates in order to set up their own production lines.

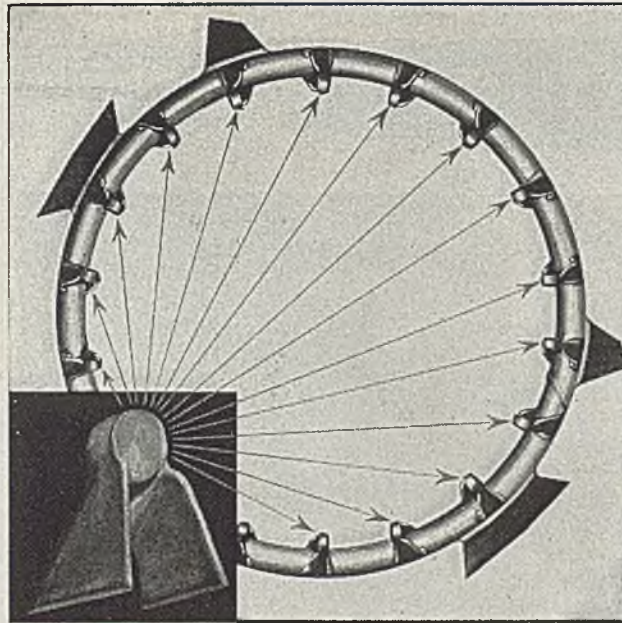
Chicago — Despite cutbacks in the shell program, pressure for bars, both carbon and alloy, continues great. Reason is that cutbacks bear more heavily

on future schedules than current production. Within another 30 to 60 days some easing may be observed, but considerable order tonnage is in hand ready to be inserted in schedules when this is possible. Agricultural implement manufacturers are ready to utilize considerable amounts of bars, and from all indications will continue on CMP during third quarter.

Steel Plates . . .

Plate Prices, Page 187

Increased buying of plates is offsetting to some degree the loss in tonnage for shipbuilding and with unrated orders coming to mills deliveries are being pushed further ahead. Numerous outlets for plates are appearing, notably for



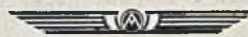
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lend-lease and for river craft. Considerable export business is looked for to give additional tonnage within a short time, if shipping space is available.

Philadelphia — While some universal plate tonnage still is available for June and one large producer has sheared plate for July most sheared plate mills are now quoting August, due in part to an increase in unrated steel orders. In addition to lend-lease tonnage for France plate producers expect substantial tonnage for the Scandinavian countries and Holland in third quarter, provided shipping space is available. Recent OPA price revision included a \$3 per ton advance in carbon steel floor plates, with the market now at 3.50c, Pittsburgh and Chicago. As no interim increase was granted on floor plates the present

advance is the same as on carbon plates.

Pittsburgh — Some buying from warehouses and shipyards is coupled with increasing volume of new construction in helping to hold plate tonnage at fairly high levels. Tonnage is available for virtually immediate delivery, however, in almost any size required. New river transport programs are now shaping up which will require a substantial number of barges over the balance of this year and also a fair tonnage of plates for towboats, dredges and similar river craft which have not been manufactured during wartime. Increase in the ODT transportation program which permits construction of a larger number of freight and passenger cars during last half will probably be translated into plate demand during June although specifications

against the increased program have not yet been received.

Boston — Buying is slow, with deliveries back to normal lead time on most widths. Cancellations include narrow plates required for sheave blocks in Maine, a direct reflection of lower shipbuilding activity, and an aircraft windshield subcontract. Most orders are in for current shipbuilding.

St. Louis — Production of plates continues to decline with demand, and an increasing portion of capacity is being shifted to sheets. Deliveries have advanced to September and later. The labor situation is bringing continued difficulty in finishing and shipment of some tonnage is being held up. Output principally is for Maritime Commission ship repairs.

Chicago — Plate situation here is such that mills can take business for September and later. This district now is producing little plate tonnage for West Coast, virtually all of this having been removed by WBP and distributed elsewhere. In the meantime, this loss of tonnage has been offset by increases in the bomb program, the material to be shipped to bomb makers in the mid-western area. Platemakers can furnish floor plates in connection with the Navy's 1945 pontoon program increase of 25 per cent, but whether the program can make headway is dependent upon whether sheets can be obtained.

Wire . . .

Wire Prices, Page 187

Boston—New volume of unrated inquiry is well in excess of cancellations, which are minor at mill level thus far, although more are expected in June. Openings in nearby schedules are not yet developing. Most drawn wire deliveries are in fourth quarter, which is also the earliest in rods. Orders for screw stock and bolt sizes are in with mills to the extent of allotments, which in some cases carry into fourth quarter. More consumers in this category are buying a heavier ratio of drawn carbon wire, rather than finishing their own from rods. Volume of open-hearth carbon is also relatively higher than bessemer, despite large quantities of screws and other small fasteners appearing in surplus lists for sale. Demand for new fabricated material is holding well. Approximately 400 tons of wire will be required for recent purchases of steel wool by the services.

Cleveland—Tightest situation in wire products appears to be in nails, which are tightest in a long time. Lend-lease is taking large tonnages for reconstruction in Europe and the Army has heavy demands for building in the Pacific areas. Experiments have been made in a new type of fiber container instead of wooden kegs, which have been breaking, with resulting loss of many nails. The fiber containers have withstood rigorous tests and are being used to a great degree.

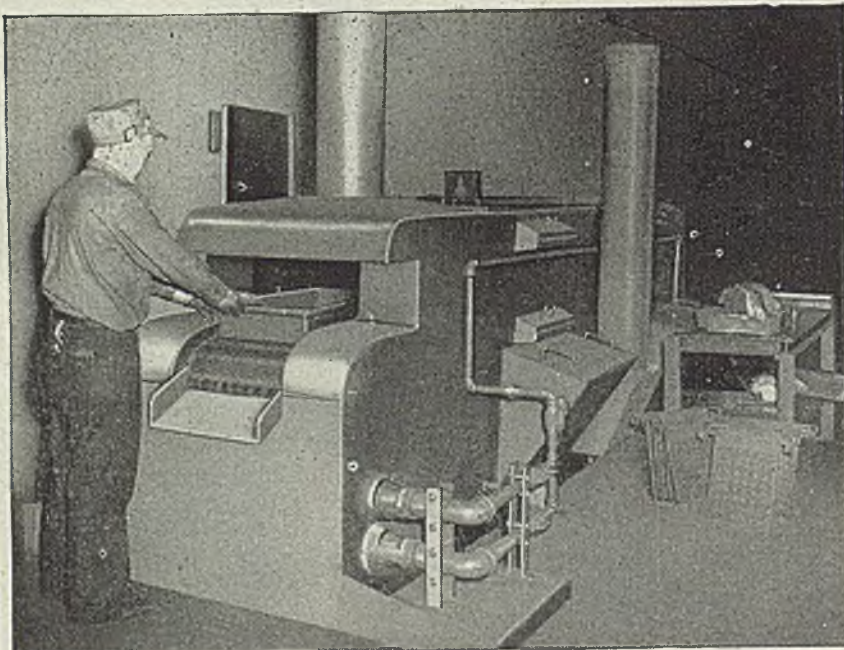
Tin Plate . . .

Tin Plate Prices, Page 187

Chicago — Tin plate output in this district will be increased slightly in third quarter, several makers having been given higher production directives for the period. The increase is less than WPB had sought, but manpower deficiency prevents raising schedules higher. First openings currently are in October.

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Rails, Cars . . .

Track Material Prices, Page 187

New York — Bids will be taken June 8 on 30,000 twenty-ton composite freight cars for France. The equipment includes 20,000 box cars and 10,000 gondolas, with bids handled by the War Department for the Foreign Economic Administration. Bids will also be opened June 11 by the War Department for FEA on 4000 box cars and 2000 gondolas for India. Both the French and Indian equipment is for delivery during the first three quarters of 1946. Also reported pending are 6750 box cars, 1500 forty-ton gondolas, all of composition material, for France, which also will be handled by the War Department for FEA.

Domestic demand includes 100 seventy-ton hopper cars for the Detroit, Toledo & Ironton. The Atlantic Coast Line is reported to be negotiating for 300 fifty-ton gondolas with the Brunswick Marine Construction Corp., Brunswick, Ga.

Structural Shapes . . .

Structural Shape Prices, Page 187

New York — Inquiry for structural shapes linked with automobile industry reconversion is heavy, including 18,000 tons for buildings for Buick at Flint, Mich., and Wilmington, Del. For warehouse structures greatly needed for surplus and excess storage 50,000 tons of all-metal buildings have been placed.

