Posters Like This Help Get Suggestions, Raise Output At RCA, See P. 34

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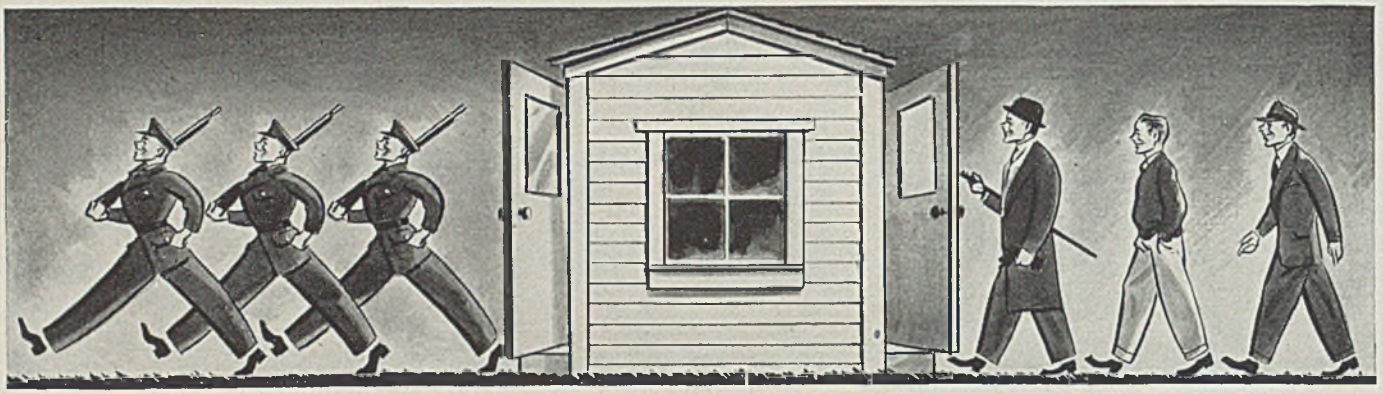

Quick Changeovers for War Work

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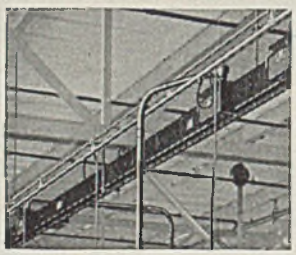
For every quick changeover you're making today, there'll be other changeovers tomorrow. New plants as well as old may be called on to make fast changes in production to meet the nation's needs.

So, whether you're modernizing or building, make sure your power and light circuits are planned to facilitate fast changes in the arrangement of machines. Ask your GRAYBAR representative to help you or your contractor choose the type of electrical distribution system that's most flexible for meeting both present and future needs.



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HIGHLIGHTING

this issue of STEEL

NEWS "In spite of the cry 'not enough steel', it is not possible that there can be any shortage of supply for the war program," declared Walter S. Tower, president, American Iron and Steel Institute, addressing the group last Thursday (p. 38). "There are indications that ability to make steel for war purposes will be in excess of ability of fabricating industries to convert steel products into ships, aircraft, guns, tanks, trucks and projectiles." This assurance is in sharp contrast to a charge of "criminal neglect to expand the steel industry" made by the United Steelworkers of America. The "USA-CIO", meeting at the same time as the institute, "waived" premium payments for Saturdays and Sundays in a 40-hour stretch—"in the interests of national unity" (p. 68), but held to its demand for a wage increase.

After all, management's problems under the circumstances are simple compared with those confronting the government. Should new war plant construction (p. 41) be checked or stopped? What is the best course to pursue in the transportation problem (p. 51) as it affects armament centers such as Detroit?

National Metal Trades Association's job-rating plan has been installed in 325 plants, covers many occupations, as reported in the association's annual meeting (p. 66). Freezing wages by classification, it was said, would be more equitable than freezing wages "as of a certain date." The porcelain enameling industry met in Cincinnati (p. 62) and considered ways and means of converting its heat-treating facilities to war work.

Thirty-six steel executives (p. 47) have been appointed to four OPA advisory committees. Resources Protection Board (p. 47) has been established by WPB to evaluate relative importance of industrial plants, installations and their military possibilities. Production Requirements Plan specialists have been assigned to regional WPB offices (p. 47) to facilitate change-over to the plan by more companies June 30. Used Construction Machinery Section has been set up (p. 46) in the Division of Industry Operations.

PRODUCTION Launching of two more U. S. Steel Corp. ore vessels (p. 59) was a feature of Maritime Day. Armor plate output by a leading producer will be tripled (p. 43) this year. Current steel ingot rate (p. 43) is off ½-point to 99 per cent. Wing Tips (p. 54) reports assembly of Flying Fortresses 70 per cent ahead of schedule. RCA's "Beat the Promise" campaign (p. 34) has increased production 160 per cent. Army-Navy Star (p. 64) has been established to reward machine tool companies for meritorious service.

TECHNICAL G. S. Evans presents details of recent developments in desulphurizing cast iron. He tells (p. 82) how rapid metallurgy makes use of the cupola, bessemer converter and electric furnace. About 70 per cent of the sulphur and phosphorous are removed by ladle treatment.

Monorail handling system (p. 90) with individual branch lines for each machine saves both time and money in handling heavy pieces of steel in a die shop.

"What can I do to speed war production?" is answered by Frederick B. Heitkamp. This message (p. 76) from a man in the midst of war production problems has much of value for all of us.

More precise calculation of stresses enables boat crane booms to be designed and constructed of welded tubular members (p. 96) in such a manner as to cut 6000 pounds from weight of a typical boom. Tubular sections, combined with gusset plates, fully utilize strength of the weld metal and load all portions of the boom uniformly.

Automatic spray pickling cuts heat-treating costs by combining continuous annealing furnaces with equipment for pickling, washing and drying the work in one continuous operation (p. 78). Such a setup offers an important means for reducing amount of handling involved.

Professor Macconochie continues STEEL'S forging series by presenting (p. 72) an analysis of modern forging furnaces, including latest types of rotary-hearth and electrically heated models. An important new development is the combination burner which burns both gas and oil simultaneously.

MARKETS OPA has established maximum prices on bolts, nuts, screws and rivets (p. 127), and has reduced stock sizes from 450,000 to 250,000.

Permission to two steelmakers to charge prices above ceiling have been withdrawn by OPA (p. 128).

★There IS Something you can do to get STEEL more quickly!

Steel deliveries are a problem! Stocks are depleted, mill deliveries delayed, priorities strictly enforced, demands heavier as war production intensifies! But there *is* something you can do about it—several things, in fact! Work closely with Ryerson on your requirements, and follow the common sense rules of action.

1 Make sure of your priority status.

(a) If you are engaged in direct war production and require immediate stock shipments from time to time, be sure to properly extend to us applicable priority ratings. This should be done by extending any blanket rating in the manner required by the blanket under which you are operating or by properly endorsing purchase orders, as in the case of priority ratings based on certificates.

(b) If you are not directly engaged in war production work, check up on the proper rating for your repair and maintenance requirements, because effective after May 4, a new order, amendment No. 4, supplementary to General Preference Order M-21-b, establishes closer control and greater limitations on the distribution of steel.

2 Because of the importance of following Government regulations to the letter, make sure that your orders are formally endorsed, using the proper forms when necessary. This will preclude the possibility of further correspondence that might delay shipment, or prior sale of material.

3 When possible, send orders — not inquiries. This is entirely safe because of the long-established Ryerson one-price policy. It is possible the steel, if in stock, might be sold while we are answering your inquiry.

4 Whenever practicable, state what alternate sizes, shapes, or types of steel you can use if the desired steel is not in stock.

5 It is also helpful to indicate the size or length to which the steel will be cut so that we may fit your requirements to available sizes and lengths when regular sizes and lengths are not in stock.

We are most anxious to help you with every problem of steel procurement or application, during these critical days! Do not hesitate to keep closely in touch with us.

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STEEL

May 25, 1942

A SYSTEM STRONG IN WAR, STRONGER IN PEACE!

Last Thursday President Walter S. Tower told members of the American Iron and Steel Institute that the "United States alone has been producing recently each month about as much steel as Japan probably is able to produce in a year. Your industry can make every six days as much as Italy can make in six months, and it is producing at nearly three times the probable rate of all the European industry which is under German control or is available to Germany."

"To put it another way," stated Mr. Tower, "the United States alone has double the critical material strength, measured in tons of steel, that is now possessed by all the enemy countries."

This superiority is vital to victory. Without the facilities for making these unprecedented tonnages of steel, this nation could not even contemplate, much less achieve, its ambitious goals for war production in 1942 and 1943. Few persons realize how these goals dwarf the actual performance in World War I. Here are the comparisons:

	Approximate U.S. Output World War I	President's Goal 1942	President's Goal 1943
Tanks	500	45,000	75,000
Planes	12,000*	60,000	125,000
Ships, tons	4,000,000	8,000,000	15,000,000

* About 8000 of these were training planes.

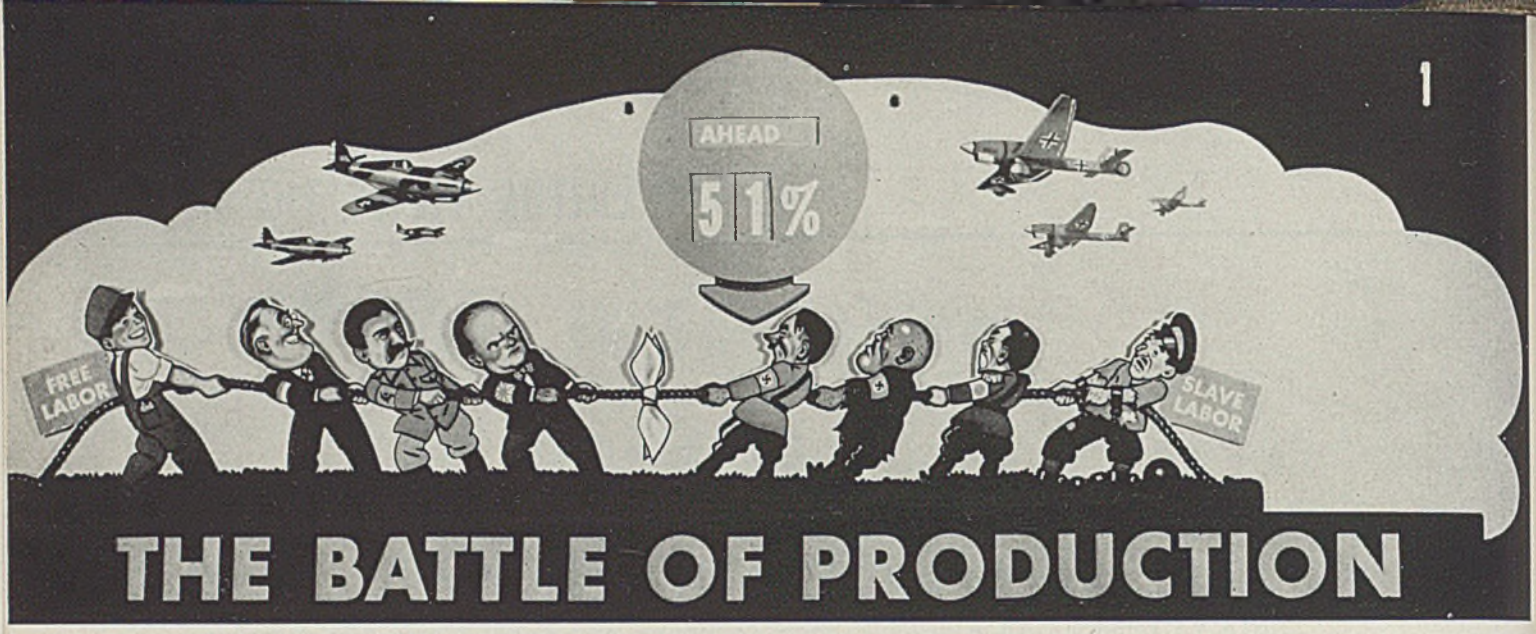
That we can count upon enough steel to make in one year 90 times as many tanks, five times as many planes and twice as many tons of ships as we turned out in the war period of 1917-18 is not due to happenstance. The iron and steel industry is efficient, strong and in a large measure prepared for this emergency job because in years gone by men had courage and vision enough to invest their time, money and skill in private competitive enterprise.

In recent years, the system under which they made the iron and steel industry strong has been under severe attack. It merits better treatment. It deserves to be studied, improved, understood and protected.

Cherish it, and after it has won the war it will be ready to win the peace!

E. L. Shaner

Editor-in-chief



THE BATTLE OF PRODUCTION

RCA's Amazingly Successful "Beat The Promise" Campaign ups

FOR A REAL slap-bang, whooper-up, let's-get-going campaign for increasing production, one of the most spectacular is the "Beat the Promise" program being conducted by the RCA Mfg. Co. Inc., Camden, N. J., at its home and four branch plants employing more than 20,000 men and women. While it is always difficult to compare such campaigns, it appears safe to say that few, if any, have topped it in effective results. It is a program that today is probably attracting more wide-spread interest than any other company-sponsored activity of its kind in the country.

This program has been going on since early last fall, with enthusiasm still running high and with no special let-up in sight. Thus it is different from so many such programs, which have their moment of brilliant light only to fade into a darkness deeper and blacker than ever before.

What then are its special features and what is sustaining it? Clearly there are evidences of less fanfare as time goes on, and that is as it should be for even that can be maintained to a point where it fails to register and in time grows boring. Besides, the broad strategy has been laid out, the program duly launched, and the employes thoroughly familiarized with the fundamental objectives.

However, this does not imply that fanfare is being dropped—far from it. For notwithstanding the fact that the country is now at war and that patriotism is a potent stimulating force in itself, certain continued dramatization and color are necessary. Despite growing appreciation of the military odds to be overcome, and quickly, if the war is to be won at all, and of the importance of peak production to this end, much has to be done in keeping before the individual his part in contributing to the main objective of winning the war and in keeping mind and spirit as buoyant as possible. Morale building activities (although of a somewhat different order) are essential to military forces; so, likewise, does the company contend, are they essential to soldiers of production in warding off monotony of routine and thus stimulating mental and physical alertness.

But any program to be kept going effectively by whatever degree or type of dramatization and fanfare must, of course, be conceived on sound principles in the beginning. To the average American, at least, competition is very much the breath of life. Consequently, it is not surprising that the cornerstone —in fact the whole foundation—of the RCA program lies in the development of the competitive spirit in both individual and group efforts—and in co-operation and team work to give it full effectiveness.

Plants, divisions and departments are lined up on a soundly competitive basis. Each of the five plants of RCA is judged by its performance (1) against its production schedule; (2) in relation to performance of other plants; and (3) in submitting the largest number of acceptable suggestions for improving efficiency and economy of operation.

Divisions and departments are judged on the same performance, except that they are pitted, respectively, against other divisions and departments of the same plant in which they are located. As for the individual, each is judged by his over-all effort and the number of suggestions accepted.

All this may appear a bit simple, and especially when it is considered that the idea itself is no more than the recognition of a long-accepted principle. Yet to work it out in practical detail for an organization of 20,000 and then to sell it and keep it well sold to these 20,000 is a job of sizable dimensions.

That the task has not been even more formidable may be attributed to a well-established personnel relationship which provides for free exchange of ideas between management and employes; employe training and educational courses; a high-

Production

as much as 160 per cent

. . . . by combining a soundly conceived plan, based on competition, with a colorful and highly dramatized means for presenting and keeping it continually before the workers. Exceptionally efficient suggestion system results in 18 per cent of all suggestions submitted being adopted and rewarded

ly developed employe suggestion system; various organized social and athletic activities; and a regularly published company house organ, supplemented by special bulletins and addresses over plant communications systems by executives on developments of spot interest to the employes. These and other features all tended to build up a cordial and understanding relationship.