Boston — With a 500-ton bridge at Springfield, Mass., closing June 5, inquiry for bridge work is slightly heavier. With few exceptions, however, structural fabricating shops are seeking tonnage. The exceptions are those building outboard frames and subcontracting on portable aircraft hangars. At least two shipyards in this area during the war have equipped fabricating shops, notably in welding and report is that one, at least, will engage in general structural fabricating after the war. This is given impetus by the fact that one shipyard in Connecticut took out plans for a 300-ton deck plate girder span at Conway, N. H., which closed last week. Sheets are slightly easier for the most part, reflecting openings in shell steel, although August is the best month on scattered sizes, with others in September.

Pittsburgh — According to the estimate of American Institute of Steel Construction, more new construction work has been out for bids and awarded recently than at any time in the past three years. The volume is still relatively small, however, and will probably continue a slow upward climb as reconversion progresses. Reportedly a large number of new factories are to be built as soon as the civilian goods program begins to roll, and already there have been a number of these jobs open for bids, particularly in the automotive industry. Several large housing projects are pending, and plans for literally dozens of highway bridges are ready to go and will probably reach bidding stage in third quarter.

Chicago — Recent cancellations of Bailey bridges by the Army is affecting some fabricators severely, and they may soon be looking for tonnage for construction. Likewise, volume of work in building ship components is running out. Structural are in easy position today, delivery in August being possible.

In spite of this, new prospects for building construction are coming out slowly.

Philadelphia — Shape deliveries have stiffened, with all leading producers now quoting September on both standard and wide-flange sections. About a week ago one producer was offering July shipment on wide-flange. John McShane, Philadelphia, has been awarded the general contract on work at the Navy air supply depot in Philadelphia, requiring 1050 tons of shapes.

New York — Structural inquiry is featured by 2000 tons for five buildings for the Navy supply depot at Scotia, N. Y. Other inquiry includes a few hundred tons pending for a kettle house for the Colgate-Palmolive-Peet Co. at Jersey City, N. J. George A. Fuller Co., Washington, is taking bids on 2500 tons of

structurals for an ore reducing plant in West Virginia.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 187

New York — Bids are being taken for the third time on approximately 500 tons of reinforcing bars for a project by the New Jersey Housing Authority, on which the Rubin Construction Corp., 11 West Forty-second street, New York, is general contractor.

Pig Iron . . .

Pig Iron Prices, Page 189

While no distress has occurred in pig iron supply there are tight spots and in some areas consumers are operating on

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a day to day basis. Releases on civilian goods have brought a flood of castings orders, which foundries are unable to accept under present labor conditions. Third quarter buying lags but is expected to equal present demands.

Philadelphia — Except for a substantial order for basic iron little third quarter buying of pig iron has yet appeared. However, there is livelier general interest with prospects for fairly sustained consumption in that period, allowing for such seasonal influences as vacations and hot weather slowing.

Pittsburgh — Situation continues critical at many points, with merchant iron short and foundry demand heavy. The release of controls on civilian goods manufacture has resulted in an influx of inquiry to foundries in this district with many buyers offering firm orders with guaranteed tonnage for one to two years ahead. Iron supply at the moment is so precarious that most melters are operating on a day to day basis. Basic iron demand holds firm to increasing. Manpower shortage continues to restrict blast furnace operations, but there is a possibility that output will be boosted by the addition of at least one stack soon.

Boston — Shrinkage in subcontracts by several larger consumers of pig iron as labor supply improves for reconversion is indicated. With prospective decline in war contracts melt in these foundries will be heavier, notably in the textile mill equipment, paper mill and shoe machinery fields. Until 30-day limitation on inventories is lifted, buying continues meshed to that regulation; substantial number of smaller shops continue to buy on a monthly basis, in effect main-

taining policy established during allocations. Consumers of basic in most instances would stock iron more heavily, insurance against shortage which prevailed during the winter. All basic and most foundry grades continue to move in from outside furnaces with the district producer out of blast and reserves declining steadily.

The district cast iron pipe foundry has bought pig iron for the first time in months, taking first from the Everett furnace for resumption of operations on a limited basis. Reserve stocks at Everett furnace, however, are becoming out of balance and depleted. Additional malleable and foundry grades will come from outside sources shortly. Although furnace inventory is down to a low level resumption of pig iron production is uncertain as regards ore and prospective fuel requirements in New England.

Cincinnati — Books are now being opened for third quarter pig iron with every indication, judging by recent informal inquiries, that demand for tonnage will be equal, at least, to that in either the first or second quarters. Some furnaces are lagging with shipments, creating anxieties because stocks almost generally are slim. Middle interests report there is no surplus tonnage. By-product, foundry coke is in easier supply, and tapering in specifications is noted.

Buffalo — In spite of rumored cancellations in many lines early negotiations for third quarter pig iron bookings indicate little, if any, appreciable change from current quarter buying. Except for odd lots demand continues to absorb production. Sellers report foundries do not fear the possibility of being caught

with stocks. The opinion prevails that foundry reconversion involves no major problems. Makers of railroad castings are among the busiest operators at present. Strong demand for basic also continues.

Scrap . . .

Scrap Prices, Page 190

In general trading in scrap is dull, with numerous consumers out of the market, awaiting developments. Prices on steelmaking grades show no change, ceiling prices prevailing in all areas except eastern Pennsylvania, where softness appeared a fortnight ago. Weakness continues in turnings but cast scrap is scarce and strong. Shipments of steel-making grades from the West Coast to the Midwest have been discontinued because of heavier demand at home, with lighter production as shipbuilding declines.

Pittsburgh — No change is reportable in the Pittsburgh market. Sales of No. 1 heavy melting steel at ceiling price plus springboard have been reported in the past week, and demand remains high. There is continuing weakness in less desirable grades of turnings. Cast scrap is critically short. Heavy low phos has commanded ceiling prices although volume involved in recent sales is small.

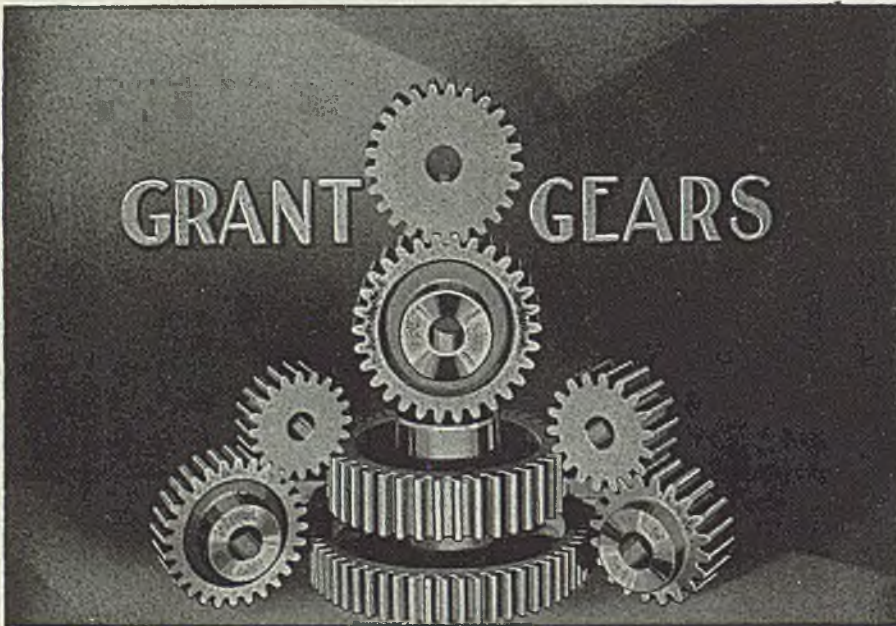
Philadelphia — While there is conflict of opinion on the future outlook in scrap overall sentiment is fairly strong and prices for the first time in a month show no change. The leading eastern Pennsylvania consumer of steel scrap is still practically out of the market while certain others are pressing harder for tonnage than for some time.

Boston — Slight, if any easing, is apparent in the tight supply of cast scrap with prices at ceiling. Heaviest inventories are held by the several textile mill equipment shops and some look large in view of meager reserves held by most gray iron foundries. However, intake of cast scrap by textile machinery builders has and is below normal, although likely to increase as these shops increase textile mill replacements. Most old machines usually come in as scrap when replaced by a new unit. Outright replacements have been limited for a long period, during which, most normal volume has been on repair and replacement parts, automatically reducing scrap available. As regards tire cord output new machinery has been mostly for expansion and old equipment kept in operation, thus releasing little scrap.

With completion of old contracts early this month scrap prices will undergo further test, with the trend uncertain and easy on lighter industrial grades, notably turnings. Unprepared steel scrap is also softening at \$8 to \$8.50.

St. Louis — Steel mills here are out of the remote scrap market and take local material only. Consumers are expected to withhold orders for several weeks, until a more definite government cutback plan is apparent. Scrap shipments are off sharply, with no takers for a glut of machine shop turnings.

Los Angeles — WPB allocations of shipyard scrap are being directed wholly to local mills, shipments eastward having been discontinued because of increased demand here. Mill reserves are still well ahead of the 45-day minimum supply. While No. 1 industrial scrap from shipyards is at ceilings, sales by dealers are below maximum. Dealers



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claim that prices are edging toward ceiling as buyers realize that with the decline of shipbuilding scrap from that source will continue to shrink.

Cleveland — While no change has appeared in prices of heavy melting steel and other steelmaking scrap, cast scrap and other grades which have remained at ceilings, there appears a tendency for machine shop turnings to command better figures. Cancellations affecting machine shops have reduced production but demand for blast furnace use remains strong. Dealers are slow to close on current offerings, foreseeing a probable higher price. Outlook for June demand is good and a rise in machine shop turnings would affect related grades, as well.

Buffalo — Efforts by a large consumer to lower prices has caused something of a deadlock. Buying interest has practically vanished as developments are awaited. In addition to lowering offered prices one consumer has canceled all steelmaking grades. About 2400 tons have arrived recently by canal.

New York — Continued heavy demand from Pittsburgh dominates heavy melting steel buying here with prices on all grades unchanged.

Cincinnati — A small tonnage of iron and steel scrap was purchased recently by an upriver mill at ceiling prices. This was the only recent test of price in the district market, which is considered firm on heavy grades, and still tending weak on borings and turnings.

Chicago — While war cutbacks are not affecting steel mill operations, they are beginning to reduce production of scrap, with the result that demand for melting material is strengthening. Heavy melting grades of scrap are none too plentiful and hold ceiling prices firmly; less desirable material enjoys better demand and this is reflected pricewise. Confusion exists over prices on loose machine shop turnings and baled turning bundles. The \$10 mill offer on the former recently attracts little interest and consumer sales have been heard as high as \$12, this being an advance of \$1 over the previous level. A spread of \$10.50 to \$12.00 is required to represent various shades of opinion. The range of \$16.25 to \$16.75 for baled machine shop turnings is widened to a top of \$18.50, some sales at the higher level being reported.

Warehouse . . .

Warehouse Prices, Page 188

Cincinnati — Warehouse demand is being maintained near peak levels, with no apparent effect from cutbacks which are probably less severe here than in some districts. A feature is heavy sales of structurals, against which the supply has been more or less adequate. Bars, except in high carbon and certain specialties, and heavy plates, are also fairly abundant. Deliveries lag frequently when cutting and shearing are required.

Cleveland — Irregular demand for steel from warehouse is noted and at present there is a lull. Sheets are in strong demand, without letup. Assortments are fairly good, though some gaps are present. No reason is apparent for the current slack demand and renewed buying is expected to come out soon.

Los Angeles — Steady downtrend in volume of warehouse sales has held since March, which was the peak month. Shortages continue in all major items,



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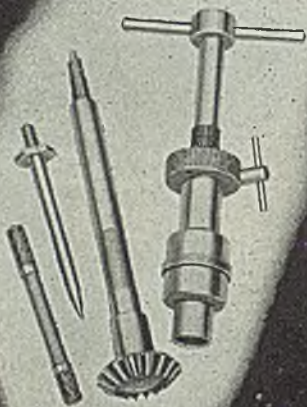
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with galvanized sheets and pipe at new lows in supply. Jobbers are troubled by OPA order to give up price increases allowed Jan. 11 and inability to pass on further mill increases put in effect May 23.

Chicago — Warehouses here will require a few more days to get caught up on deliveries to customers which were held up by the week's strike of union truck drivers ended May 22. New business holds at about the same level as recently, cutbacks in war contracts thus far being little observed. With the approaching open ending of CMP July 1, distributors are beginning to get inquiries for civilian or unrated steel.

Nonferrous Metals . . .

Nonferrous Prices, Page 191

New York — Maximum price of 4.95 cents per pound, f.o.b. point of shipment, for zinc base forming and stamping dies sold as scrap has been established. This is in line with ceilings established for other grades of zinc scrap materials. A quantity premium of one-half cent per pound is permitted on shipments of 20,000 pounds or more of the new grade either separately or in combination with die-cast scrap, old and new automobile radiator grilles, and old die-cast scrap.

Expansion of the aircraft industry during the war has resulted in greatly increased use of forming and stamping dies made of zinc base alloy. Because a larger volume of this material is expected to enter the scrap market, and in response to requests from the scrap industry, the additional classification of scrap is being provided.

Heavier use of 0.75-pound electrolytic tin plate for evaporated milk cans during the balance of the year will result in saving an estimated 645 tons of tin; about 400 tons will be conserved in last quarter when 14½ ounce cans will be fabricated in addition to six-ounce, the latter to be first made. Volume in evaporated milk cans is larger than any other type.

Cutbacks are developing in heavier volume at Connecticut brass plants. As in other districts, this is reflected in smaller demand for copper, June delivery, with trends toward reduction of inventories. Despite increasing prospects for more copper and copper alloy products in civilian production next quarter, the downward trend starting in April is not likely to be substantially halted through June and May was below April.

Copper wire mill products which a warehouse may order for stock replacement in any calendar month is increased by WPB from 25 per cent to 33 1/3 per cent of second 1944 quarter deliveries. Until July 1 warehouses also may enter deferred warehouse stock orders provided the total does not exceed 33 1/3 per cent of deliveries in second 1944 quarter.

Metallurgical Coke . . .

Coke By-Product Prices, Page 187

Pittsburgh — Some confusion surrounds the new coke prices covering beehive furnace and foundry grades. The order was not clear as to the reason for an apparent 25-cent discrimination against hand-drawn oven operators, nor is there agreement as to the effect on premium coke prices. The latter is purely an academic argument as far as the

local district is concerned, as the only producer of premium coke is now out of production and has no plans for immediate resumption. Some quarters are undecided as to the price on foundry coke, but most sellers are increasing the same 50-cent level on both furnace and foundry coke.

Steel in Europe . . .

London — (*By Radio*) — Substantial tonnages of plates are required for building locomotives, and freight cars and for boilermakers in Great Britain but shipbuilding demand is slower. Demand for sheets is the high spot in the finished steel market.

Canada . . .

Toronto, Ont. — In the Canadian steel markets as a whole, new order placing is sustained and so far cutbacks on war account have had no effect on production. Mill officials do not look for curtailment in production but point out that slackening war demand will be more than exceeded by increased requirements for expansion in manufacture of consumer goods of all types. On most lines of production mills now are almost solidly booked to the end of this year, with most recent business showing a definite swing to peacetime channels. While the government had dropped many controls all ceiling prices are being maintained. Despite the mark-up in United States steel prices and appeals made by Canadian steel producers for higher prices there has been no lifting of the ceiling at levels established at the beginning of the war. According to word from Ottawa there is no intention of permitting higher prices for steel in the immediate future. This action is taken in an effort to stop any inflationary move that might develop in the early postwar period.

Demand for steel plates continues to improve and while mills are fairly well booked, with delivery extending about three months there is no actual shortage. Announcement was made recently to the effect that the federal government soon will take over the plate mill at Halifax from Dominion Steel & Coal Corp.

Demand for merchant bars, both carbon and alloy, is only slightly behind that for sheets and mills report only small unfilled capacity to the end of the year. Demand is equally heavy for all sizes of bars. Curtailment in some branches of war production has not eased the supply situation.

Merchant pig iron sales are holding at about 8000 tons per week, with sales for the past week running approximately 5000 tons of foundry iron, 2000 tons of malleable iron and 1000 tons of basic iron. Melters, however, continue to buy as demands dictate and are receiving prompt delivery on new orders.

Scrap receipts are at top volume for the year and deliveries to steel mills are now in excess of requirements. In addition to deliveries from eastern Ontario, shipments also are being received from the mining centers in the north and from western Canada. While there has been improvement in supply of cast scrap and stove plate, dealers continue to spread their supply over as many customers as possible and there is not sufficient coming in to meet all requirements.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

- 640 tons, Aquai River bridge, Richmond, Fredricksburg & Potomac railroad, to American Bridge Co., Pittsburgh.
- 300 tons, freight depot and office building, Indianapolis, for New York Central railroad, to Midland Structural Steel Co., Cicero, Ill.; Walsh Construction Co., Cleveland, contractor.
- 290 tons, body plant, Studebaker Corp., South Bend, Ind., to Mississippi Valley Structural Steel Co., Decatur, Ill.; S. N. Nielsen Co., Chicago, contractor.