Then, too, upon the outbreak of war in Europe in September, 1939, long range plans were laid against the time when the country might be called upon to divert its facilities and manpower to war production, as has since come to pass. Only recently the last of its civilian phonograph-radio instruments was produced and presented with due ceremony to W. L. Batt Sr., director, Materials Division, War Production Board, who, in turn, presented it to the Warm Springs Foundation, Georgia.

From the first, the fine hand of advertising and enlightened personnel policy has been seen throughout. In fact, the whole program has been under the supervision of Thomas F. Joyce, vice president in charge of public relations and internal education, of whom it has been said it is difficult to determine whether he is an advertising man engaged in personnel work or a personnel man engaged in advertising. Certainly, whichever may be the case, he has blended the two well for he has employed advertising methods to sell increased production to employes, a thing he could not possibly have done without a keen insight into personnel relationships.

Organization followed weeks of careful planning, with a central committee set up in Camden and with similar campaign units set up at each of the company's other four plants—those in Harrison, N. J.; Bloomington, Ind.; Indianapolis, Ind.; and Hollywood, Calif. Advance interest was engendered by the mysterious use of the symbol: Dash, three dots; and behind the use of this particular symbol, incidentally, is the story of E. T. Jones, engineering products advertising manager and an old-time wireless operator, who noted that the reverse of the three dots and a dash of the "V" for Victory stood for "B" for "Beat the Promise".

Thus it was that in mid-August last year each employe received with his pay check a radiogram signed by G. K. Throckmorton, then president and now chairman of the executive committee, calling attention to this symbol as "something that has tremendous significance to the U.S.A., you and me. You and I will

Fig. 1—Departmental production chart is important in keeping workers informed as to their standing. "Ahead" or "Behind" strip is interchangeable; numbers are changeable; tug-of-war figures are on a strip which is movable to left or right underneath the marker. Lower messages can be changed

Fig. 2—"Squeegee" is one of cartoon characters created for the campaign. Here he is shown with his "little helpers"

Fig. 3—"Squeegee", the fifth columnist, points up some "dont's."

Fig. 4—"Squeegee" turns out to be a Jap

see it, hear it, strive for it and learn more about it soon."

Then shortly after, patriotic posters in full color containing only the large letter "B" with the code symbol —dash, three dots—were conspicuously placed in all plants of the company. Large signs appeared on sidewalks and outdoor bulletin boards for blocks around each plant. So-called "teaser" spots of 14 seconds each were bought on radio programs broadcast over local plant areas for community as well as employe interest was desired. Local newspapers carried small ads, and for several days in each plant vicinity factory whistles tooted off the dash, three dots signal, with those of neighboring as well as company plants joining in the spirit and the din. "B" stickers were placed on all inter-office correspondence and on all outgoing mail at all plants, and employes received "B" buttons.

Thus, by working on the curiosity of all, an enormous amount of initial interest was stimulated. Then three days before the inaugural rallies which were staged outside of each plant, the first edition of the *Beat-The-Promise News*, a semi-monthly campaign publication, was issued, outlining in general detail the new program and its purposes. And soon the race was on.

These inaugural rallies, it is worth noting, set a pattern for the many weekly rallies which have followed insofar as they were brief (only 15 minutes so as not to defeat the very purpose for which they were intended) and colorful, both figuratively and literally, with flags, bunting, bands, mass singing and other features to inspire enthusiasm.

On these programs have appeared many high ranking government and military officials and radio stars. Special features, such as athletic drills, dramatic demonstrations of various types of military equipment, merit awards by Army and Navy officials and other notables, flag raisings, and so forth, have all contributed to these affairs.

In addition to these rallies are formal plant inspections by Army and Navy officials, much campaign literature, and publicity of various descriptions—all designed to keep enthusiasm at the boiling point. There are regularly scheduled music periods during which plant sound systems play recordings of various martial airs and other music. Here mention may be made of two of the company's campaign songs: "RCA's Gonna Beat the Promise" sung to the tune of "Casey Jones," and "We're Gonna Have To Slap the Dirty Little Jap".

Excellent for their morale improvement has been the innovation of playing over the plant communication's loud-speaker system recordings of interviews with RCA men now in the service. For instance a typical interview greetings to the service man's friends in the plant, some details of his experiences with RCA products in the field, ending with the suggestion to watch all soldered joints for they depend on their communications equipment.

Originally a month's leeway between each campaign was planned for organizing and developing new features for the next. But now with the country in the thick of war, these interim periods are out for the duration. Rather, in a broad sense, the program will continue without break and with various changes in slogans, posters, buttons, campaign stunts, and so forth, as the occasion may require. The first major campaign was "Beat the Promise", which was then followed by one calling for all employes to "Put the Squeeze on the Japanese"—but by "beating the promise", a phrase that in one form or other will probably stick with the program.

The most coveted prize in each campaign is the president's flag, which is awarded each month to the plant that has done the best job in the preceding month. For the divisions and departments there are special symbols of recognition for top performance which are awarded each week. When a division or department is successful in retaining it for four times during a campaign, it keeps the award.

During the first campaign these symbols were large cut-outs of Uncle Sam extending congratulations. Later they were followed by large posters of Uncle Sam dressed for work, thanking the department for its help.

For the individual, merit decorations are given to all members of the department which succeeds in Beating the Promise for four weeks. In the first campaign, it was a bar decoration; and for each additional two weeks of top performance a star was added. Full honors (three stars) were won for such accomplishment for 10 out of the 13 weeks.

Incidentally, at the end an effort was made to recover all decorations, except from those who had won full honors. However, a 100 per cent recovery proved difficult—in fact, downright impossible. For instance, when an employe's young son had taken possession and was proudly wearing it to school, or when an employe had passed his "frat pin" along to his girl friend—well, there was simply nothing to be done.

As a matter of fact, the company found it couldn't get priorities on the type of metal used for the bar decoration, anyway, so for the next campaign chevron pins were used. There are three types of these chevron pins—one with a single

5

6

chevron for outstanding effort for the first three weeks, another with two for six weeks, and the third with three chevrons for nine weeks.

For the individual also there are suggestion awards, but more will be said about this important phase later. Suffice it to say for the moment that, based on a long-standing system, cash awards are made for all accepted suggestions for bettering manufacturing methods; material conservation; safety; and so forth.

In all major campaigns, office workers win their merit decorations by submitting suggestions. In the first drive, for instance, a $10 suggestion won the medal. Each $3 suggestion up to three earned a star for the medal, while a $20 suggestion or better won the complete decoration.

Then during these major campaigns, there are special merchandise awards over and above the cash awards, and usually some extra special incentive. This winter, Florida vacations were awarded to the ten hourly-rated employes and to the five salaried employes who submitted the best suggestions in their respective groups.

In April there was a special drive for over-all suggestions and for ideas on waste elimination. This drive got off to a good start with a series of rallies, including an Army Day rally at which a message was addressed to General MacArthur and another at which William L. Batt was the featured guest. Hence the April suggestion drive slogan—"Let's Go to 'Batt' for General MacArthur".

Yes, there is a let-up in the general fanfare, but at times it is hard to discern.

Among the more notable dramatizing effects used thus far was the character called Squeegee, "the worst fifth-columnist of them all". Behind his smiling mask and outstretched hand and draped in an American flag, he was portrayed as a dastardly little devil with a dagger behind his back, symbolizing waste, delay, carelessness and whatever else might be conceived of as interfering with an all-out effort—and judging from accomplishments at the RCA plants from the very first, his existence soon became one round of frustration.

He appeared in life-size cut-outs with appropriate blurb balloons such as "Why pamper any machine? If it breaks you can rest!"—"Work with me, pal! Let's waste, delay and be careless!"—"Shake, pal! Let's kill some time!"—"Sure, take a chance! Why bother asking!"—and various others. He was the subject of many company cartoons, with the series finally climaxed by the rogue's unmasking — and guess what! He was a Jap!

Then in scarcely no time at all things began to shape up—and the Jap was it. The "squeeze" slogan for the next campaign, the "Slap the Jap" song, Jap posters, Jap stickers, large Jap cut-outs, Jap cartoons and Jap stunts.

One fair day this spring a "Jap" parachutist was spotted by a low-flying plane on the roof of one of the RCA buildings in Camden—and was he "captured"? We'll say so—by a whole flock of RCA war workers, plus some soldiers who happened to be in the vicinity.

Perhaps the company could be pardoned for pointing to the effective use of plant sound communications not only in these campaigns but in the normal routine of its personnel relationships. For all mass gatherings, and for those of its employes who cannot attend because of their work, they are regarded as indispensible. For discussion of many important matters bearing on the economic status of the employes or major changes in official personnel or policy, to say nothing of pertinent spot news on campaign or more routine company matters, sound communications have proved invaluable. The company has long made it a policy to get to its employes as quickly as possible on many such questions so as to forestall gossip and rumors, which may distort the true facts and cause undue agitation or concern.

For instance in the early stages of changeover from civilian to war work, the sound communication system was used to fine advantage in reassuring employes and in preparing them for what lay ahead. Then there are various every day uses such as paging, music periods, and so forth. Incidentally, music periods are observed daily at RCA plants from 7 to 7:29 a.m., 12 to

(*Please turn to Page* 80)

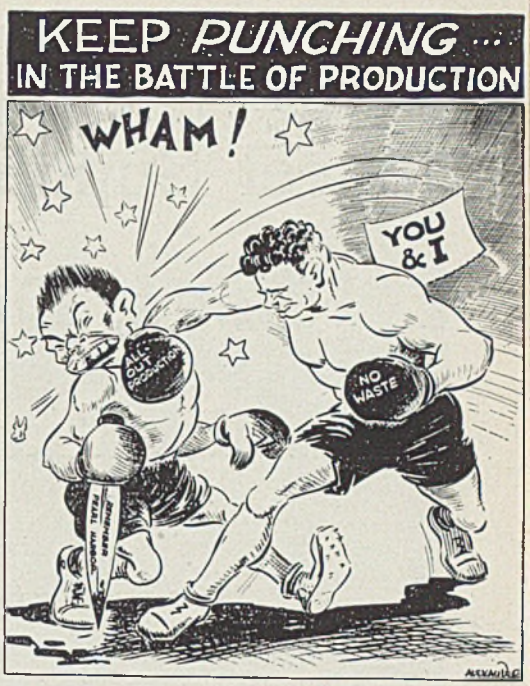


Fig. 5—Cutout of Uncle Sam extending congratulations is presented to winning department by company official—and do the workers like it?

Fig. 6—This striking "Don't Be A Bottleneck" poster really gets workers' attention

Fig. 7—Top, action posters like these serve to focus workers' attention on the battle of production. Many different posters are used and their location continually changed to keep them working most effectively. Center, conservation of materials is another topic that receives effective poster treatment at RCA

Fig. 8—One of many effective posters that get the workmen interested in submitting suggestions for improving production

Steel Supplies Adequate for All War Needs, Declares Tower; Overall Allocation Unwise, Says Adams

Nation now has twice steelmaking strength of its enemies, Institute president points out; Retiring WPB steel chief analyzes Washington proposal to allocate all products

NEW YORK

OVERALL allocation of iron and steel products would be both unwise and impractical, C. E. Adams, retiring chief of the WPB Iron and Steel Branch, told 800 members attending the fifty-first general meeting of the American Iron and Steel Institute at the Waldorf-Astoria, here, May 21.

Mr. Adams pointed out that steel products are made in thousands of sizes, shapes and specifications in hundreds of mills, most of which have differing size and quality range.

Effective administration of a complete allocation program would require the services of a much larger and experienced staff

This personnel could be obtained only from the industry itself because it would be impossible to train men for the work within any reasonable time. The industry already is suffering from conscription of manpower and further deletion of experienced men would have ill effects on production and efficiency and would defeat the very purposes of the program.

Mr. Adams said one of the major faults of the priorities program has been that ratings have been granted on a basis of delivery desired rather than on the basis of importance of the end product and the end use.

His experience as chief of the branch, Mr. Adams said, has proved to him that the majority of constructive ideas regarding steel production and distribution have come from members of the industry, "who are sufficiently detached from vertical chart responsibilities to distinguish the forest from the trees."

Walter S. Tower, institute president, said that in spite of the cry "not enough steel" it is not possible that there can be any actual shortage of supply for the war program. As a matter of fact, he continued, there are indications that ability to make steel for war purposes will be in excess of the ability of fabricating industries to convert steel products into ships, aircraft, guns, tanks, trucks, projectiles and other war materials.

Rationing and scant supplies will of course be accepted, in steel as in other materials, if they are necessary and imposed by war conditions. In too many cases, Mr. Tower pointed out, no explanation of such necessity has been given or appears to be forthcoming.

No Inflation in Steel Prices

"If the present elaborate system of priorities were operating effectively, an order relating to these 400 items (M-126) would not be necessary. If the system is not effective, no such order offers any adequate remedy."

Mr. Tower praised the steelmakers for their part in producing great quantities of war materials in the face of adverse circumstances.

"In spite of higher and rigid costs of production, steelmakers have turned another year without any general increase in prices of their products. While the average level of wholesale prices has risen 30 per cent since September, 1939, the composite of steel prices is up less than 1 per cent. There has been no contribution to inflation here. It would be fortunate, indeed, if the same could be said for farm prices and for wages . . .

"In gearing its plants and activities to war conditions your industry has written another brilliant chapter in a long record of achievement. It is an accomplishment of which you may well be proud.

"In looking at what has been done during the year it is natural to inquire how performance here compares with possibilities in the enemy countries. The United States alone has been producing recently, each month, about as much steel as Japan probably is able to produce in a year. Your industry can make every six days as much as Italy can make in six months, and it is producing at nearly three times the probable rate of all the European industry which is under German control or is available to Germany. To put it another way, the United States alone has double the critical material strength, measured in tons of steel, that is now prssessed by all enemy countries.

"As you all know, a steady expansion of facilities has been the normal thing in the steel industry of this country. It added 20 million tons between 1919 and 1940, and a further seven millions since the defense program began two years ago. An accelerated program of expansion, embracing both blast furnaces and steelmaking, can lift our rate of output, if metallics are available, by about 10 per cent before the end of next year. At the same time, it seems probable that the steelmaking abilities of the enemy countries have been shrinking rather than expanding, because of deterioration of equipment, difficulty of obtaining essential materials, inefficiencies of transportation and progressive wasting of manpower.

"As a result of this record of outstanding achievement, the steel

DIRECTORS of the American Iron and Steel Institute at the institute's fifty-first general meeting in New York, May 21

industry is now fully on a war basis. Steelmakers know the intimate dependence of war effort on steel supply. Their immediate concern is to do everything which will add to that supply and the war effort.

"The industry now finds itself consistently able to make about seven million tons of steel per month. Still, from some quarters there is a constant cry of 'not enough steel.' There are those who berate the industry at every turn, evidently in the belief that such is the way to find more than 168 hours in the week or more than 2000 pounds in a ton of steel."

Shortage of raw materials, especially scrap and ore, likely will place a ceiling over increased production for some time to come, Mr. Tower said.

"The industry began this year with a rated capacity of approximately 88½ million tons. Production to the end of April, just above 28,000,000 tons, was still short of matching that capacity, in spite of all efforts to squeeze out every last ton. As many in the industry know from actual experience, it is possible, over sustained periods of time, for steel furnaces to exceed rated capacity by a margin of 2 or 3 per cent. But until larger supplies of metallics, iron ore and scrap, can be had, it is doubtful whether recourse to all possibilities will suffice to keep steel tonnage up to the rate prevailing so far this year, or a total of 85,000,000 tons for all of 1942.

"The first step to assure a larger supply of metallics is the approved program for construction of blast furnaces. As it is planned, that program will add approximately 26 furnaces as and when completed. Several of those furnaces should be producing pig iron in the latter part of this year, if all goes well.