STRUCTURAL STEEL PENDING

- 2000 tons, transit sheds, Stockton, Calif., for U. S. Navy.
- 500 tons, bridge Springfield, Mass., bids June 5.
- 300 tons, manufacturing building, Columbia Pipe & Supply Co., Chicago; bids June 4.
- 300 tons, roof remodeling, Glenn L. Martin Co., Baltimore; bids closed.
- 250 tons, naval ordnance laboratory, White Oak, Md.; bids June 1.

REINFORCING BARS . . .

REINFORCING BARS PLACED

- 1000 tons, body plant, Studebaker Corp., South Bend, Ind., to Bethlehem Steel Co., Bethlehem, Pa.; S. N. Nielsen Co., Chicago, contractor; bids May 17.
- 830 tons, George Washington hospital addition, Washington, through C. H. Tompkins, that city, to Bethlehem Steel Co., Bethlehem, Pa.
- 540 tons, veterans hospital, Fargo, N. D., for U. S. Veterans Administration, to Ceco Steel Products Corp., Chicago; Hegstrom Construction Co., St. Paul, contractor; bids April 24.
- 830 tons, power station, Beloit, Wis., for Wisconsin Power & Light Co., to Concrete Steel Co., Chicago; bids May 2.
- 275 tons, expansion, Bauer & Black Div., Kendall Co., Chicago, to Bethlehem Steel Co., Bethlehem, Pa.; Avery Brundage Co., Chicago, contractor.
- 186 tons, grain elevator, Indianapolis, for Indiana Co-operative Grain Association, to Laclode Steel Co., St. Louis; G. T. Burrell, Chicago, contractor.

REINFORCING BARS PENDING

- 500 tons, veterans hospital, Sioux Falls, S. D., for U. S. Veterans Administration; McCough Bros., St. Paul, low on general contract; bids May 22.
- 275 tons, Cherryville Hill housing project; bids asked through C. H. Tompkins, Washington.
- Unstated, war housing project, 47th street, Chicago; bids June 6.

PLATES . . .

PLATES PLACED

- 177 tons, tanks, Lockport, Ill., for Globe Oil & Refining Co., to Graver Tank & Mfg. Co. Inc., Chicago; 300 tons additional abandoned.
- Unstated tonnage, steel water tank and tower, veterans' hospital, Fargo, N. Dak., to Chicago Bridge & Iron Co., Chicago, \$15,940.

PIPE . . .

CAST IRON PIPE PLACED

- 425 tons, mainly 12-inch, Andover, Mass., to U. S. Pipe & Foundry Co., Burlington, N. J.
- 140 tons, 10-inch, Quonset Point, R. I., to U. S. Pipe & Foundry Co., Burlington, N. J.
- 135 tons, 8 and 10-inch, Hartford, Conn., to U. S. Pipe & Foundry Co., Burlington, N. J.

RAILS, CARS . . .

RAILROAD CARS PENDING

- Atlantic Coast Line, 300 fifty-ton gondolas; may be placed with Brunswick Marine Construction Corp., Brunswick, Ga.
- Detroit, Toledo & Ironton, 100 seventy-ton hopper cars.

LOCOMOTIVES PLACED

Boston & Maine, three 1000-horsepower diesel switching locomotives to American Locomotive Co., and one 4000-horsepower passenger diesel to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Transition to Civilian Production Is Slow

(Concluded from Page 76)

large portion of the people will be doing what they always have done.

WPB Chairman Krug estimates that of the 51,200,000 civilian workers, 44,600,000 are in jobs which will continue regardless of munitions schedules and that only 6,600,000 are in jobs likely to be affected by cutbacks. A breakdown of employment shows 7,750,000 in agriculture, 3,800,000 in transportation and utilities, 600,000 in construction, 800,000 in mining, 11,400,000 in trades and services, 800,000 in iron and steel manufacturing, 2,000,000 in machinery manufacturing, 7,700,000 in other manufacturing, 4,400,000 in government (excluding war agencies), and 5,350,000 in miscellaneous industries unlikely to be affected by cutbacks. In the munitions industries are 1,600,000 in aircraft, 1,300,000 in shipbuilding, 1,800,000 in ordnance and signal equipment, 300,000 in war chemicals and 1,600,000 in federal war agencies.

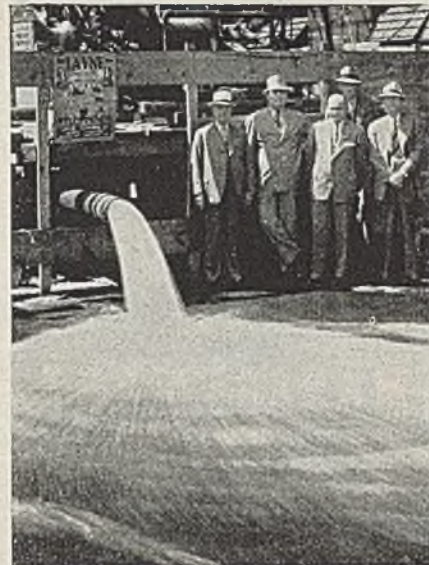
Mr. Krug's assumption that workers in iron and steel, machinery and other manufacturing, transportation, construction and other civilian activities will not be affected by cutbacks in the war program appears fallacious; these essentially civilian activities certainly will reflect any diminution in the munitions program in decreased employment.

In the matter of tools and facilities for civilian products, the picture is spotty. New tools in many cases cannot be obtained in under eight months. Some manufacturers may be able to call upon their ingenuity and improvise facilities for the transition period, but orderly and efficient assembly lines for many civilian manufacturers are not in immediate prospect.

WPB has made a good start in relaxing its controls. Out of a total of 650 orders and schedules in effect April, 156 already have been revoked and an additional 83 will be lifted within the next six weeks.

Guidance in reconverting to peacetime goods is being offered in the appointment of reconversion chairmen for about 400 industries. These men will help the various industries in their reconversion problems by acting as liaison between the government and the industry and in other ways.

Other agencies are moving toward meeting the reconversion problem. The Surplus Property Board is offering to sell government-owned machine tools and other equipment in manufacturers' plants immediately. Small manufacturers making essential civilian products are being offered loans by the Smaller War Plants Corp. on a liberalized basis. SWPC has authorized its regional agents to make loans up to \$50,000 without awaiting



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War Manpower Commission called 48 top management and labor officials to Washington last Friday for a discussion

of manpower and production problems as they have developed since the defeat of Germany. From this meeting, WMC expects to obtain definite recommendations for the timing of relaxation of its controls.

CONSTRUCTION AND ENTERPRISE

OHIO

ARCHBOLD, O.—King-Wise Mfg. Co. plans a two-story 100 x 200-foot farm implement manufacturing plant to cost about \$200,000. Britsch & Munger, Nicholas building, Toledo, O., are architects.

CANTON, O.—Tomco Inc. has been incorporated to manufacture machine parts, tools and equipment by M. J. White and associates, with \$500 capital and 500 shares no par value. Wesly Meinerding is agent.

CLEVELAND—Oster Mfg. Co., 2067 East Sixty-first place, will build a one-story 84 x 146-foot machine shop addition and make alterations to present plant, at cost of \$52,000.

CLEVELAND—Stainless Welding & Mfg. Co. has been incorporated with \$500 capital and 3750 shares no par value to manufacture stainless steel products, by Horace C. Voloun, 1180 Union Commerce building, and associates.

CLEVELAND—Euclid Road Machinery Co., 1361 Chardon road, care E. H. Parkhurst, has purchased two adjoining parcels comprising 35 acres at St. Clair avenue and East 222nd street as first step in plant expansion when restrictions are relaxed.

CLEVELAND—Grinders & Fixtures Inc. has been formed by George C. Auer, president, and C. B. Saunders, vice president, to acquire manufacturing rights of circular leaf grinders and index heads from Cleveland Tool Engineering Co., 1255 West Fourth street. Company will be located at that address until other space is obtained.

COLUMBUS, O.—Jaeger Machine Co., 550 West Spring street, has let contract to Robert T. Setterlin & Son, 1030 South Third avenue, for a one-story, 132 x 278-foot foundry, to cost about \$80,000. A. Lyman, care owner, is architect.

FINDLAY, O.—Master Tire & Rubber Co., J. F. Schaefer, president, Lime and Western avenues, has let contract to the Austin Co., 16112 Euclid avenue, Cleveland, for a one-story 100 x 340-foot truck tire plant, estimated to cost about \$180,000.