Priorities Hinder Expansion

"Lately all has not been going well. Too many priorities for other uses rank above those on materials and equipment for blast furnaces. Thus the steel industry is left dangling between official insistence that it expand and official regulations that hamper construction. There is also an open question whether the first few of the furnaces to be completed will add to the total steelmaking materials available, or merely serve to balance an expected shrinkage in supplies of scrap.

"If and when the blast furnace program is finished, it is assumed that there will be enough steelmaking iron available to support an annual output at the rate of approximately 92 to 94 million tons of ingots. According to present prospects, those figures are not likely to be reached before the middle of 1944.

"Under the circumstances, a steel expansion program, planned to add some 10 million tons of ingot capacity, has little chance of making any early contribution to steel supply for war uses. In fact, it already seems doubtful whether that program will be completed.

"The facts suggest, therefore, that the war effort over the balance of this year and well into 1943 will have little, if any, more than the current volume of steel output. This war can be fought and won with the steel which you can now make, if it is wisely apportioned according to actual need. Indeed, there are some in the industry who question whether all the available steel will be used, unless some of the present limitations on consumption are relaxed.

"Steel for war plants and for their products has helped to make real the seemingly impossible. Production of war materials is generally known to be approaching almost unbelievable volume. In fact, except for ships, so much may presently be coming off the various production lines as to be embarrassing, unless some better ways of disposal are found than now are in sight."

Shipments of plates to government agencies alone exceeded 500,000 tons in March, more than was shipped to all consumers last year, Mr. Tower said. April and May figures were much higher and June will be a full 50 per cent above March.

"Your industry is now making nearly twice the tonnage of plates that all the rest of the world can

roll. Your plate figure next month is likely to be a million tons.

"Lately, plates have been going to the shipyards at a rate sufficient to make much more tonnage of ships than the current schedule includes. Shipyard stocks of unfabricated plates are known to be substantial.

To resist the forces of wartime inflation, Mr. Tower declared, the steelmaker is hardly a free agent. Production schedules to a growing degree are prescribed. Prices lie under a ceiling, which may sag, but seemingly cannot be lifted. Wages face the rulings of a board that moves only upward.

The steelmaker can, however, point out the consequences of such policies. He can insist that unless wages are stabilized, control of steel prices, and all other prices, will be futile—"as futile as a youth with a mouth full of crackers trying to whistle while heading into a high wind."

"The problem of preserving an industry where men may be free to work ought not to arise in a country founded to escape persecution, long dedicated to democracy, and recently embarked on a titanic effort to preserve liberty. Tribute exacted for the privilege to work is still persecution. In the minds of many managements there must be grave misgivings as they ponder the possible consequences of decisions which they face. Must they be party to a guarantee of financial security for certain labor organizations, by levies from the pay checks of their employes, at the very time when a host of small businesses and millions of men are called upon for heavy financial sacrifice? Is the tyranny of words under which we now live too great to resist?

"As and when the country comes out of this war victorious, the number and the magnitude of the problems which will have to be faced are perhaps beyond present accurate measurement or comprehension. We still do not know whether in winning this war we may not lose those liberties for which we believe the war is being fought. We do not know what will be government attitude toward relaxation of wartime regulations and rigidities. We can not fully appraise the changes at work in fundamental relations between labor and management."

Mr. Tower asserted that with frozen costs and inflation taxes, a decline in steel prices or in the volume of production when the war ends could quickly bring acute trouble to the industry.

He then pointed out that the industry after the war will find itself equipped with facilities and capacities for which there will be little, if any, use, and that steel will be facing competition from the lighter metals, aluminum and magnesium, and from plastics, plywood and other materials nutured by the war.

"Yet in spite of all new competitive elements, it seems inevitable that the basic industry will continue to be steel."

Mr. Tower was re-elected president of the institute as were all other officers. These include: B. F. Fairless, president, United States Steel Corp. and Frank Purnell, president, Youngstown Sheet & Tube Co., as vice presidents; Harold L. Hughes, vice president, U. S. Steel, treasurer; and George S. Rose, secretary. J. H. Parker, president, Carpenter Steel Co., Reading, Pa., was elected a director.

Bessemer Medal Presented to E. G. Grace by British Steel Institute

E. G. Grace, president, Bethlehem Steel Co., was awarded the Bessemer Medal, outstanding award in the international field of industry, by the Iron and Steel Institute of Great Britain. Presentation was made by Ian F. L. Elliot, left, a member of the council of the British institute, at the fifty-first meeting of the American Iron and Steel Institute.

In presenting the award to Mr. Grace, Mr. Elliot said: "In the world of steel, the Bessemer Medal needs no introduction. In the whole field of science and industry, it is prized as the supreme recognition of the achievements by which men, in their time, can contribute to human progress.

"Our institute has accorded to the most distinguished representative of your great industry the highest honor, which lies within its power to bestow, in recognition especially of his outstanding achievements in the world of steel, but also of the sure and powerful support, which the steel industry of America has given to the British industry in its time of need."

In accepting the Medal, Mr. Grace remarked: "It would be ungenerous on my part not to recognize that the services attributed to me in the British institute's citation reflect both the teamwork of my associates in the Bethlehem Steel Co. and of the American steel industry as a whole in doing our utmost for the cause of victory.

"Good as our performance has been, it is not enough to win the victory. We must quicken our pace. At all times, the various companies in the American steel industry must unselfishly and wholeheartedly serve our government and our allies without regard to competitive rivalries or to anything but the job of maximum production to win the war as soon as possible."

At the same time, Walter S. Tower, president of the American institute, was presented a diploma of honorary membership in the British institute.

H. W. Johnson, assistant superintendent, Inland Steel Co., Chicago, was awarded the American Iron and Steel Institute medal for best technical paper not already honored.

War Plant Expansion To Be Curtailed; Emphasis Placed on "Production Now"

WASHINGTON

EXPANSION phase of the war production program soon will draw to a close, decisions made by WPB officials within the past few days indicate. Emphasis now will be placed on the production that can be obtained in the remainder of 1942 and early 1943.

Projects that originally were scheduled for initial output early in 1944 probably will be abandoned. In fact, WPB officials mention July, 1943, as the deadline for completion of new war production plants.

Some curtailment in the 10,000,000-ton steel expansion program is considered certain, although WPB officials will not say how much. Many of the units already are well under way and will not be affected by reversal in policy. In other cases, however, ground either has not been broken, or at least work has not progressed far.

The WPB Planning Board under direction of Robert Nathan, chairman, has been conducting a survey to determine how much material could be conserved for immediate war production if projected expansion programs were halted, and he has made a tentative report to Donald M. Nelson.

Basis for the proposed curtailment is shortage of raw materials and the need for direct war materials now. The steel industry, for example, has had difficulty in obtaining enough raw materials to operate at its present capacity for months. While war demands for steel are said by WPB to be greater than the supply, the question has arisen as to the wisdom of diverting tonnage needed for direct war materials to building new plants for which raw materials possibly could not be obtained.

War's Length Clouds Issue

Most difficult question confronting the war production agencies in deciding how much expansion shall be made is that of forecasting the length of the war. If the war is to be short, obviously the best policy will be to throw all available materials into direct war production now. If the war is to be prolonged, expansion of plants should be continued to assure long-term superiority in capacity to produce the materials of war.

That the problem of materials shortages and the allocations of the materials available is complex was stressed by Mr. Nelson last week.

"There is a multiplicity of uses for all the metals," the WPB chieftain said before the National Institute of Social Sciences in New York. "You need a given metal, let us say, to make certain direct military items. You also need that metal to make some of the machinery with which other military items are made. You need it, furthermore, to build the plants with which still other military items are made; you may need it in order to produce some other raw material which is equally vital to successful prosecution of the war.

"Thus you have a whole set of conflicting demands for your metal. Above a certain level, all of them are equally important. You can't possibly meet all of them. There develops, therefore, an extremely difficult problem of balance. The necessity of making sure that comparative needs are adjudged properly and that the program as a whole is rightly proportioned.

"For these reasons, no part of the war production program stands by itself. Your ability to produce synthetic rubber, for instance, may be limited by such a seemingly unrelated factor as the necessity for building a big tonnage in merchant shipping, because of the steel plate needed for boats. The size of our ammunition program will have a direct effect on the quantity of copper which has to be made available to the various power plants—which, in turn, may in part depend on the shipping situation along the West coast of South America.

"To add to all of these complexities there is the pressure of time.

"Of all the shortages we face, the shortage of time is the most

Steelworkers Meet National Hero in Tube Mill

CAPT. Hewitt T. Wheless, bomber pilot cited for heroism by President Roosevelt, has been visiting industries throughout the country to encourage armament production. Here he is shaking hands, last week, with workers at National Tube Co.'s Christy Park plant, McKeesport, Pa.

serious. It is comparatively easy to figure out how this complex production program can move forward to the desired goal *eventually*—but our Army and Navy are in action *today*, and we know that it will do no good whatever to turn out a flood of goods a year from now if we do not have adequate equipment and supplies for the emergencies that are certain to arise this year. We have to meet tomorrow's requirements as well as next year's. Or, to put it in another way, we have to have both a short-range and a long-range goal, and proceed toward both of them simultaneously. We could make practically unlimited plans for production in 1944, if we did not have to produce large volumes of goods in what remains of 1942. The problem of how to get the best use out of the material at hand is forever complicated by the accompanying problem of *when* it is to be used.

"From this point on, the crux of the war production program will be this unending struggle with the problem of time and material."

REVISIONS AND ADDITIONS TO PRIORITIES – ALLOCATIONS – PRICES

as published in Section Two of STEEL, April 20, 1942

"M" ORDERS

M-9-c (Amendment): **Copper**, effective May 15. Permits person having frozen brass mill or wire mill products to sell them to any brass or wire mill without WPB approval. Sales previously limited to originating mill. Places locks on list A-1, permitting manufacture until May 31.

M-21-c (Amended): **Tin Plate and Terne Plate**, effective May 16. Limits use for cans and closures, as authorized by M-81 and M-104; for baking pans for institutions and commercial bakers, hot dipped tin plate up to 1.25 lbs. per base box and electrolytic plate up to .50 lbs.; for dairy equipment, hot dipped tin plate up to 3.30 lbs.; for cheese vats, dipped plate up to 11 lbs. per base box; for gas meters, dipped plate up to 3.3 lbs., electrolytic up to .50, short ternes up to 1.30, long ternes up to 4 lbs.; for oil lanterns, short ternes up to 1.3, long ternes to 4; for textile spinning cylinders and card screens, dipped plate up to 1.25 lbs. Persons with frozen stocks required to list holdings with WPB for purchase and distribution.

M-40 (Amended): **Sperm Oil**, effective May 16. Establishes complete allocation control. Users file PD-481 monthly to request delivery. Sperm oil with sulphur content less than 10% banned in making lubricating or cutting oils or compounds.

M-66 (Amended): **Cashew Nut Shell Oil**, effective May 14. Bans use in making brake linings, except for Army and Navy. May be used to fill orders rated A-2 or higher if oil comes from inventory.

M-145: Cocoa, effective May 11. Restricts processing of cocoa beans.

M-148 (Amendment): **Exports of Critical Material**, effective May 15. Removes farm equipment from list of materials given preferential treatment on export to Latin America. This now covered by amendment to L-26.

M-149: Phosphate Rock, effective May 11. Removes minimum working inventory restrictions to permit stock acquisitions.

M-153: Acrylonitrile, effective May 14. Establishes complete allocation. Applications for deliveries made monthly.

"P" ORDERS

P-56 (Amendment): **Mines**, effective May 15. Removes reference to gold and silver mines. Such mines previously denied high ratings for machinery and equipment, but Director of Industry Operations must approve all requests for these ratings.

P-74 (Extension): **Heat Treating Furnaces**, issued May 11. Extends order to June 30, after which date holders of ratings must qualify under Production Requirements Plan.

P-79 (Amendment): **Non-metal Containers**, effective May 16. Rating for deliveries of ferrous material to be used in such containers advanced from A-7 to A-1-c.

P-90: Production Requirements Plan. Form PD-25X used by firms with annual business of less than $100,000 yearly to be discontinued after May 23. Simplified PD-25A to be used instead.

P-106 (Amendment): **Copper and Brass Mill Maintenance**, effective May 14. Grants suppliers of maintenance and repair materials A-1-c rating to replenish inventories. Former rating was A-3.

"L" ORDERS

L-26 (Amendment): **Farm Machinery, Equipment**, effective May 18. Raises export quotas from 80% of 1940 volume to 112% for all countries except Canada. Separate quotas established for various items on exports to Canada. L-26-b, effective May 16, provides for disposition of iron or steel in excess of requirements. Alloy steel on orders rated A-1-k or higher may be sold to Defense Supplies Corp., Metals Reserve Co., to a mill for reprocessing or resale, or upon authorization of Director of Industry Operations after application filed on PD-479. Other iron or steel may be sold on orders rated A-3 or higher.

L-38: Air Conditioning, Commercial Refrigeration, effective May 15. Prohibits installations of new equipment except for Army, Navy, Maritime Commission, certain other government agencies, Lend-Lease and on orders rated A-9 or higher issued for specific type of equipment. Subsequent manufacturing limited to number of items delivered on preferred orders in preceding period or to number of unfilled orders. Manufacture of beverage dispensers and coolers, room coolers, soda fountains, quick-freeze refrigerators permitted for 90 days only for Army, Navy and Maritime Commission.

L-41 (Amended): **Construction**, effective May 16. Changes term "defense housing" to "war housing." War housing for which preference rating orders of P-55 series are issued is exempt from provisions of L-41.

L-51: Anti-Freeze, effective May 14. Places production on quota basis. Quotas, to be fixed later, expected to approximate 50% of amount sold in 1941.

L-62 (Amendment): **Metal Household Furniture**, effective May 14. Permits use of iron and steel contained in inventories prior to March 20, provided parts are so processed as to be worthless for other purposes. Permits production of Venetian blinds containing less than 15 ounces of metal per blind. General deadline for stopping metal furniture manufacture extended from May 31 to June 30.

L-83 (Amended): **Industrial Machinery**, effective May 18. Extends restrictions to dairy, coffee grinding, and food slicing and grinding machinery. Permits production of new machinery for stock without authorization.

L-103: Glass Containers, effective May 11. Provides for simplified practices prohibiting manufacture of glass containers not conforming to specified standards. With a few exceptions, all glass container designs must be held to existing molds.

L-117: Heavy Power & Steam Equipment, effective May 18. Limits sales and deliveries to government and Lend-Lease orders, to orders rated A-9 or higher assigned by PD-3 or 3A certificates countersigned prior to May 18, or by PD-1 or 1A or P-19h order issued at any time.

L-121: Construction Lumber, effective May 13. Freezes for 60 days all sales and deliveries by large producers of softwood "construction" lumber, except to meet needs of Army, Navy and Maritime Commission.

PRICE SCHEDULES

No. 136 (Amendment)—**Machines and Parts**, issued May 14. Postpones effective date from May 18 to June 1, 1942.

No. 141—Shearlings, effective May 13.

No. 142—Summer Seasonal Commodities, effective May 18. Provides method for determining retail ceiling prices on summer merchandise.

No. 143—Tires and Tubes (Wholesale), effective May 18. Establishes maximum prices at levels previously applied under voluntary agreement with OPA.

No. 144—Insecticides and Fungicides, effective May 18. Provides method for determining retail ceiling prices.

No. 145 — Pickled Sheepskins, effective May 23.

No. 146—Appalachian Hardwood, effective May 19 and June 1.

No. 147—Bolts and Nuts, effective May 28, 1942. Sets maximum prices for bolts, nuts, screws and rivets at Oct. 1, 1941 levels; for cap and set screws at June 1, 1941 levels.

For additional revisions and additions please see STEEL of April 27, p. 30, May 4, p. 46, May 11, p. 55, May 18, p. 46.

R. L. Coe Heads Copper, Brass Research Group

Robert L. Coe, vice president, Chase Brass & Copper Co., Waterbury, Conn., was elected president of the Copper and Brass Research Association at its twenty-second annual meeting, May 22, in Hotel Biltmore, New York. He succeeds

John A. Coe, president, American Brass Co., Waterbury, Conn.

Others elected: Vice presidents, John A. Coe; Wylie Brown, president, Phelps Dodge Copper Products Corp.; R. E. Day, president, Bridgeport Brass Co.; W. M. Goss, vice president, Scoville Mfg. Co.; and C. L. Smith, treasurer, National Copper & Smelting Co.; treasurer, C. D. Dallas, president, Revere Copper & Brass Inc.; manager, T. E. Veltford; secretary, Bertram B. Caddle.

Inland Steel Co. Develops New Michigan Ore Mine

First big iron ore operation to be started since war was declared opened officially at Iron River, Mich., by Inland Steel Co. with a dedication, Friday, May 29. Ore had been struck at the 400-foot level.

Known as the Sherwood mine, Inland's new source of raw materials for its blast furnaces at Indiana Harbor is the fifth producing property in the Lake Superior region of which Inland is sole operator. It is located a mile and a half north of Iron River in the Menominee range.

Carnegie To Triple Tank Armor Output

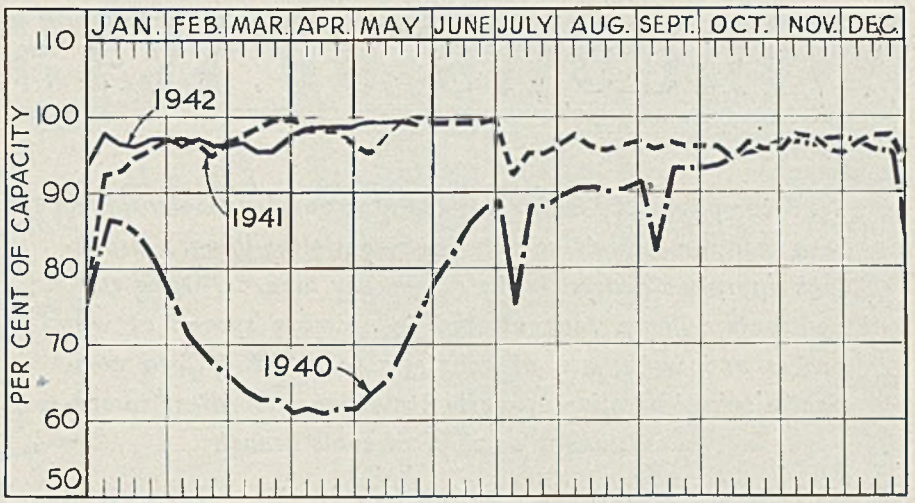
Carnegie-Illinois Steel Corp., Pittsburgh, will complete its tank armor plate expansion program by the end of this year, tripling present capacity for this product, J. L. Perry, president, said last week.

The facilities, centered in a plant that was operated as a tin mill from 1901 to 1940, cost $5,000,000. Equipment installed includes: Ten 15 x 40-foot heat treating furnaces; three 17 x 48-foot plate quenching tanks; two abrasive plate cleaners; two roller leveler units; 18 flame cutting machines; 31 flame softening machines; 31 brake presses (mechanical flattening presses); 13 electric overhead traveling cranes; 15 floor operated cranes; and other miscellaneous equipment.

Each tank armor set produced by the plant consists of more than 30 individual pieces of fabricated armor plate, which when assembled at the tank arsenal, form the body of the tank.

Breaks 81 Production Records

American Steel & Wire Co., U. S. Steel subsidiary, reports its plants broke 81 more production records during April. These records were on top of 68 records broken in March, and made a total of 252 new high marks established in the first four months of 1942.



PRODUCTION . . . . Down

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week declined ½-point to 99 per cent. Five districts showed lower rates, three advanced and four were unchanged. The rate a year was 100 per cent; two years ago it was 75 per cent, both based on capacity as of those dates.

Youngstown, O.—For the fifth week operations held at 94 per cent with 74 of the district's 83 open hearths in production and all three bessemer converters.

Central eastern seaboard—Gained 1 point to 96 per cent on freer flow of scrap.

Chicago—Dropped 1 point to 104 per cent because of repairs. Only one of six plants was below 100 per cent.

Detroit—Receded 3 points to 93 per cent though one producer continued at capacity.

St. Louis—Addition of an open hearth each by two interests increased production 4½ points to 98 per cent, the highest rate since the middle of November.

Buffalo—Continued at 90½ per cent, pending completion of furnace repairs, with 39 of 43 furnaces in production.

Cincinnati—Completion of furnace repairs caused a rise of 4½ points to 91½ per cent, with scrap supply adequate.

Birmingham, Ala.—Unchanged at 95 per cent, 23 open hearths being in production.

Cleveland—Declined 3 points to 91½ per cent as one interest was forced to shut down some equipment for repairs.

New England—For the second week production held at 100 per cent.

Pittsburgh—Reduction of availpig iron supply caused steelmaking to drop 2 points to 94 per cent.

Wheeling—Open-hearth repairs cut production 3½ points to 78 per cent.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended May 23	Change	Same week 1941	Same week 1940
Pittsburgh	94	— 2	100.5	73.5
Chicago	104	— 1	102.5	75
Eastern Pa.	96	+ 1	96	67
Youngstown	94	None	97	57
Wheeling	78	— 3.5	89	85
Cleveland	91.5	— 3	96.5	78
Buffalo	90.5	None	93	65
Birmingham	95	None	95	83
New England	100	None	90	56
Cincinnati	91.5	+ 4.5	89	61
St. Louis	98	+ 4.5	98	55
Detroit	93	— 3	89	79
Average	99	— 0.5	*100	*75

*Computed on basis of steelmaking capacity as of those dates.

Bethlehem Orders Ten New Reheating Furnaces

Ten large continuous slab and billet reheating furnaces will be designed and constructed for Bethlehem Steel Co. by the Rust Furnace Co., Pittsburgh. The furnaces, additions to present capacity, will be installed in West Coast and Maryland plants. Contract value exceeds $1,000,000.

Blaw-Knox Co., Pittsburgh, reports production volume for April was the largest in its history, exceeding by over 15 per cent the previous month. Results for the first four months likewise exceeded any similar period, almost entirely war materials, contributed by company's seven plants.

Windows of WASHINGTON

WPB compliance branch examines new construction to make sure scarce materials go only for essential building. . .Brookings appraises prospects for democracy here. . ."Open end" contracts will be renegotiated to promote spread of war orders and wider use of country's facilities. . .Two companies seized by alien property custodian. . .Stedfast to succeed Dunbar as chief of tools branch

By L. M. LAMM
Washington Editor, STEEEL

WASHINGTON

NATION-WIDE survey of all construction started since April 9, effective date of Conservation Order L-41, has been inaugurated by the Compliance Branch, WPB, announced.

Home Owners' Loan Corp. is lending the services of approxiately 3000 of its examiners for a detailed check on the degree of observance of the terms of the conservation order, issued last month to assure use of scarce materials only in essential building operations.

Reports of the HOLC examiners will be reviewed by the Compliance Branch, and appropriate action will be taken in cases of violation of priorities procedures or the provisions of L-41.

This operation is in addition to the compliance survey of the transactions of builders engaged in construction of privately-financed war housing projects, currently being made for WPB by some 200 inspectors loaned by the Wage and Hour Division of the Department of Labor.

Other compliance surveys announced today by the WPB include operations of silverware manufacturers, who normally use considerable quantities of copper, and inventories and uses of jewel bearings. The field investigations for both will be carried out by attorney-examiners of the Federal Trade Commission, on behalf of WPB.

Favorable and Unfavorable Factors for Democracy

Prospects for democracy in the United States are appraised in the light of evolution and experience, with particular reference to recent political, social and economic trends, in a study made public last week by Brookings Institution, Washington. The study, by Dr. Arthur C. Millspaugh, is entitled "Democracy, Efficiency and Stability."

The nation has numerous sources of encouragement and strength in its attempt to retain and extend democratic rule. Attention is called to its resources, recent revival of interest in democracy, ability to resist external agression, potentialities of a vast educational plant, prestige of science in this country, excellence of sources of public information, decrease of political corruption, freedom of elections, and other factors.

On the other hand, certain un favorable factors have made realization of efficient democracy more difficult. Among those emphasized are: Expanding functions and power of government, with increasing popular faith in and dependence upon governmental control; national centralization; growth of presidential power; declining prestige of legislative bodies; shifting of interest from democracy and political reform to concepts of efficiency and social justice; opportunity presented for governmental management of opinion; activities of pressure groups serving special interests rather than general welfare; and of acute interest at the present time, the burden placed on democratic government by international disorganization and war.

Renegotiation of "Open-End" Type Contracts Ordered

To promote spread of orders, speed in delivery and wider use of existing facilities, the WPB has issued Directive No. 3, providing for the renegotiation of government contracts of the "open-end" type used in peacetime.

These contracts require a government agency to purchase all of its requirements of a specified article from one company over a definite period of time.

In some cases, wartime needs for articles which the government has agreed to purchase from one company under an "open-end" contract far exceed the amounts contemplated when the contracts were originally signed. and participation of other companies is desirable both to obtain faster delivery and to use facilities of smaller companies which otherwise go unused.

Most of these contracts have been entered into by Treasury Procurement. Contracts of the War Department, Navy Department, Maritime Commission, or any government corporation are excluded from the terms of the directive.

Property of Two Companies Seized by U. S. Government

Alien property custodian last week announced the seizure by the United States of the assets, including steel holdings, of the Steel Union Inc., a California corporation acting for German steel companies, and control of the American Bosch Corp., Springfield, Mass. It was emphasized the latter action implied no criticism of the management or directorate of American Bosch which has "made an excellent record in the war effort."

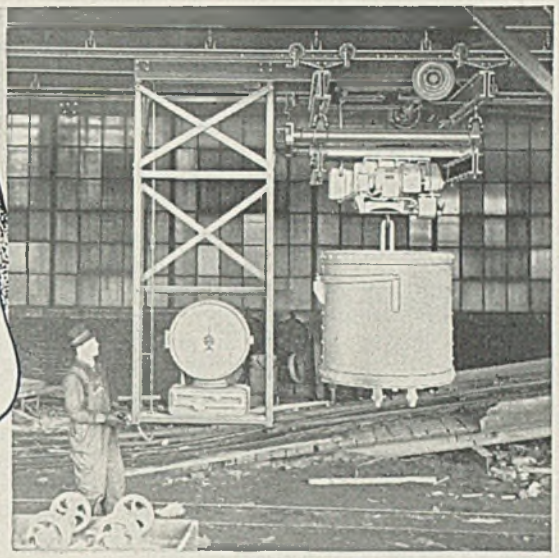
Dunbar To Resign Position With WPB Tools Branch

Howard W. Dunbar, technical chief of the WPB Tools Branch, is expected to resign soon, and will be succeeded by A. M. Stedfast, assistant chief of the branch. Mr. Dunbar is vice president and general manager of Norton Co.'s machine division, and a former president of the National Machine Tool Builders' Association.

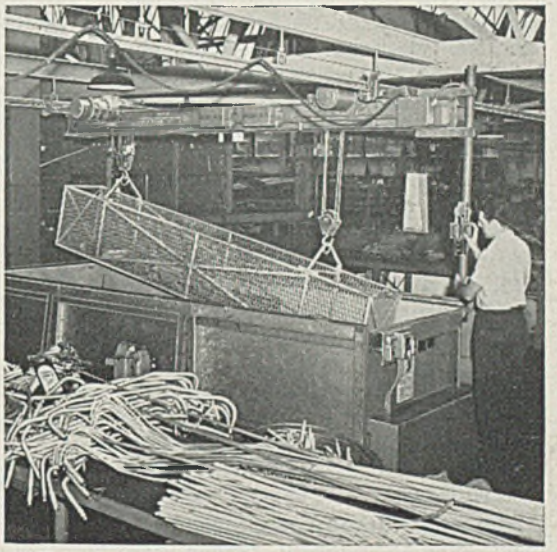
C. M. Wilcox, Washington, has been named chief of a newly created Plumbing Section of the Plumbing and Heating Branch.

A. S. Shafter, secretary-treasurer,

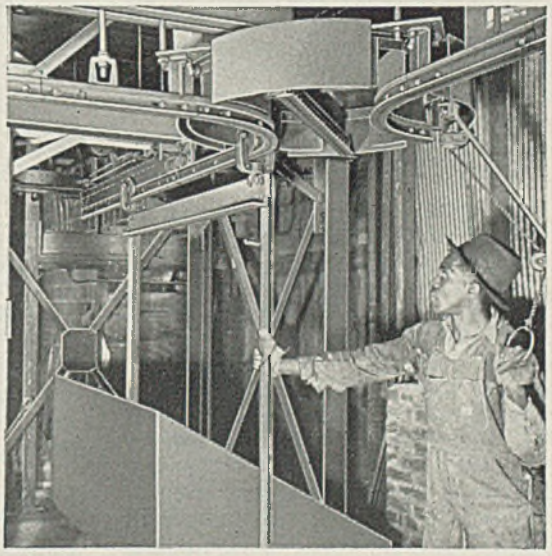
You Can Accelerate Your Rate of Production as Rapidly as You Release Man Power from Handling Labor



Power operated charging crane with built in scale and electric hoist.



Twin hoists, mounted on special crane, provide cleaning operation for metal tube parts.



Special rotary switch with charge carrier rolling on elevator to charging floor.

THE battle of production, too, can be won in the air. That is, on overhead handling equipment.

American MonoRail Equipment will increase your production and afford a substantial saving in your handling problems.

You can accelerate your rate of production as rapidly as you release man power from handling labor—illustrations show how this can be done with American MonoRail Equipment.

Let an American MonoRail Engineer explain many other advantages of overhead handling equipment. Regardless of size of installations, from the simplest to the most complicated, our engineers can help solve your handling problem. This service is without cost or obligation. There is no delay or shut-down during installation. Write today.

Write for Blue Book illustrating hundreds of MonoRail installations.

THE AMERICAN MONORAIL CO.

13102 ATHENS AVENUE ★ CLEVELAND, OHIO

United States Mfg. Co., Decatur, Ill., has been appointed special assistant to Philip D. Reed, chief, WPB Bureau of Industry Branches.

Primary War Contracts More Widely Distributed

Primary war contracts are now spread somewhat more broadly among contractors than was the case in the months before Pearl Harbor. This is shown in an analysis of supply contracts of $50,000 or more held by 100 corporations to whom the largest volume of contracts has been awarded.

As of Sept. 30, 1941, these 100 companies held approximately 82 per cent of the dollar volume of supply contracts of $50,000 or more let by the War and Navy departments and the Maritime Commission since June, 1940. Feb. 30, 1942, the 100 companies holding the greatest volume of supply contracts had about 76 per cent of the business awarded since June, 1940.

Comparable figures as of May 31, 1941, are not available for 100 companies, but comparisons have been made for 60 companies. At the end of May, 1941, September, 1941, and February, 1942, respectively, the percentage of Army, Navy and Maritime Commission war supply contracts of $50,000 or more held by 60 top companies were approximately 75 per cent, 76 per cent and 69 per cent. These figures indicate a broader distribution of business.

The top three companies, however, held a slightly larger proportion of supply contracts at the end of February, 1942, than at the end of September, 1941, although not quite as large a proportion as at the end of May, 1941.

Used Construction Machinery Section Established in WPB

Establishment of a Used Construction Machinery Section in the Construction Machinery Branch of the Division of Industry Operations was announced last week by Joseph F. Ryan, branch chief.

Hamilton O. Penn, former president of the H. O. Penn Machine Co., New York, has been named head of the new section, which will survey the used construction equipment situation throughout the country and work out plans under which all available machinery can be put to use.