MEDINA, O.—Henry Furnace Co., H. F. Bradway, manager, is converting its 50 x 200-foot tin shop to shell container production exclusively, much heavy equipment being installed.

MT. VERNON, O.—Cooper-Bessemer Corp., North Sandusky avenue, will build a diesel engine plant at cost of \$14,000, starting immediately.

McCONNELLSVILLE, O.—Cambridge Tool Corp., W. J. Blazier, vice president, care Lempeco Products Inc., 5400 Dunham road, Bedford, O., plans a one-story plant to cost about \$750,000.

ILLINOIS

CHICAGO—Ingersoll Steel & Disc Division of Borg Warner Corp., 310 South Michigan avenue, is having plans drawn by A. J. Boynton & Co., engineers, same address, for a one-story 130 x 400-foot plant addition.

CHICAGO—Columbia Pipe & Supply, 3610 South Morgan street, will let contract soon for a one-story plant. A. Epstein, 2001 West Pershing road, is engineer.

EL PASO, ILL.—City council has authorized Warren & Van Praag Engineering Co., Decatur, Ill., to draw plans for a water softener system, including building and equipment, estimated to cost about \$58,000.

HERRIN, ILL.—Borg-Warner Corp., Howard E. Blood, president, 310 South Michigan avenue, Chicago, is negotiating for a factory site at Herrin where its Norge division plans to concentrate its laundry equipment production.

COLORADO

DENVER—Denver Glass Bottle Co., 3557 Wazel street, will let contract soon through E. G. Groves, architect, Temple Court building, for one and two-story 60 x 100-foot and 56 x 60-foot L-shaped bottle manufacturing plant to cost \$75,000 to \$100,000.

MINNESOTA

MINNEAPOLIS—V. A. Boker & Sons, 3104 Snelling avenue, manufacturer of machinery and metal stampings, has let contract to Victor Carlson & Sons Inc., for a one-story machine shop addition 25 x 115 feet.

MINNEAPOLIS—Micromatic Metal Products Co., 1921 Bryant avenue South, has been incorporated to manufacture screw machine products, by Hyman Edelman, Sidney Larber and E. A. McGarvey.

IDAHO

KELLOGG, IDAHO—Bunker Hill & Sullivan Mining & Concentration Co. plans a 250-ton ore mill at Sidney mine, to cost about \$200,000.

MONTANA

ROUNDUP, MONT.—Roundup Coal Mining Co. plans to open new coal mine with 3500 tons daily capacity, with railway spur.

MUSCATINE, IOWA—H. J. Heinz Co. has let contract to J. H. Hunzinger Co., Security building, Davenport, Iowa, for a one-story plant 180 x 300 feet, to cost about \$200,000.

SOUTH DAKOTA

HURON, S. DAK.—Graham Distilling Co., H. H. Graham, president, plans immediate construction of an industrial alcohol plant to cost about \$300,000.

ARKANSAS

BLYTHEVILLE, ARK.—Southern Mfg. Co., A. A. Mauley, president, plans erection of a plant costing about \$50,000.

JONESVILLE, ARK.—Hargrove Industries Inc., plans erection of Soybean crushing plant and cottonseed oil mill to cost about \$150,000.

MICHIGAN

DETROIT—Hydraulic Services Inc., 1440 Garland avenue, has been incorporated with \$1000 capital to manufacture hydraulic machinery and equipment, by Claude W. Albers, 1440 Oakland avenue.

DETROIT—Shreve, Anderson & Walker, 914 Marquette building, has been given contract for manufacturing and office building at Middleville, Mich., for the White Products Corp.

GRAND RAPIDS, MICH.—Grand Rapids Brass Co., has let contract to Strom Construction Co., Grand Rapids, for an additional plant building, to cost about \$87,000.

HIGHLAND PARK, MICH.—Utility Tool & Mfg. Co., 12236 Second avenue, has been incorporated with \$25,000 capital to manu-

factory machinery and equipment, by August A. Leberman, 16 Cortland street, Highland Park.

CONNECTICUT

NEW HAVEN, CONN.—New England Die Casting Co., 54 Grant street, West Haven, has plans by L. Asheim, 211 State street, Bridgeport, Conn., for a 50 x 200-foot factory on Front street, to cost about \$40,000.

PLAINFIELD, CONN.—Plastic Film Corp., care architect, is having plans drawn by L. F. Caproni, 1221 Chapel street, New Haven, Conn., for a one-story 42 x 200-foot plant addition, four reinforced silos and a 30 x 100-foot platform, to cost about \$45,000.

RHODE ISLAND

PROVIDENCE, R. I.—Hugold Anderson, 36 Garnet street, has plans under way by E. O. Ekman, 1016 Turks Head building, for a two story 48 x 93-foot factory, to cost over \$40,000, with equipment.

MASSACHUSETTS

INDIAN ORCHARD, MASS.—Nixon Specialty Co., 36 Berkshire street, has revised plans by E. P. Dorgan, 838 Chestnut street, Springfield, Mass., for one-story 40 x 50 and 50 x 122-foot plant buildings on Berkshire street, former bids being rejected.

PITTSFIELD, MASS.—General Electric Co., 1 Plastics avenue, has let contract to E. J. Cramer, 28 North street, for a one-story plastics plant, including laboratory and machine shop, estimated to cost about \$40,000.

NEW YORK

BUFFALO, N. Y.—Small Steel Castings Inc. has been incorporated by Joseph J. Cheney, president, and will operate a foundry at 343 Howard street, where equipment costing about \$100,000 is being installed. After termination of contracts for war work, automotive and agricultural work will be done.

PENNSYLVANIA

LANCASTER, PA.—Lehigh Foundries Inc., Lancaster, has taken over operation of the Lancaster plant of the Merchant & Evans Co. and plans a \$150,000 postwar program of refrigeration compressor production.

PORT ALLEGHANY, PA.—Pittsburgh Corning Corp. has let contract for design and construction of a plant addition for production of foamglass, to John W. Cowper Co. Inc., Sidway building, Buffalo, to cost about \$100,000.

SUNBURY, PA.—Susquehanna Wire Rope Co., recently formed to manufacture a new type of wire rope by a process developed by Prof. William T. MacCreddie of Bucknell University, has leased space in the C. W. Rabuck warehouse and will start operations early in June.

INDIANA

RICHMOND, IND.—Richmond Automatic Screw Corp., 1234 South Ninth street, has been incorporated with 100 shares no par value, by H. Smith, G. Lee Laughlin and Howard E. Sill.

WINCHESTER, IND.—Overmyer Mould Co. of California Ltd. has been incorporated with 4000 shares at \$50 per share, to manufacture dies, castings and molds, by C. P. Overmyer Sr. and associates.

MISSOURI

ST. LOUIS—Stok-A-Fire Co., 6504 Olive street, has bought 125 x 150 feet adjoining its plant for plant expansion.

ST. LOUIS—William R. Warner & Co. Inc.,

404 South Fourth street, plans a six-story plant to cost over \$500,000.

ST. LOUIS—Cupples Co., Seventh and Spruce streets, manufacturer of tubes, cutters, etc., has bought site at Vandeventer and McRee avenues for a new plant.

ST. LOUIS—Braznell Co., 2227 Walnut street, manufacturer of printing inks, plans one-story plant at Market and Jameton streets.

WISCONSIN

MADISON, WIS.—Gisholt Machine Co., manufacturer of turret lathes and other machine tools, plans two-story engineering building 60 x 150 feet. Law, Law, Potter & Nystrom are architects.

MADISON, WIS.—Badger Mfg. & Supply Co. has been incorporated with 100 shares at \$10 each to deal in machinery, motors and electrical appliances, by F. D. Shuttleworth, 1 West Main street, Madison.

MILWAUKEE—Frabill Mfg. Co. has been incorporated by Frank Matras, 4953 Ardmore avenue, and associates.

MILWAUKEE—Metal Coatings Inc. has been incorporated with 250 shares at \$100 each to do plating, pickling, coloring and related processes, by Clarence F. Graham, 6913 Cedar street, Wauwatosa, Wis.

NORTH FOND DU LAC, WIS.—Northern Aluminum Co. has been incorporated with 100 shares no par value to operate a non-ferrous foundry, by Richard Callender and associates.

CALIFORNIA

GLENDALE, CALIF.—Kinnear Motors, 605 West Colorado street, is making alterations and additions to its plant at cost of about \$15,000.