Substitutes for Steel in Containers Urged by WPB

Users of metal containers have been warned by the WPB Containers Branch that an urgently critical situation exists in steel, and that immediate and extensive use of substitutes for steel containers, particularly drums, must be undertaken.

Even though substitute materials may be more expensive and less satisfactory, their use may be the means of keeping such companies in business. Substitution of materials not needed in war production should be used wherever possible, but even critical materials which are less critical than steel can be used where necessary.

The Containers Branch pointed out that it is possible that steel container users may soon be forced to suspend operations until they are able to develop suitable containers which do not use steel.

Nails, Wire for Food Boxes Assigned A-1-c Rating

To speed the manufacture of nonmetal containers to be used for food products, the WPB has assigned a rating of A-1-c for deliveries of ferrous material to be used in such containers.

Manufacturers of nonmetal food containers formerly had an A-7 rating, which proved too low to obtain necessary nails and wire.

Without the high rating granted by the amendment, boxes, hampers, and crates, necessary for harvesting of many vitally-needed crops, could not be built.

Use of Tin, Terne Plate Limited to Specific Items

Use of tin and terne plate, except by special authorization, was limited to a few specific items by WPB in a revision of Supplementary Order M-21-e. The permitted uses are:

For cans, as authorized by Conservation Order M-81.

Closures, as authorized by Conservation Order M-104.

Baking pans for institutions and commercial bakers, hot-dipped tin plate up to 1.25 pounds per base box and electrolytic plate up to .50 pounds.

Dairy equipment, hot-dipped tin plate up to 3.30 pounds per base box.

Cheese vats, dipped plate up to 11 pounds per base box.

Gas meters, dipped plate up to 3.30 pounds, electrolytic up to .50, short ternes up to 1.30 and long ternes to 4 pounds.

Oil lanterns, short ternes and long ternes with the same coating limits.

Textile spinning cylinders and card screens, dipped plate of the basic 1.25 limitation.

All other uses, except for Army, Navy and Maritime Commission contracts, are stopped.

All possessors of stocks of tin or terne plate frozen by the order are required to file immediately with the WPB an itemized list of their holdings so the material may be purchased from them and channeled into war production.

Sale of Small Quantities of Relaying Rail Permitted

WPB has relaxed its control over shipments of relay railroad rail, reroll and scrap rail so that small quantities of used rail may be disposed of without authorization.

Amendment No. 1 to Limitation Order L-88 permits any person to sell, transfer, or otherwise dispose of not more than 10 tons of used rail during any calendar month. L-88 had halted all shipments, but it is now considered desirable to permit deliveries or sale of small quantities of scrap and other used rail.

At the same time, the amendment removed High Tee rail from the terms of the original order, thus permitting free disposal of this type of rail. High Tee rail is used largely by street car companies, and is not suitable for relaying by class I railroads.

Communications concerning used rail of the type suitable for relaying should continue to be addressed to the WPB's Transportation Equipment Branch, and communications concerning used rail of only reroll or scrap grade should be addressed to the Scrap Unit of WPB's Iron and Steel Branch.

Order L-97-a-1, Freezing Freight Car Parts, Clarified

Freight car producers may accept deliveries of parts and materials from suppliers if they are not subject to other rated orders, despite the fact that all preference ratings of A-2 or lower assigned to freight car producers recently were canceled.

Amendment No. 1 to Supplementary General Limitation Order L-97-a-1 clarifies the original order issued April 29, which prohibited producers from accepting delivery of material for car construction on orders rated A-2 or lower which was not in transit to them on that date. The amendment provides that suppliers may dispose of inventories of processed or partly-fabricated parts, if deliveries can be made to producers as on unrated orders.

Under the terms of the amendment, any producer or supplier may sell or deliver to any other producer or supplier or to a railroad any parts manufactured from materials obtained under a preference rating. This will permit balancing of inventories, and will assure maximum utilization of inventories. The original order gave this sale and exchange privilege to producers only.

Four Price Advisory Committees for Steel Industry Appointed by OPA

WASHINGTON

PRICE Administrator Leon Henderson has invited 36 steel men to become members of four advisory committees to serve as liaison groups between OPA and industry on any problems which may arise with respect to prices. The four advisory units, created under the terms of the emergency price control act of 1942, relate to general steel products; armament steels and alloys; wire products; cold finished bars.

The price control act stipulates that in the case of any commodity for which a maximum price has been established, the administrator shall, at the request of any substantial portion of the industry involved, appoint an industry advisory committee. Such requests were received from a substantial portion of the iron and steel industry.

The four groups will weigh any problems arising in connection with Revised Price Schedule No. 6, on iron and steel products, or allied or future orders affecting the steel industry.

The administrator, at the request of the advisory units, from time to time will meet with them to advise and consult on problems arising from the price schedule, its form, or classifications, differentiations and adjustments under the schedule. The units "may make such recommendations to the administrator as they deem advisable." Invited to serve on the committees are:

GENERAL STEEL PRODUCTS

Avery C. Adams, United States Steel Corp., Pittsburgh; J. W. Anderson, Sheffield Steel Corp., Kansas City, Mo.; Homer Butts, Niles Rolling Mill, Niles, O.; Norris J. Clarke, Republic Steel Corp., Cleveland; J. A. Henry, Weirton Steel, Weirton, W. Va.; Paul MacKall, Bethlehem Steel Co., Bethlehem, Pa.; J. L. Neudoerfer, Wheeling Steel Corp., Wheeling, W. Va.; W. H. Orr, Colorado Fuel & Iron Corp., Denver; L. M. Parsons, Jones & Laughlin Steel Corp., Pittsburgh; A. C. Roeth, Inland Steel Co., Chicago; W. E. Watson, Youngstown Sheet & Tube Co., Youngstown, O.

ARMAMENT STEELS AND ALLOYS

R. M. Allen, Allegheny Ludlum Steel Corp., Pittsburgh; W. H. Colvin, Jr., Rotary Electric Steel Co., Detroit; Norman L. Deuble, Copperweld Steel Corp., Warren, O.; Horace D. Disston, Henry Disston & Sons, Inc., Philadelphia; A. T. Galbraith, Crucible Steel Co. of America, New York; F. L. Gibbons, Carnegie-Illinois Steel Corp. Chicago; J. H. Parker, Carpenter Steel Co., Reading, Pa.; Martin H. Schmid, Republic Steel Corp., Massillon, O.; Rufus Tucker, Bethlehem Steel Corp., Bethlehem, Pa.; H. H. Ziesing, Midvale Co., Nicetown, Pa.

WIRE PRODUCTS

H. J. Blaser, Seneca Wire & Manufacturing Co., Fostoria, O.; John Graham, American Steel & Wire Co., Cleveland, O.; N. L. Hite, Continental Steel Corp., Kokomo, Ind.; Ernest C. Low, John A. Roebling's Sons Co., Trenton, N. J.; Henry Roemer, Jr., Pittsburgh Steel Co., Pittsburgh; Ford Schusler, Keystone Steel & Wire Co., Peoria, Ill.; C. F. Stone, Atlantic Steel Co., Atlanta, Ga.; E. C. Stout, Wickwire Spencer Steel Co., New York; G. F. Wright, G. F. Wright Steel & Wire Co., Worcester, Mass.

COLD FINISHED BARS

W. R. Howell, Bliss & Laughlin, Inc., Harvey, Ill.; V. A. Javon, Jones & Laughlin Steel Corp., Pittsburgh; W. N. Lynch, Keystone Drawn Steel Co., Spring City, Pa.; E. L. Parker, Columbia Steel & Shafting Co., Pittsburgh; J. T. Somers, Wyckoff Drawn Steel Co., Pittsburgh; F. C. Young, Union Drawn Steel Division of Republic Steel Corp. Massillon, O.

Resources Protection Board to Determine Relative Value of Plants

A RESOURCES Protection Board which will evaluate the relative wartime importance of all industrial plants, war installations, facilities and vital economic resources and make recommendations for their protection has been appointed by Donald M. Nelson, WPB chairman.

William K. Frank of the WPB Production Division was named as chairman.

The board will co-operate closely with the Army and Navy, and Maritime Commission, and Office of Civilian Defense in supplying ratings and recommendations by which they may be guided in planning the protection of resources.

It will make an over-all study of the relative importance to the war effort of all plants, installations, including factories, shipyards, railroads and communication networks, and mines and other natural resources. The hazards that will be considered will include bombing, sabotage, espionage or actual invasion, as well as natural hazards such as fire and flood.

For over a year the Army, Navy and other agencies have been putting into effect protective measures. The new board will act as a coordinating agency to assure that no important resource or facility has been overlooked.

The board will make comparative ratings for the nation as a whole, covering all plants and facilities and resources. In effect, it will act as a clearing house for all information bearing on security of resources and installations.

Other members of the Resources Protection Board include Col. Carl G. Richmond, War Department; Joseph Fennelly, Navy department; Philip Bastedo, Office of Civilian Defense; and William J. Kearny, Materials Division of WPB. Emerson Ross of WPB's Statistics Division, was named director of resources analysis. James W. Fesler of WPB's Office of the Executive Secretary, was appointed secretary.

PRP Specialists Assigned To WPB Field Offices

Specialists in Production Requirement Plan procedures have been assigned to WPB field offices.

Specially trained in Washington, these new staff members will carry on in greater detail the assistance heretofore supplied by the field offices to manufacturers operating under PRP. As their training was the same as that given to analysts on the Washington PRP staff, they are familiar not only with procedures, but also with the standards by which applications are rated at headquarters.

Manufacturers requesting assistance under PRP may save themselves time and trouble by consulting with the field analyst in their region. For example: An industrialist wishing to obtain 100 tons of steel would be advised, before mailing his application, whether the supporting data would secure the assignment of preference ratings to the desired amount, or to only a portion of it. When, in the analyst's opinion, the data would not result in the desired end, he will suggest either the addition of pertinent material to the application, or a reduction in the amount of steel requested.

Machine Tool Purchasers Must Supply Adequate Descriptions

Purchasers of machine tools must include in their orders to manufacturers specifications or other description in sufficient detail to enable the producer to place the tools in his production schedule, WPB ruled last week.

New critical machine tools were placed under a limited allocation system May 1 by General Preference Order E-1-b and the present action was included in Interpretation No. 1 of this order.

E-1-b provides for an apportionment of each producer's monthly deliveries of each size of each type of tool, 75 per cent to service pur-

chasers and 25 per cent to other purchasers.

Some prospective purchasers of machine tools have advised tool builders of their intention to purchase machines of a given type, but the tool is frequently described in such vague terms that it cannot be placed in a production schedule according to the provision of E-1-b, until additional information is supplied.

End Use Classification for Copper Allocations Prepared

A tentative "End Use Classification" to obtain standardization and reduce the number of forms that industry now must submit to WPB and to supply information needed by the WPB in the allocation of scarce materials has been prepared and circulated in the copper industry.

H. O. King, chief, WPB Copper Branch, in a letter to the Copper and Brass Research Association, New York, explained the plan as follows:

"Each and every customer of a brass mill, wire mill, ingot maker or foundry, will be required to file with his supplier a PD form which will give full information as to the use of the material ordered and other essential data.

"The information received by the mills on the forms received from customers will be condensed and recorded for the WPB on a new form. This information will be consolidated, tabulated and summarized on a new set of forms similar to the present PD-123-b, and in turn submitted to the WPB. From this information allocations of refinery brass, alloy ingot, and scrap will be made."

The code is not yet in final form and has not been officially released. It is expected, however, to be used for June 30 orders for copper for August allocation.

Later the same classification may be applied to other metals.

Production of Heavy Power and Steam Equipment Is Restricted

WPB has restricted the manufacture, delivery and sale of heavy power and steam equipment to orders for defense agencies, United Nations, lend-lease, and orders, other than repair and maintenance, rated A-9 or higher.

Purpose of the order is to make certain that no power equipment is put into production for any but highly essential purposes. It prevents consumers from using their repair and maintenance ratings to obtain new equipment.

Under Order L-117 new heavy power and steam equipment may be manufactured, sold and delivered only on an approved order.

An approved order is limited to the following:

1. An order accompanied by PD-3A certificate for delivery to the Army, Navy, Maritime Commission or certain other government agencies.
2. An order accompanied by a PD-3A certificate from the government of any of the United Nations.
3. An order placed by any agent of the United States for any of the lend-lease countries.
4. Any order bearing a preference rating of A-9 or higher assigned by a PD-3 or PD-3A certificate countersigned prior to May 18, or by a PD-1 or PD-1A certificate or a PD-19h order issued at any time.

The restrictions do not apply to the sale or shipment of equipment to regular distributors or dealers to fill approved orders previously received. Nor does the order prohibit the delivery of equipment which was actually in transit at the time of issuance of the order.

Order requires equipment manufacturers to file with the WPB on or before June 1 their production schedules for heavy power and steam equipment and a list of all unfilled orders received before the issuance of the order, whether or not such orders are approved orders.

Restrictions on Exports of Farm Machinery Modified

WPB has modified its restrictions on exports of farm machinery and equipment to allow manufacturers greater discretion in determining the types of equipment to be exported.

Under Limitation Order L-26, manufacturers were permitted to export up to 80 per cent of each class or type of equipment exported by them in 1940 and use in the production of attachments and repair parts for export up to 150 per cent of the amount of materials used to produce these items for export in 1940.

These provisions are replaced by Amendment No. 3 to this order, which authorizes manufacturers to ship to foreign countries, except Canada, and to United States territories and possessions up to 112 per cent of the net shipping weight of the total quantity of those countries in 1940. The amendment lists the countries used in determining this percentage quota. Shipments to these and other countries will be regulated through the operations of the Board of Economic Warfare and the Office of Lend-Lease Administration.

The amendment sets up quotas on various types of equipment for shipment to Canada. Producers can determine the amount that may be shipped to Canada by multiplying the quota percentage designated by the amendment for each class or type of equipment by the number of the corresponding class or type shipped to that country during 1940. Unit control on exports was retained in the case of Canada because the Canadian government has set up a unit control plan similar to that established under Order L-26, and a change by this country to tonnage control would result in confusion.

Except for shipments to Canada, manufacturers now may split up exports among their products, including new equipment, attachments and repair parts, as they deem advisable, provided they do not exceed the overall 112 per cent allowance.

Public Contracts Act Amended To Conform to Wage-Hour Law

An amendment to the Walsh-Healey public contracts act providing partial overtime exemptions under certain circumstances was described last week by L. Metcalfe Walling, administrator of both the public contracts act and the fair labor standards act, as a step toward bringing the two laws into accord.

Mr. Walling explained that the amendment provides that overtime provisions of the public contracts act may only be relaxed when employers and employes operate under agreements with unions certified by the National Labor Relations Board as bona fide, limiting employes to 1000 hours of work during any period of 26 consecutive weeks or providing for employment on an annual basis of not more than 2080 hours during any period of 52 consecutive weeks. These provisions, he pointed out, already exist under the wage-hour law. Now both laws will permit the employment of workers covered by such agreements for as much as 12 hours in any work day or up to 56 hours in any work week.

Except in the case of such agreements, the Walsh-Healey act requires the payment of time and one-half for work in excess of 8 hours in any one day or 40 hours in any one week.

New Air Conditioning Installations Restricted to Essential Requirements

WASHINGTON

WPB has banned new installations of air conditioning and commercial refrigeration equipment except to meet war and essential civilian requirements.

New installations designed solely for personal comfort, such as in theaters, restaurants and hotels will not be permitted.

Limitation Order L-38 also places rigid restrictions on the production and sale of air conditioning and commercial refrigeration equipment.

For the next 90 days, only the Army, Navy and Maritime Commission will be entitled to contract for production of such items as beer dispensers, carbonated beverage dispensers, bottled beverage coolers, low temperature mechanical refrigerators designed to store frozen food or to "quick-freeze" food, individual room coolers, florist boxes and display cases, and fountainette-type soda-fountains. After that time, production of these items must be stopped completely.