LOS ANGELES—Vapor Engineering Corp. has been incorporated with \$50,000 capital by F. P. Trinkhaus, Los Angeles, and associates. Louis Lombardi, 510 West Sixth street, is representative.

LOS ANGELES—Munson Machine Products Co. has been incorporated with \$75,000 capital by Walter S. Munson, Inglewood, Calif., and associates. Louis Lombardi, 510 West Sixth street, Los Angeles, is representative.

LOS ANGELES—Smithson Co. has been formed by W. K. Smithson and J. M. Caldwell and has established a machine shop at 219 South Mednik street.

RIVERSIDE, CALIF.—Valley Motor Parts & Machine Shop has been formed by S. L. Holmes and F. D. Echols and has its plant at 3372 Eighth street, Riverside.

SAN DIEGO, CALIF.—Solar Aircraft Co. has building permit for addition to test building at 1212 West Juniper street, 30 x 60 feet.

DPC Authorizes Plant Expansion, Equipment

Defense Plant Corp. has authorized the following expansions and equipment purchases (figures are approximate):

Rohm & Haas Co., Philadelphia. \$615,000 for equipment at a plant in Bristol, Pa., for production of war chemicals.

Leland Electric Co., Dayton, O., \$80,000 for equipment at a plant in Dayton for production of electric motors.

Western Electrochemical Co., Los Angeles, \$5 million to provide equipment in part of the Basic Magnesium plant at Las Vegas, Nev., for production of potassium perchlorate.

Hegeler Zinc Co., Danville, Ill., \$75,000 to provide plant facilities at Danville, for production of strip zinc.

Servel Inc., Evansville, Ind., \$50,000 increase in contract to provide additional equipment at a plant at Evansville.

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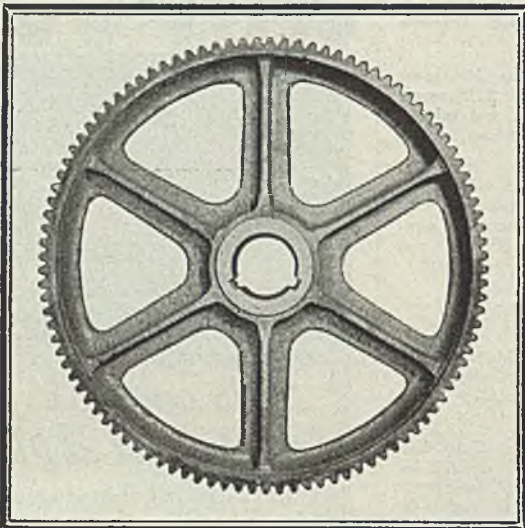
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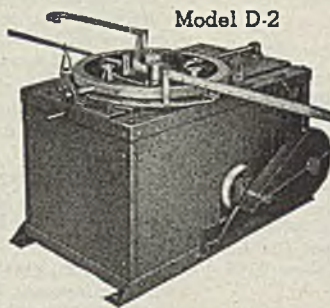
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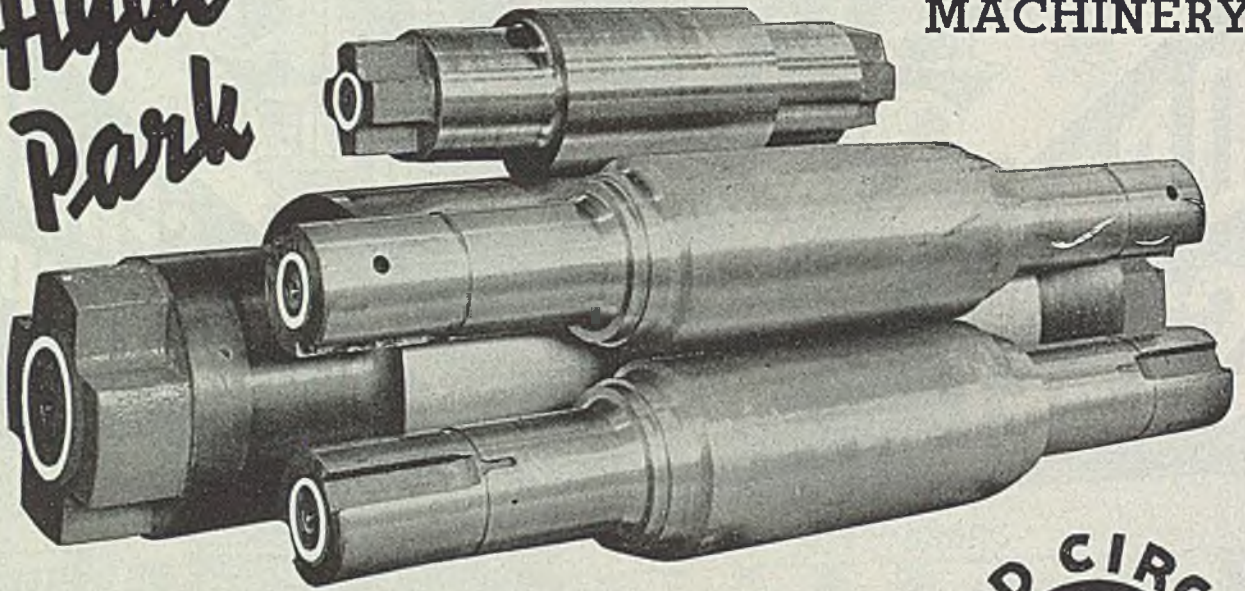
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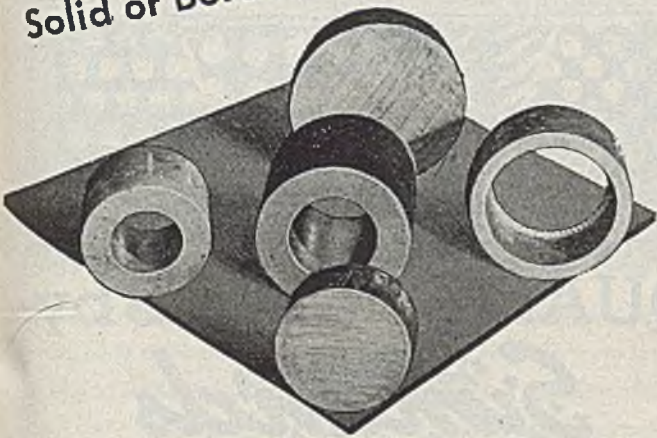
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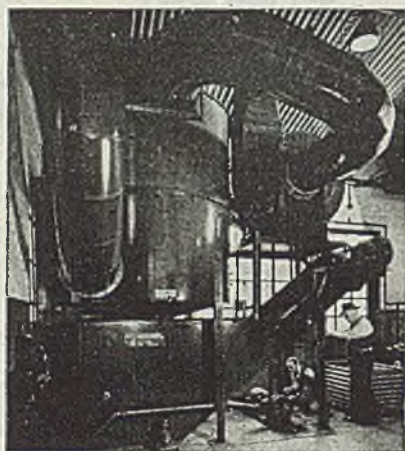
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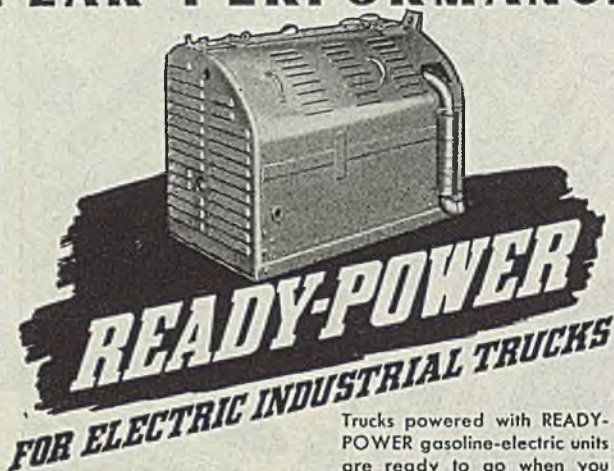
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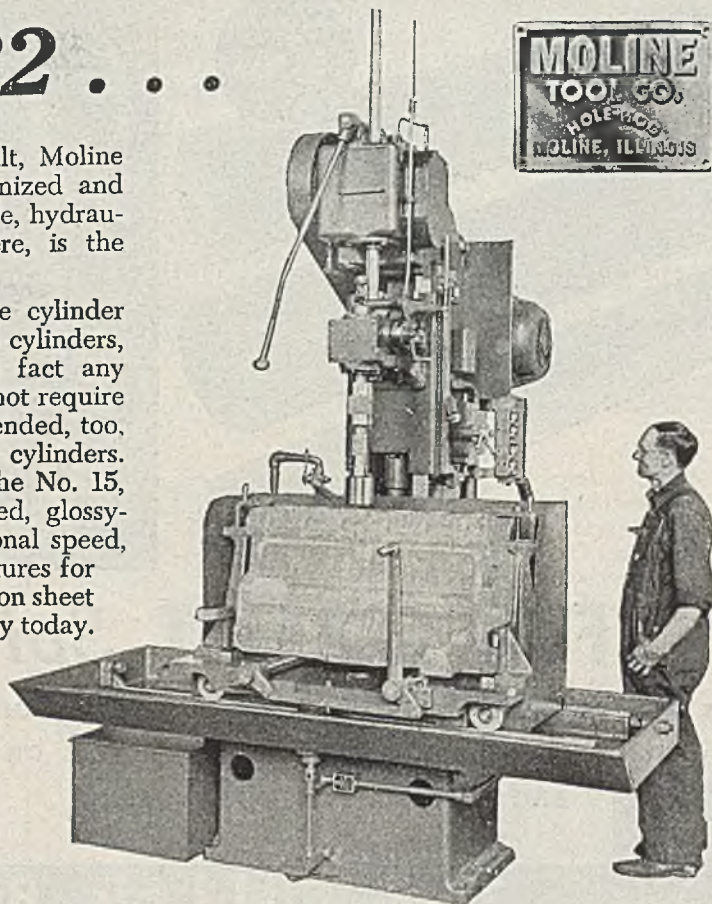
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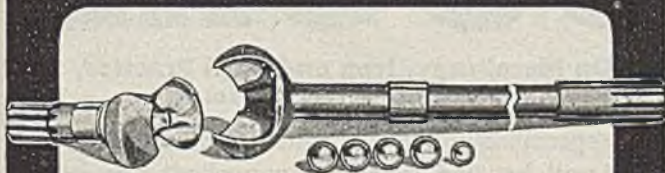
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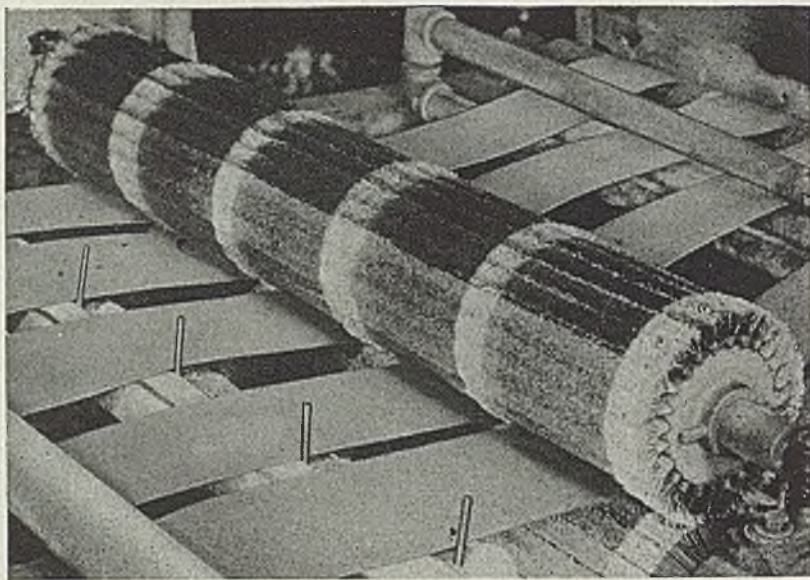
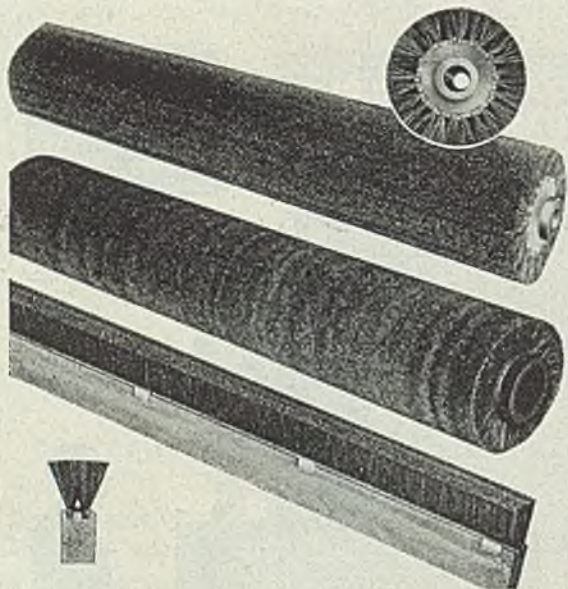
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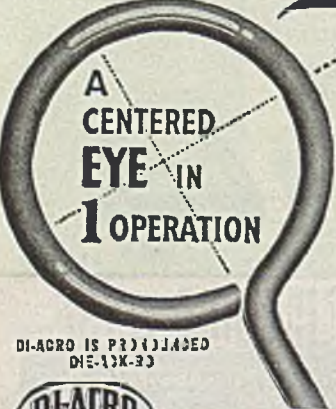
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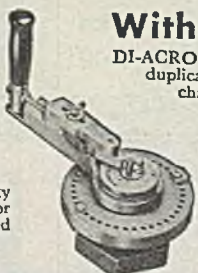

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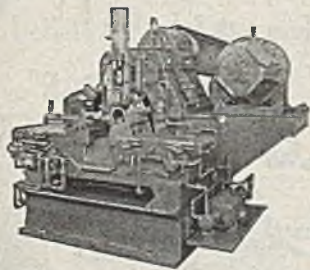
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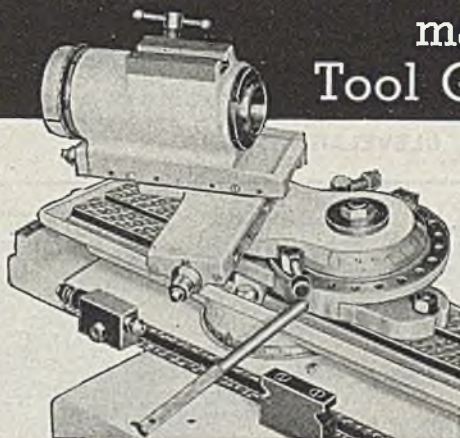
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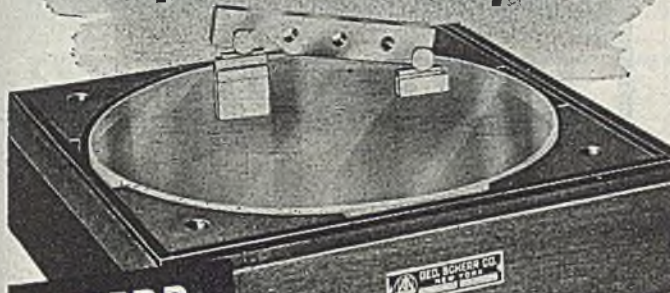
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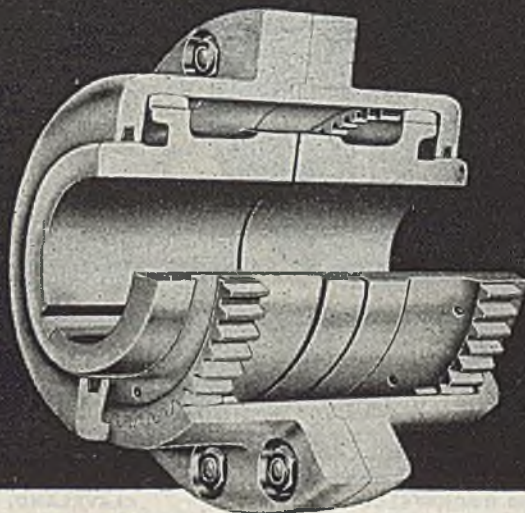


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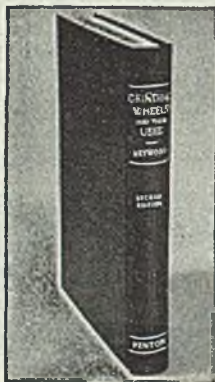
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ADVERTISING INDEX