The air conditioning and commercial refrigeration industry, comprising about 700 manufacturers, had factory sales of approximately $17,500,000 worth of machinery in the last quarter of 1941. It is necessary to curtail operations of the industry in order to save substantial amounts of iron, steel, copper and other war materials.

Order L-38 prohibits the installation, effective immediately, of any new equipment except on "preferred orders." These orders apply only to the Army, Navy and Maritime Commission, certain other government agencies, lend-lease requirements, and persons possessing a preference rating of A-9 or higher issued directly to them and designating the type of equipment desired.

From May 15 to June 30, producers are prohibited from manufacturing any items of equipment in excess of the number of such items delivered on preferred orders from April 1 to May 15, or in excess of the number of such items for which unfilled preferred orders are now on hand. Producers may use the greater of the two quantities in determining permissible production.

During any calendar quarter beginning with the quarter July 1—September 30, producers may not manufacture more items of equipment than the number for which they have preferred orders on hand, or the number delivered on preferred orders during the next preceding quarter, whichever is greater.

The order places no restrictions on sales, leases or deliveries of new equipment by a dealer to another dealer or to a producer, or by a producer to another producer or to a dealer, but both producers and dealers are prohibited from selling, leasing or delivering to any other person or from installing any new equipment except to fill a preferred order.

Government To Absorb Increase in Coal Rates to New York, New England

WASHINGTON

ARRANGEMENTS whereby the federal government will absorb the increased transportation costs involved in keeping New York and New England industry supplied with bituminous coal in the face of dislocation of the normal tidewater rates by vessel from Hampton Roads, Va., were announced last week by OPA.

Primary result of the program will be to maintain in New York and New England OPA's maximum prices for bituminous coal and for coke, without imposing unreasonable hardship on coal receivers who have been compelled by the war to obtain supplies from other-than-normal sources and to make use of higher cost transportation.

Ceiling prices at the highest levels prevailing in the period Dec. 15-31, 1941, were announced for wholesale and retail sales of bituminous coal, coke, and other solid fuels in Maximum Price Regulation No. 122 issued April 30 and effective May 18.

OPA also has issued Compensatory Regulation No. 1, which specifies how applications are to be filed for compensation under the new program.

Following are the four main features of the program:

1. War Shipping Administration will reduce rates for transporting bituminous coal by tidewater from Hampton Roads, Virginia, to New York and ports north in vessels of 1000 gross tons or more.

2. Reconstruction Finance Corp. will make funds available to compensate New York and New England receivers of southern bituminous coal for the increased transportation costs involved in moving coal by all-rail, instead of by tidewater. Amount of the compensatory adjustment will consist of the difference between the present all-rail transportation cost and the cost of bringing southern bituminous coal in colliers via the tidewater route at Dec. 15-31 rates. The same adjustments will be available for coal to be moved by rail in combination with small vessels or barges.

3. Reconstruction Finance Corp. to compensate New York and New England receivers who formerly used coal from the southern fields, but are now dependent for supplies on northern fields.

4. Adjustments also will be made by Reconstruction Finance Corp. for New York and New England dealers who have stocked bituminous coal within recent months at higher transportation costs reflecting increases since Dec. 15-31 and who are now being compelled by Maximum Price Regulation No. 122 to lower their prices. These adjustments will be measured by the difference between the transportation costs actually incurred and the cost of bringing southern coal up by the tidewater route at the Dec. 15-31 vessel freight rates.

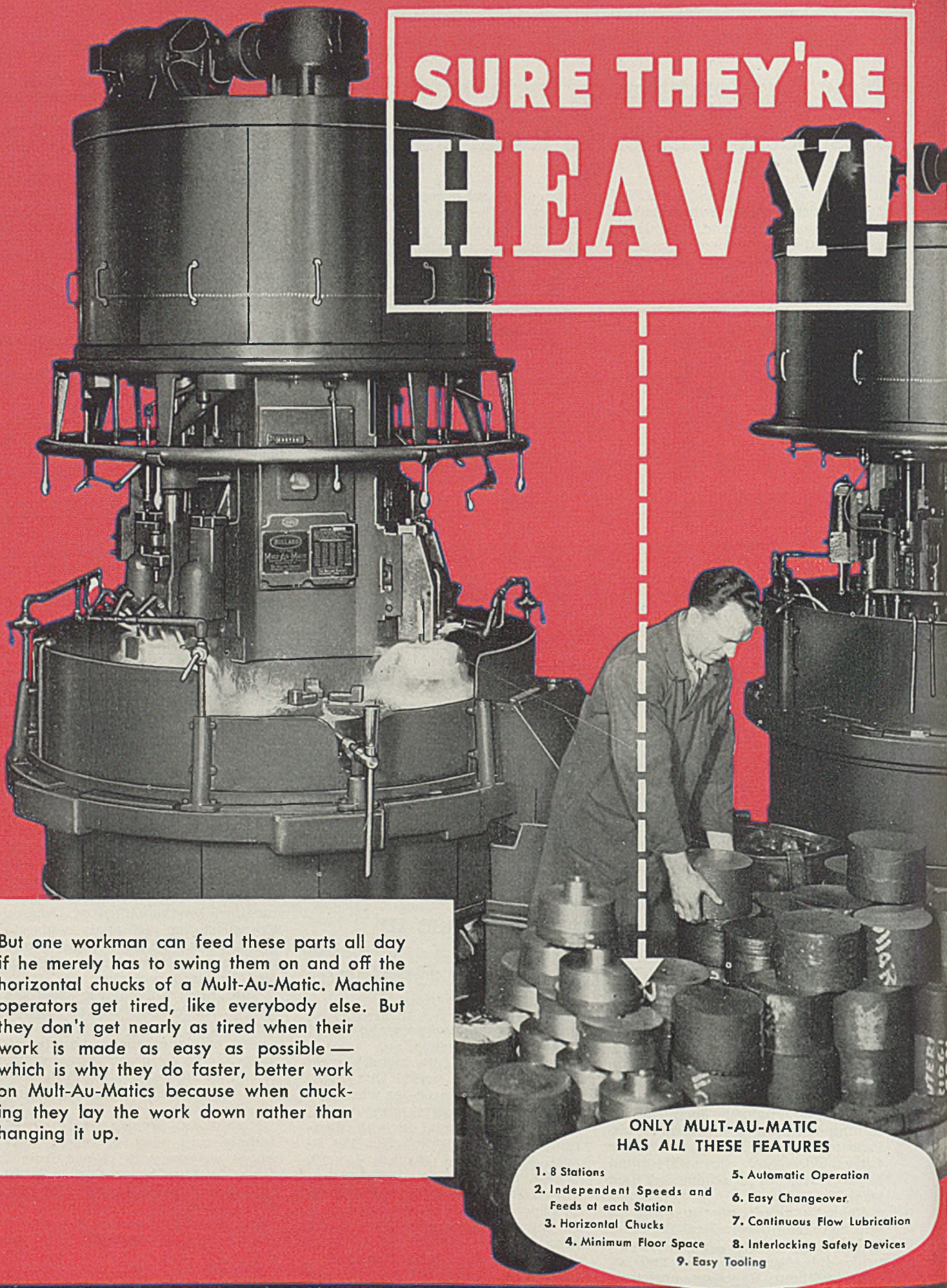
Restrictions on Use of Freight Cars Modified

Blanket restrictions on the use of closed freight cars in any kind of intraterminal freight movement, recently imposed by an amendment to General Order No. 1, have been modified by the Office of Defense Transportation to apply only to less-than-carload merchandise where such cargo can be conveniently handled by motor vehicle.

The new amendment specifies that, with certain exceptions, no carrier may load or forward between points in the same municipality, or between contiguous cities, or within adjacent zones, "any railway closed freight car containing merchandise."

Exceptions provide that closed freight cars may be used: (a) where necessary to relieve freight house facilities because of inability to obtain transportation by motor vehicle; (b) where motor vehicles are not available; (c) where carrier, shipper or consignees' facilities make motor transport impracticable, and then only if such car contains the net tonnage demanded by the general order; (d) where authorized by ODT permit.

SURE THEY'RE HEAVY!



But one workman can feed these parts all day if he merely has to swing them on and off the horizontal chucks of a Mult-Au-Matic. Machine operators get tired, like everybody else. But they don't get nearly as tired when their work is made as easy as possible — which is why they do faster, better work on Mult-Au-Matics because when chucking they lay the work down rather than hanging it up.

ONLY MULT-AU-MATIC HAS *ALL* THESE FEATURES

1. 8 Stations
2. Independent Speeds and Feeds at each Station
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6. Easy Changeover
7. Continuous Flow Lubrication
8. Interlocking Safety Devices
9. Easy Tooling

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Mirrors of MOTORDOM

Motor capital argues pros and cons, mainly the latter, of nation-wide gasoline rationing plan. Bound to affect war production effort adversely. Doubt advisability of "garaging" rubber when it will last maybe two years . . . Shotblasting tank parts to improve fatigue strength . . . GM war deliveries up 15 per cent in April . . . UAW putting Lewis in his place

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

PROSPECTS of nationwide rationing of gasoline on a stringent scale beginning July 1 did not set well with Detroiters who as an industrial class are probably doing as much or more than any other area in speeding the output of war products. The private automobile here is an absolute necessity, public transportation systems being entirely inadequate to handle the day and night flow of people from their homes to their jobs in plants scattered all over the map. Large sections of suburban residents will average anywhere from 15 to 50 miles a day of driving, and any plan to allot these people a niggardly 3 gallons of gasoline a week is inconceivable.

General tone of comments about rationing here was distinctly hostile, particularly in view of recent reports dealing with the destruction of 2,000,000 gallons of gasoline in Chicago because of lack of storage space. Admittedly there is ample gasoline for normal requirements; hence the only excuse for rationing is to conserve rubber. On this score there is plenty of argument, many feeling that tires will deteriorate just as rapidly standing idle in garages as if driven regularly.

Regimentation Galls

OPA officials state the present rate of tire use indicates 20,000,000 automobiles will be de-tired within 12-15 months. Where is the advantage in legislating these 20,000,000 cars off the road now by artificial withholding of fuel, when many of them are vital to continuation of the present rate of war production? Why not run them until the tires are down to the fabric and then let people worry about doubling up on transportation?

Americans uniformly resent regimentation—that is what they are fighting a war about—and while they are perfectly willing to accept some measure of regulation during wartime they resent being treated like babies—their sugar doled out in lumps and their gasoline in pints. Particularly is their resentment expressed when they hear reports from Michigan farmers who cannot plant sugar beets because of the threat of benefit payments being withheld, and when they hear of refineries bursting with stocks of fuel.

As far as rubber is concerned, stocks of natural rubber now on hand appear sufficient for military equipment for the next year, certainly if some obvious economies could be effected in the use of rubber on this equipment. For example, what is the need of a heavy, thick-treaded tire on a mobile field piece which probably would carry the gun 50,000 miles, when the maximum distance the gun ever will travel on its own tires probably can be measured in the hundreds of miles? Answer of army officials to queries like these is that they are the ones to decide what amount of rubber should be used on military equipment and if they are to be entrusted with the job of winning the war, they should not be bothered with suggestions about "economizing."

Recently Ford engineers announced perfection of a rubber tire which carried only one-sixteenth of the normal amount of rubber, but they indicated that if their experiments were successful the results would be passed along to the military, and civilians should take no comfort from the announcement.

Vacationists who had been planning excursions into the gasoline no-man's land of the East have been consulting with tourist experts about various ways to insure their fuel supplies. Devious routes have been mapped whereby such travelers could fill their tanks at a jumping-off place and have enough to last them until their return from the barren country. Others have considered storing five-gallon cans of fuel in their luggage compartments, but the soundness of this idea has been questioned from the standpoint of the fire hazard involved. Ethyl Gasoline Corp. "advises against this."

Enforcement methods in the East already have brought official protests, the American Automobile Association pointing out that the American motorist is "responding in a very excellent manner to the request of the government that he conserve gasoline," and urging that "rationers in general avoid creating the appearance of harassing motorists over whether or not they are using a pint or two of gasoline for purposes that to the more literal minded of the functionaries appear to fall a little outside the strict letter of the regulations."

Tank Parts Shotblasted To Improve Fatigue Life

Manufacturing innovations which have stood the test of time in automobile manufacturing are being transferred rapidly to the production of military vehicles and equipment, giving them added "oomph" which should prove valuable in combat. One of many cases in point is the shotblast method of improving the fatigue life of steels. Tested and approved in certain motor car parts such as springs for a number of years, the technique is now being developed for tank parts.

L. A. Danse, Cadillac metallurgist, was reminiscing the other day about his experience with this method of surface treatment. He recalled that his first knowledge of it dated back to boyhood when he used to watch sawyers in lumber mills "peen" their steel saw blades after they had gone "dead" as a result of the cold work the metal encountered in steady sawing. A number of unhealthy "explosions" of these big saws led to the perfection of the

peening treatment as a means of restoring their fatigue resistance.

Years later, Cadillac was having serious difficulty with breakage of valve springs, a trouble which most other car builders experienced at one time or another. Progressive stiffening of the springs by using heavier wire seemed to have little effect upon breakage in service. Finally, in desperation, Mr. Danse suggested shotblasting the finished springs, and nearly got himself fired for what then sounded like a ridiculous suggestion. However, before anything could be done about his personal status, he had some of the springs shotblasted and put on a fatigue-testing machine, enabling him to bring to an engineering conference data which showed the "peened" springs were bearing up after hours of fatigue testing, where the untreated parts often failed in 15 or 20 minutes of test.

Mr. Danse claims no exclusive credit for originating the shotblast treatment of steel surfaces. Others have done it before him and since. His idea sprang principally from familiarity with the Herbert Cloudburst system of hardening and detection of soft spots in steel. This process involved dropping a continuous stream of steel balls on a steel surface to provide the peening action which is now produced by the stream of steel shot.

Deliveries of war materials from General Motors plants in the U. S. and Canada during April reached a total of approximately $112,000,000, representing an increase of $17,000,000 over March. Total deliveries for the first quarter of the year exceeded a quarter of a billion dollars. Hourly rated factory employment for the week ended May 2 in GM plants totaled 185,446, while average number of salaried and hourly employes on the payroll in April was close to 235,000.

UAW-CIO Condemns Lewis' Methods and Isolationism

Heralding the impending showdown between John L. Lewis and Philip Murray on the question of who is going to run the CIO union, the United Automobile Workers branch of the CIO recently directed a printed blast at Brother Lewis, saying among other things: "1. We do not like your prewar isolationism; and we don't like the lukewarm, lip-service way you are supporting the war now.

"2. We do not like your dictatorial attitude toward the President of the United States, Commander in Chief of our war effort.

"3. We do not like your attempted assumption of dictatorial powers within the CIO.

"4. We do not like the fact that your closest associates are conducting a filthy, personal character assassination campaign against Philip Murray, R. J. Thomas and other CIO leaders who will not bow to you and thus betray their oaths of office.

"5. We do not like your organizations raiding organizations of the UAW-CIO and other CIO unions."

The latter "no-like" refers particularly to what is called District 50 of the United Mine Workers which has been making concerted efforts to corral membership in the Eastern Michigan area; the UAW dubs Lewis' District 50 as a "catchall for anything it can get outside or inside of the existing unions."

Ford Summons Union To Draft New Contract

UAW-CIO recently issued a new series of demands for changes in its contract with Ford Motor Co., which less than a year ago went "all out" in acceding to the union shop and checkoff systems.

One of the new demands was for higher wages, and following its issuance Harry H. Bennett of the company declared in a public statement that higher wages were unjustified and would only accelerate inflation. He intimated that if the union persisted in its demands the company might be forced to withdraw the dues checkoff system. Last week the company formally asked the union to attend conferences for the purpose of drawing up an entirely new contract, which suggests to some that revision of the union shop and checkoff phases of the Ford contract might be contemplated.