A		Eureka Fire Brick Works	212	O	
Abrasive Co.	6	F		Oakite Products, Inc.	21
Aircraft Mechanics, Inc.	193	Farrel-Birmingham Co., Inc.	52	Ohio Galvanizing & Mfg. Co., The	209
Allegheny Ludlum Steel Corp.	8	Federal Screw Works	138	Ohio Locomotive Crane Co., The	210
Allen-Bradley Co.	33, 34	Fallansbee Steel Corp.	141	Ohio Seamless Tube Co., The	159
Allis-Chalmers Mfg. Co.	Inside Front Cover, 9	Foster, L. B., Co.	213	Oliver Iron & Steel Corp.	142
Aluminum Company of America	153	Frasse, Peter A., & Co., Inc.	43	O'Neil-Irwin Mfg. Co.	208
American Chain & Cable Co., Inc., American Chain Division	152	Fuller Brush Co., The	208	Ozalid Division of General Aniline & Film Corp.	155
American Chain Division of American Chain & Cable Co., Inc.	152	G		P	
American Crayon Co., The	197	Gates Rubber Co., The	30	Parker Appliance Co., The	59
American Foundry Equipment Co.	150	General Chemical Co.	19	Paxson Machine Co.	178
American Hot Dip Galvanizers Assn., Inc.	64	General Electric Co.	38, 177	Pickands Mather & Co.	57
American Petrometal Corp.	210	Gerding Bros.	215	Pittsburgh Commercial Heat Treating Co.	206
American Pipe Bending Machine Co., Inc.	203	Gisholt Machine Co.	25	Pittsburgh Plate Glass Co., Brush Division	56
Ampco Metal, Inc.	146	Gordon, Claud S., Co.	202	Pittsburgh Steel Foundry Corp.	133
Associated Engineers, Inc.	200	Grant Gear Works	196	Plan-O-Mill Corporation	42
Athenia Steel Co., The	63	Greenspon's, Jos., Son Pipe Corp.	213	Poole Foundry & Machine Co.	211
Atlas Drop Forge Co.	169	Gulf Oil Corp.	143	Porter, H. K., Co., Inc.	Front Cover
Atlas Lumnite Cement Co., The	48	Gulf Refining Co.	143	Prevost Machine Products	198
Atlas Metal Stamping Co.	40	H		R	
Atlas Tool & Designing Co.	40	Hanna Engineering Works	29	Rail & Industrial Equipment Co.	213
B		Hanlon-Gregory Galvanizing Co.	117	Ransohoff, N., Inc.	194
Babcock & Wilcox Co., Refractories Div.	124	Harnischfeger Corp.	209	Ready-Power Co.	206
Baker & Adamson Division of General Chemical Co.	163	Harrington & King Perforating Co., The	174	Reconstruction Finance Corp.	157
Baldwin Locomotive Works, Standard Steel Works Division	131	Haskins, R. G., Co.	197	Reliance Steel Division Detroit Steel Corp.	54
Bartlett, C. O., & Snow Co.	156	Heil Engineering Co.	212	Remmey, Richard C., Son Co.	158
Basic Refractories, Inc.	5	Hendrick Manufacturing Co.	202	Republic Steel Corp.	41, 65
Beall Tool Co.	203	Heppenstall Co.	149	Reynolds Metals Co.	50, 51
Belmont Iron Works	210	Hevi-Duty Electric Co.	173	Richards, G. Whitfield	35
Benedict-Miller, Inc.	210	Hobart Bros. Co.	101	R-S Products Corp.	162
Bethlehem Steel Co.	1	Holliday, W. J., & Co.	36	Ryerson, Joseph T., & Son, Inc.	73
Bison Forge Co.	211	Horsburgh & Scott Co., The	130	S	
Bixby, R. W., Inc.	214	Houghton, E. F., & Co.	60	Saginaw Malleable Iron Division of General Motors	45
Blanchard Machine Co., The	119	Hubbard, M. D., Spring Co.	205	Schneible, Claude B., Co.	206
Bridgewater Screw Products Co.	215	Hyatt Bearings Div., General Motors Corp.	90	Scherr, George, Co., Inc.	211
Brooke, E. & G., Iron Co.	212	Hyde Park Foundry & Machine Co.	204	Scovill Manufacturing Co.	179
Browning, Victor R., & Co., Inc.	219	I		Seneca Wire & Mfg. Co., The	210
Brush Development Co., The	170	Industrial Oven Engineering Co., The	204	Seymour Manufacturing Co., The	58
Buffalo Bolt Co.	61	Ingersoll Steel & Disc Division, Borg-Warner Corp.	136	Shenango-Penn Mold Co.	151
Buffalo Forge Co.	17	Inland Steel Co.	74	Silent Hoist & Crane Co.	176
Bundy Tubing Co.	16	International Nickel Co., Inc., The	70	Simonds Gear & Mfg. Co., The	206
Bunting Brass & Bronze Co., The	184	Iron & Steel Products, Inc.	213	SKF Industries, Inc.	28
C		J		Socony-Vacuum Oil Co., Inc.	24
Carboloy Co., Inc.	115	James, D. O., Manufacturing Co.	202	Sonken-Galamba Corp.	213
Carborundum Co., The	14	Johnson Bronze Co.	182	Standard Steel Works Division, Baldwin Locomotive Works	131
Ceilcote Co., The	212	Johns-Manville	32	Standard Tube Co., The	31
Century Electric Co.	137	Jones & Laughlin Steel Corp.	135	Sticht, Herman H., Co., Inc.	212
Chicago Perforating Co.	206	K		Strom Steel Ball Co.	207
Chisholm-Moore Hoist Corp.	132	Kardong Brothers, Inc.	202	Sundstrand Machine Tool Co.	55
Chromium Mining & Smelting Corp., Ltd.	47	Kennametal, Inc.	145	Sun Oil Co.	99
Cincinnati Grinders, Inc.	86, 87	King Foundries, Inc.	215	T	
Cincinnati Milling Machine Co., The	86, 87	Kondor Products Corp.	164	Taylor-Wilson Mfg. Co.	209
Clark Tractor Div. of Clark Equipment Co.	134	Korfund Co.	160	Thomas Machine Manufacturing Co.	178
Cleveland Crane & Engineering Co., The	139	L		Titan Metal Manufacturing Co.	154
Cleveland Punch & Shear Works Co., The	12	Lakeside Steel Improvement Co., The	161	Toledo Stamping & Manufacturing Co.	211
Cleveland Twist Drill Co., The	171	Landis Machine Co.	10, 11	Torrington Co., The	165
Cleveland Worm & Gear Co., Inside Back Cover		Layne & Bowler, Inc.	199	Towmotor Corp.	148
Climax Molybdenum Co.	93	Lee, K. O., Co.	209	Turner Gauge Grinding Co.	172
Commercial Forgings Co., The	205	Lovejoy Flexible Coupling Co.	211	U	
Consolidated Machine Tool Corp.	37	M		Udylite Corp, The	144
Continental Steel Corporation	13	Mackintosh-Hemphill Co.	183	Union Carbide & Carbon Corp.	53
Cowles Tool Co.	210	Mahon, R. C., Co., The	68	United States Steel Corp., Subsidiaries	15, 48
D		Matthews, Jas. H., & Co., The	207	United States Steel Supply Co.	15
Davis Brake Beam Co.	211	Meaker Co., The	195	V	
De Laval Steam Turbine Co.	66	Medart Co., The	168	Vinco Corporation	44
Delta Manufacturing Co., The	166	Merrill Brothers	208	Yulcan Iron Works	26, 27
Detroit Power Screwdriver Co.	140	Michigan Seamless Tube Co.	18	W	
Detroit Steel Corp., Reliance Steel Division	54	Mid-States Equipment Co.	201	Walker-Turner Co., Inc.	147
Diamond Mfg. Co.	210	Midvale Co., The	22	Washburn Wire Co.	49
Differential Steel Car Co.	210	Moline Tool Co.	207	Wean Engineering Co., Inc.	Back Cover
Disston, Henry, & Sons, Inc.	167	Monarch Machine Tool Co., The	2, 3	Weinman Pump & Supply Co., The	210
Donaldson Co., Inc.	192	Morgan Lumber Sales Co.	174	Weirton Steel Co.	67
Dow Corning Corp.	123	Motor Products Corporation	39	Wheeling Steel Corp.	210
Drake Steel Supply Co.	203	N		Wickwire Brothers, Inc.	209
Dulien Steel Products, Inc.	213	National Acme Co., The	62	Williams, J. H., & Co.	211
E		National Annealing Box Co.	204	Wood Shovel & Tool Co., The	121
Edison, Thomas A., Inc.	127	National Forge & Ordnance Co.	20	Worth Steel Co.	175
Electro Metallurgical Co.	53	National Lead Co.	23	Y	
Enterprise Galvanizing Co.	212	National Screw & Mfg. Co., The	129	Yoder Co., The	46
Erdle Perforating Co., The	204	National-Standard Co.	63		
		National Steel Corporation	67		
		New York & New Jersey Lubricant Co.	205		
		Nilson, A. H., Machine Co.	215		
		Northwest Engineering Co.	7		