Wage provisions of a new contract negotiated by the UAW-CIO with the General Spring Bumper Division of Houdaille-Hershey Corp. here are interesting. Covering 700 employes, they provide for time-and-a-half pay for work over 8 hours in a day or over 40 hours in a week, and double time after the eleventh hour of work in any one day, after 8 hours' work on the sixth consecutive working day, and for the entire seventh consecutive working day.

The contract further provides that no workman may be sent home during the week in order to avoid overtime payments; wages to be discussed every 30 days in order to adjust them to living costs; wages to be equal to those paid by all competitors; workmen to receive 2½ per cent of their annual income as vacation allowance, and also to receive 2 cents an hour as a bonus; 80 hours' pay for workmen inducted into the army or who volunteer; and additional adjustment made to provide pay for a 15-minute lunch period.

It will be interesting to see how closely forthcoming wage agreements in the motor and steel industries pattern this small-company agreement.

Armor Plate Welding Student Graduates

TRANSITION from automobile body building to armament work required many workers to undergo additional training to qualify for their new jobs. This photo shows a former welding line foreman in a Fisher Body plant receiving his armament work "diploma" as he fastens a sample of armor plate welding, approved by the Army, to the certified welders' board. This means he now is qualified to do work on heavy armor plate. Welding supervisor, left, smiles satisfaction

WING TIPS

Pursuit plane of 1942 has three times the speed, weight and horsepower of its 1922 counterpart . . . Censorship muzzles aircraft companies, but senators and congressmen talk on . . . Flying Fortress production 70 per cent ahead of schedule, as result of effective subcontracting system . . . Flying boat costs $600,000; radial engine of 2000-horsepower $24,000

DON BERLIN, designer of both the P-36 and P-40 series of Curtiss pursuit planes, and associated with Curtiss for eight years until his recent appointment as aeronautical engineer on the Detroit staff of O. E. Hunt, vice president of General Motors Corp., has assembled some interesting generalities showing progress in pursuit ships.

Taking the best of such designs 20 years ago and comparing it with the best today, he observes that the 1942 model has three times the weight of its 1922 counterpart, three times the engine horsepower and three times the speed. Wing area of the two planes is about comparable, yet drag of today's ship is only one-third that of the 1922 design. Principally as a result of cleaning up the design aerodynamically, top speed has been increased at the rate of 1 mile per hour, per month over the preceding 20 years.

It is startling to speculate on whether an achievement of this scope can be attained in the next 20 years. With the speed of sound (about 750 m.p.h.) now apparently the point beyond which efficiency drops seriously because of the "compressibility phenomenon," it is going to be difficult to maintain the 1 mile per hour, per month increase in airplane speed, since the compressibility effect is already a disturbing factor in such things as propellers, and especially in propeller tips.

Mr. Berlin has surrounded himself with a corps of automotive engineers—nine of them from Packard and most of the others from GM divisions—and is attempting to correlate automotive engineering practice, as well as production practice, with techniques prevalent in the aircraft industry. The latter Mr. Berlin knows intimately, since he has spent his entire career after graduating from Purdue university in aeronautical engineering, being associated with the Army Air Corps at McCook Field, Dayton, O., then with Douglas, Northrop and Curtiss-Wright.

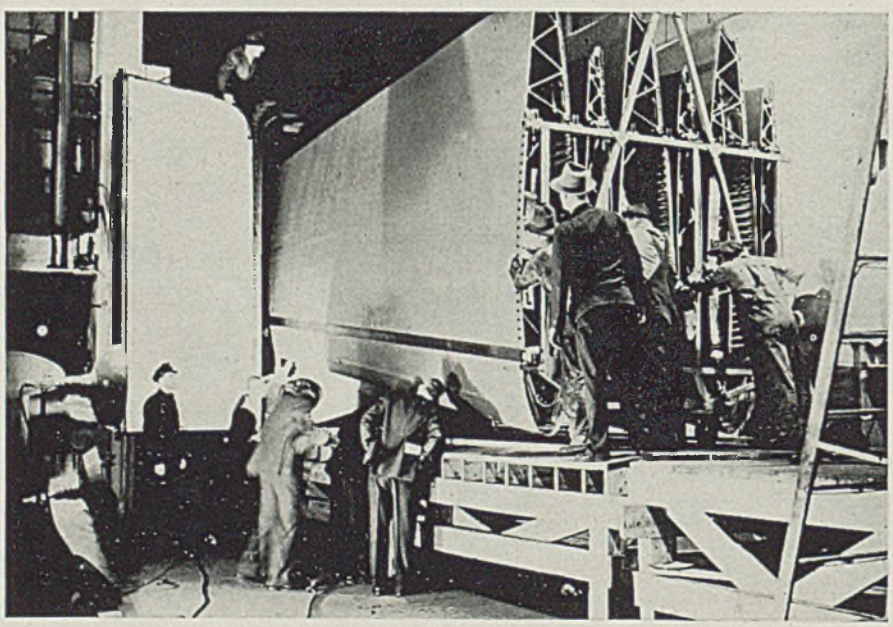
Censorship Restrictions Effective Only in Spots

Release of information concerning new projects in the aircraft field is becoming a difficult matter, full of inconsistency and guesswork occasioned by military restrictions on news. Normal company sources are completely muzzled and face dire threats from censorship officials if they release any details other than perhaps a few praiseworthy reports of American equipment in action. Yet congressmen reveal information to local constituents with apparent immunity.

An example is the new Bell Aircraft plant in Georgia. When news was first heard of this project, STEEL attempted to get confirmation from the company but was told that nothing could be said about it. However, Georgia congressmen were talking about the project and their comments were used by the news services. A second case is the expansion of the Allison plant in Indianapolis. Absolutely no confirmation of this report could be obtained from the Allison spokesmen, although newspapers in Indianapolis used the item, even reporting that the expansion involved doubling the plant at a cost of $50,000,000.

Speculating on why the Allison plant is being expanded, it is not

Bomber Wings Shipped Thousands of Miles



Three sets of outer wings and wing tips for the Flying Fortress, four-motor long-range bomber, here are being loaded into specially constructed box car for shipment from the Murray Corp. of America, Detroit, to assembly plants several thousand miles distant. Car measures 17 feet 1 inch from rail to top, and about 40 feet long and 11 feet wide. These special cars, loaded from the end, have been supplied by railroads for the express purpose of shipping aircraft wing sections. Another type is even larger than the one shown.

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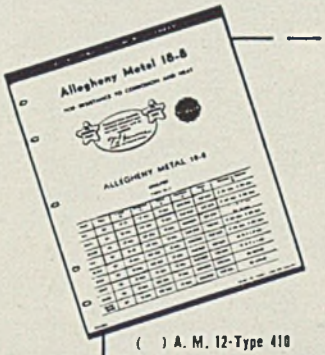

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difficult to imagine that the W-type or "double" Allison engine, on display at the World's Fair and at various industrial exhibitions in recent years, is going into production for some new type of large-size plane. This engine runs about 2600-horsepower and can be visualized by any who have not seen it by placing two of the present V-12 engines alongside, with a common crankshaft, thus making it a 24-cylinder engine. Possibly this engine will be used in the plane which Douglas will build at a projected plant in the Middle West, news of which has been printed in recent weeks and should bring distinct hindrance and dismay to enemy air forces, if their agents have used powers of observation.

Subcontracting Lifts Boeing Production Rate 70 Per Cent

With the authorized information that production of four-engine Boeing bombers of the Flying Fortress series is 70 per cent above the scheduled rate, it is evident the aviation industry has evolved a subcontracting formula of considerable promise as a pattern for expanding output of other types as well.

At present the particular setup applies primarily to output of the four-engine ship, but there are indications that it will be increasingly adapted to expanding production of other types from now on.

The first step was a general standardization of the four-engine type, with needs of the services of associated nations also in mind. There was general agreement accordingly on the B-17 of "E" series, but with modifications to adapt it to use of other nations that really make this model an "F" (or sixth redesign) of the series.

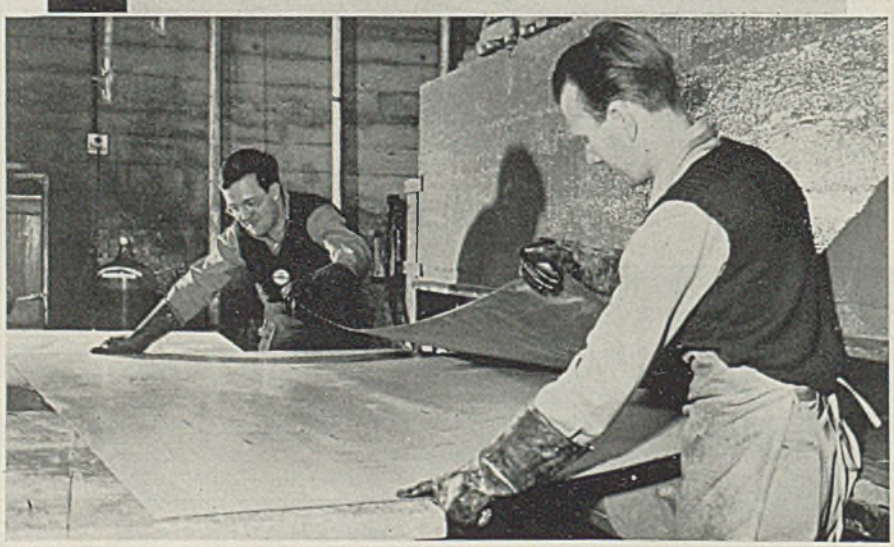
These modifications cannot be detailed here for military reasons but it is believed they will be such as to harmonize the newer models of the Flying Fortress to the requirements of both our own and English or other air arms, interchangeably. This principle is merely a further step in the plan of making parts of the bombers themselves so completely interchangeable as to facilitate both assembly in the plants and maintenance under field conditions.

The general subcontracting program on these big ships comprises a joint committee of Boeing and representatives of the major plants engaged in four-engine bomber production. For example, representatives of Boeing, Vega and Douglas companies have organized a liaison group which serves as a hopper for subcontracting firms serving all three. The number of such subcontractors may run into the dozens on just one particular item.

The parent company of the design, in this case the four-engine Boeing, has furnished the others

Electrolytic Transfer Process Speeds Template Production

Electrolytic transfer process is speeding production of templates from master patterns at Vega Aircraft Corp's., plant in Burbank, Calif., which is working with Boeing and Douglas under a pooling arrangement for manufacture of Flying Fortresses. A development of Lockheed engineers, the process permitted rapid duplication of templates from the single master set available.



Twenty-seven men spent four months in Seattle reproducing 28,000 templates by hand from master boards at Boeing. Each of these was sent to Burbank where reproductions were made by the new process which required only five minutes each. The process involves three steps: Preparation of the original drawing; scribing the drawing on a galvanized sheet coated with insulating paint and two coats of clear lacquer; and electrolytic transfer of the scribed layout to a sheet of terne plate, from which the work template is cut.

The scribed sheet is held against the terne plate under pressure of 50 pounds per square inch while the two sheets are immersed in ferrous sulphate. Passing a 6-ampere current from a storage battery through the sheets for 10 seconds results in deposition of a black iron salt on the terne plate where lines have been scribed through the lacquer on the master template.

After washing and drying, the terne plate is sprayed with clear lacquer before it is cut up and dispatched to production departments. One of the illustrations shows a draftsman scribing lines on the coated master template; the other shows workmen removing the sheets from the electrolytic reproduction press.

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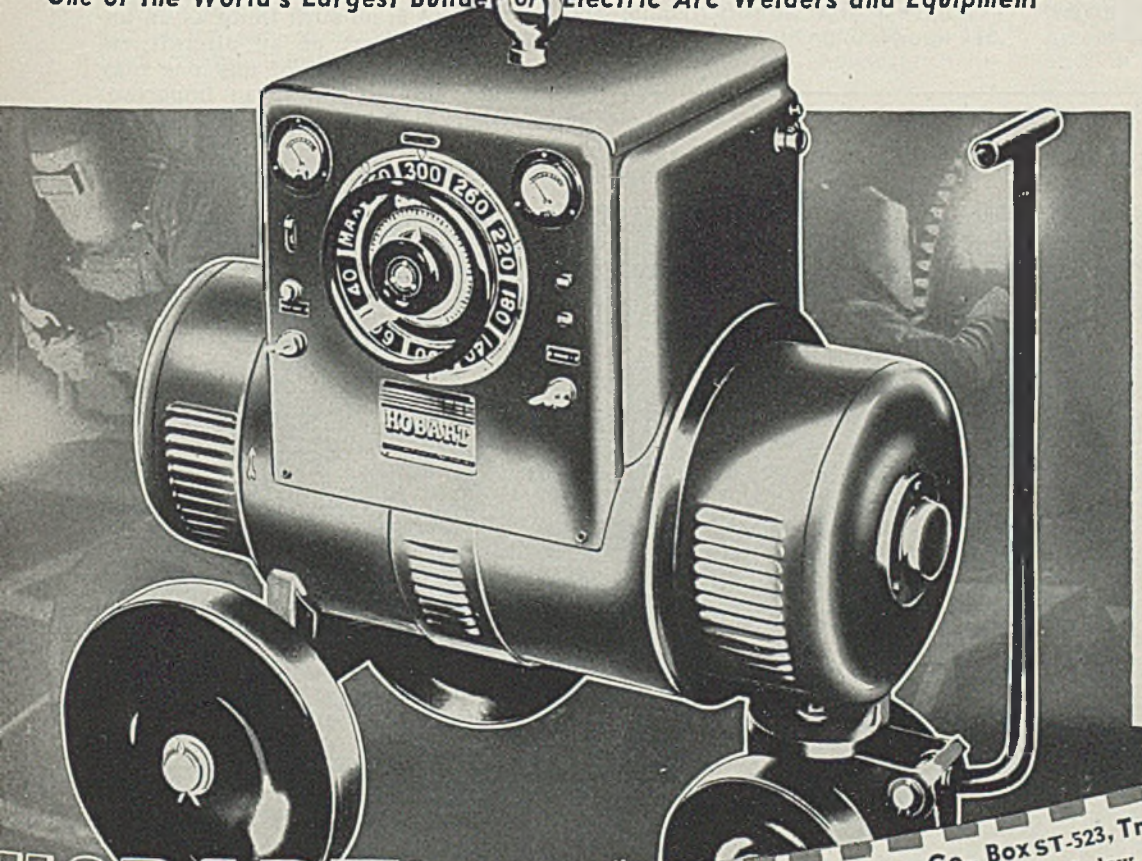

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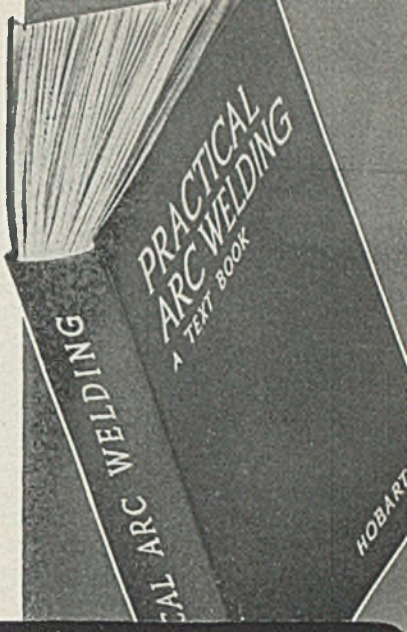

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concerned with a complete set of jigs, dies, tools, prints, and even a complete plane. To grasp what multiple divisions of subcontracting are under way, assume a big plane laid out on a factory floor by its principal components, in their proper order of assembly, front to back, so that if a gigantic suction device were used, parts would click into place and a complete plane would stand on the plant floor.

These parts are all numbered on a blueprint, to designate their proper place in the assembled aircraft. Code numbers are assigned to indicate what companies are making them for each of the major assembling plants. Each part under manufacture is subject to air corps inspection and approval for final assembly at the subcontracting plant, which is a vital speed-up step. Another is that each part, as already indicated, is being made with such precision, despite mass production, that it can be used in any ship of the type or class intended, and not a specific four-engine plane.

From the field already have come reports of actual cases in which planes of various types have been rebuilt from parts of others. In the future, because of the present insistence on interchangeable parts, this will probably cease to be an isolated case each time, and no longer a miracle, as in the instances already reported.

For further example, the outboard nacelle assembly for the four-engine ship is made by two subcontracting plants, widely separated, but the parts are interchangeable for assembly purpose, regardless of the source, or where assembled. Three major plants are building the finished Flying Fortress of present design. A wheel manufacturer is making the tail wheel assembly for all three. Fuel tanks are being turned out by three rubber companies. A separate aircraft plant is making for all three assembling plants the stabilizers, elevators, fins and similar installations.

All subcontracting plants are furnished with pilot models of the parts to be made, and are completely advised on production problems. However, each of the three major production units is on its own as to operating plans. It undertakes to get out the planes, and is not dominated in any way by the company fostering the design.

Aircraft and Equipment Manufacturing Costs High

Aircraft and aircraft equipment are known to be high in manufacturing cost, because of the top-grade workmanship and material involved. An appreciation of the costs involved is given by the fact that a typical three-blade propeller, of the type used on bombers, runs between $2000 and $2500 in manufacturing cost, or roughly three times the cost of a passenger automobile. A 2000-horsepower radial engine of the most modern type will average about $24,000, or the equivalent of about 30 automobiles. And a large four-motor flying boat, such as the Vought Sikorsky Excalibur type involves a neat $600,000, which is equal to about 750 automobiles, but is still a long way from 50 millions of dollars required for a modern battleship.

Dedicate Two Million-Dollar Addition to Ferndale Plant

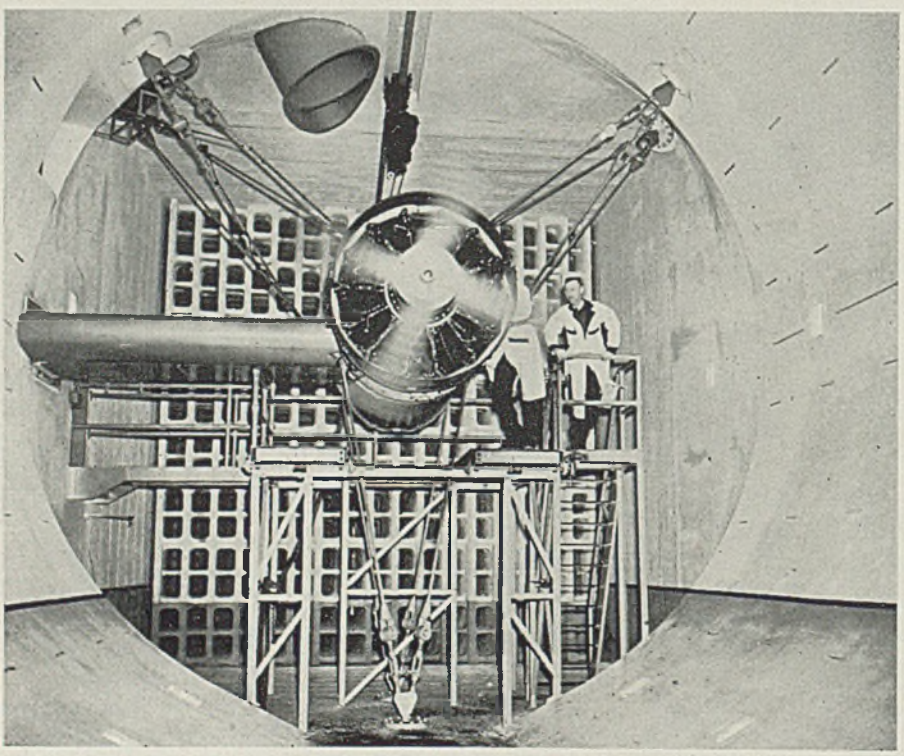
Air Corps and civilian speakers and several hundred employes joined in launching a $2,000,000 expansion program which will double floor space of N. A. Woodworth Co., Ferndale, Mich., an important source of aircraft engine parts.

Principal speaker was W. W. Finlay, general manager of Wright Aeronautical Corp.'s Lockland plant at Cincinnati. He said in part:

"There is no such thing as an unimportant part of an aircraft engine. The failure of any one may mean the failure of an important mission. The failure to provide any one part on time may mean the delay of an offensive, resulting in those two terrible words, 'too late'."

Maj. Charles H. S. Russell, representing the Army air forces, and himself a World War ace, also spoke and emphasized the urgency of full productive effort in industry.

Cleveland Aircraft Engine Laboratory Starts Tests



FIRST units of the $18,000,000 aircraft engine research laboratory at Cleveland started operations May 8 and the entire laboratory, reputed to be the largest in the world, is scheduled to be completed by the end of this year. In photo above, engineers observe an engine in operation in one of the two torque stands. NEA photo, passed by censors

Youngstown Steel Door Closed by WPB Order

Youngstown Steel Door Co., Youngstown, O., has been forced to suspend operations due to WPB's order halting use of steel by railroad car builders and parts shops. Most of the force totaling 850 has been dismissed.

Company has a $2,500,000 inventory of steel and parts on hand and between $5,000,000 and $6,000,000 in unfilled orders.

Gear Association Reports April Sales Down 17%

American Gear Manufacturers Association, Wilkinsburg, Pa., reports industrial gear sales for April, 1942 were 17 per cent below March. Sales in the first four months this year are 34 per cent over the corresponding period of 1941. The compilation does not include automotive gears or those used in high-speed turbine drives.

U. S. Building Two Cargo Vessels Daily; 30 Launched on Maritime Day

THIRTY cargo vessels slid down the ways of Pacific, Atlantic, Gulf and Great Lakes yards last Friday in what was described the greatest mass launching of merchant ships since the huge building program started.

The occasion was Maritime Day—the 123rd anniversary of the sailing of the SAVANNAH, first steamship to make an ocean crossing, from Savannah, Ga., to Liverpool, England.

Maritime Day, according to Rear Admiral Emory S. Land, chairman, Maritime Commission, marked the beginning of the two-ships-a-day schedule. Twenty-five ships had been launched during May up to Maritime Day, and the total for the year was 130. By the end of the year, the commission expects to be completing three ships a day.

Of the May 22 launchings, 11 were on the West coast, 9 on the Atlantic coast, 8 on the Gulf coast and 2 on the Great Lakes.

Plans to increase materially the output of structural steel shapes used in shipbuilding have been announced by the WPB Iron and Steel Branch.

Curtailment of other items made on the same mill equipment will make the increase possible.

Production of structural shapes has not kept pace in recent months with the expanded output of steel plates made possible by the conversion of strip mills to plate production. Therefore, it is necessary to expand shape production in June.

A directive to steel companies to carry out the program has been issued by J. S. Knowlson, director of industry operations.

Pittsburgh Steamship Co. Launches Two More Freighters

Pittsburgh Steamship Co., United States Steel Corp. subsidiary, joined in observance of Maritime Day by launching the last two of its five new ore vessels. The carriers, named for Irving S. Olds, chairman of the corporation, and A. H. Ferbert, president, Pittsburgh Steamship Co., were built at the Lorain, O., yards of American Shipbuilding Co., and the River Rouge, Mich., yards of Great Lakes Engineering Co.

Another U. S. Steel subsidiary, American Bridge Co., announces it has launched four barges a week for the past 13 weeks. Company has completed 60 all-welded coal barges of 1000 tons capacity, each with overall length of 175 feet, width of 26 feet, and draft of 11 feet, requiring 9120 tons of fabricated steel.

American Bridge recently was awarded a Navy contract for the construction of special-purpose craft. A modern plant, to cost $8,500,000, is under construction in the Pittsburgh district (STEEL, May 18, p. 43).

Great Lakes Yard, Building Submarines, Awarded Navy "E"

Manitowoc, Wis., Shipbuilding Co. has launched its first submarine months ahead of schedule and for its speed in constructing the underwater craft has been awarded the Navy "E".

The Manitowoc yards hold a contract for building ten submarines. To enable the program, the government financed a $1,500,000 expansion program and engineers of Electric Boat Co., Groton, Conn., the country's most experienced submarine builder, lent their assistance in technical problems.

Workers were recruited from Wisconsin's agricultural workers and given an intensive training course. Some still work part time on their farms.

The undersea fighters, which must be launched sidewise in Great Lakes fashion due to the narrowness of the Manitowoc river, will be floated to the Gulf of Mexico via the Chicago drainage canal, the Illinois river and the Mississippi river.

Westinghouse To Operate New Plant at Greensburg

A $14,000,000 plant will be built in western Pennsylvania to make propulsion equipment for the Navy, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announced last week. L. D. Rigdon, manager of manufacturing of Westinghouse Emergency Products division, will be in charge. P. L. Lenz, formerly assistant superintendent of the company's generator division, will be superintendent of manufacturing operations.

Six hundred men and women from Greensburg, Pa., area will be given company training courses in machine tool operations to supply labor for the plant.

Site is within a few miles of company's East Pittsburgh works, which will provide parts to the new plant until sufficient machine tools are available.

Build Half a Tanker To Rehabilitate Damaged Ship

WHEN a 12,000-ton tanker struck a mine near England, the vessel broke in two and the forepart sank. The afterpart was towed into port and a new forepart built. Above photo shows the launching of the new forepart, which later was joined to the undamaged afterpart of the original tanker. The operation saved about 1500 tons of steel and the ship was rehabilitated in one-third the time that would have been required to build a new vessel. NEA photo

MEN of INDUSTRY

A. F. ALLEN has retired as secretary-treasurer, American Steel & Wire Co., Cleveland, after more than 52 years of service with subsidiaries of United States Steel Corp. He joined Illinois Steel Co. in 1890, working in the purchasing, treasurer's and secretary's office. In 1899 he became associated with American Steel & Wire, becoming secretary in 1901 and treasurer in 1928. He also served as a director of the company, and as secretary, Standard Fence Co., Oakland, Calif. He is a director, Reynolds Spring Co., Jackson, Mich.

♦

Roy F. Stiles, director of purchases, Stewart-Warner Corp., Chicago, was elected president, Purchasing Agents Association of Chicago, at its annual meeting May 14. Others elected: First vice president, **M. J. Hartigan,** Joseph T. Ryerson & Son Inc.; second vice president, **Thomas J. Anderson,** Acme Steel Co.; treasurer, **Harry H. Wise,** Scovill Mfg. Co.; secretary, **L. R. Seen,** Borg & Beck Division of Borg-Warner Corp.

♦

W. F. Munnikhysen, vice president, and **E. A. Berry,** treasurer, Koppers Co., Pittsburgh, have been elected directors.

♦

Harold P. Blum, 1615 Collamer avenue, Cleveland, has been appointed representative in the Cleveland territory for Metal & Thermit Corp., New York, He will continue to represent Una Welding Inc.,

♦

Charles L. Faust, chemical engineer, Battelle Memorial Institute, Columbus, O., has been named to a five-year term on the board of managers, Electrochemical Society.

♦

William C. Johnson, sales manager, crushing and cement division, Allis-Chalmers Mfg. Co., Milwaukee, has been named manager of the general sales organization.

♦

T. S. Grasselli, Cleveland, has resigned as a vice president and director, E. I. du Pont de Nemours & Co., Wilmington, Del., because of ill health.

♦

C. R. Owens and **R. W. Steenrod** have been appointed welding specialist and industrial heating specialist, respectively, Pacific district, General Electric Co. **E. J. Cipperly** will continue as industrial heating and arc welding specialist at the Los Angeles office. **A. D. Boardman** has been named Pacific district industrial control specialist, and **L. E. Donahue** has become industrial control specialist at Los Angeles office.

A. F. Allen

Roy F. Stiles

Harold P. Blum

♦

William Watson, vice president in charge of manufacturing, Allis-Chalmers Mfg. Co., Milwaukee, has retired. He will be succeeded by **James M. White,** general works manager.

♦

Frank H. Dewey, general manager, air conditioning division, Gar Wood Industries Inc., Detroit, has been elected a vice president. He will continue his duties as general manager.

♦

Paul Hacker has joined Pioneer Engineering & Mfg. Co., Detroit, as pump engineer in charge of sales. He formerly was associated with Packard Motor Car Co. as foreman of the toolmaking department, and later the processing department.

♦

Crispin Oglebay, president Oglebay, Norton & Co., Cleveland, received the honorary degree of doctor of laws at the commencement exercises of the University of West Virginia, Morgantown, W. Va., May 18, for "meritorious and distinguished service in business and philanthropy."

♦

John P. Bernard, vice president and assistant general manager, Sheffield Corp., Dayton, O., has been elected a director. He joined Sheffield about a month ago, prior to which he was vice president in charge of operations, Dyer Engineers Inc., Cleveland.

♦

Henry G. Riter III, senior partner of Riter & Co., New York, has been elected chairman of the board, Copperweld Steel Co., succeeding **William K. Frank** who resigned to serve on the War Production Board. Mr. Riter has been a director of Copperweld since July, 1930.

♦

Johnson S. Davis and **G.A. Shallberg Jr.** will head the newly organized advertising and publicity department, Borg-Warner Corp., Chicago, to continue and expand activities formerly handled by **F. H. Lockwood,**

who resigned recently to become publicity director, Guiberson Diesel Engine Co., Dallas, Tex.

♦

F. B. Davis has been appointed Buffalo district manager for Copperweld Steel Co., Warren, O. He formerly was associated with Edgar T. Ward Co.

♦

Harry F. Reid Jr., formerly associated with Ceramic Color & Chemical Mfg. Co., New Brighton, Pa., has been appointed research engineer, Battelle Memorial Institute, Columbus, O., and has been assigned to ceramic research.

♦

R. W. Helms has been appointed general manager of sales, Berger Mfg. Division of Republic Steel Corp., Canton, O. He succeeds the

R. W. Helms

late J. W. Strong. His first position was as a cost clerk with the Dallas branch of Berger, later becoming department manager and manager there. In 1929 he was transferred to Canton, becoming assistant general sales manager in 1935.

♦

Robert M. Zacharias has become associated with McKenna Metals Co., Latrobe, Pa. Formerly identified with Church & Church, Washington, patent attorneys, Mr. Zacharias will assist in McKenna's expansion program.

♦

A. N. Crenshaw has been appointed purchasing agent, Great Northern railroad, St. Paul, succeeding **A. H. Lillengren,** who has retired after 45 years of service. **H. B. Nordstrom** and **A. D. Sturley** have been named assistant purchasing agents.

♦

H. P. Congdon, since 1937 assistant to executive vice president, Chicago, St. Paul, Minneapolis & Omaha railroad, has been named general superintendent, with headquarters in St. Paul. **P. A. Bloom** has been

F. B. Davis

promoted to assistant to vice president in charge of operation, and **E. A. Vik** to director of personnel.

♦

Robert E. Mason, formerly associated with International Nickel Co. Inc., and Peter A. Frasse & Co., has joined the sales department of Tube Reducing Corp., Wallington, N. J.

♦

John J. Fitzgibbon has joined R. Hoe & Co., Dunellen, N. J., as metallurgist. He formerly was foundry engineer, Whitehead Metal Products Co., New York.

♦

George W. Mason, president, Nash-Kelvinator Corp., has been elected a director, Square D Co., Milwaukee, replacing **F. Eberstadt,** who resigned to take a government position.

♦

E. A. Stevens has been appointed assistant to the director of pur-

Joseph G. Schaefer

Who has been appointed vice president in charge of operations, Wyckoff Drawn Steel Co., Pittsburgh, as announced in STEEL, May 18, page 60. He will head operations in the company's plants at Ambridge, Pa., and Chicago, where he has been works manager

chases, B. F. Goodrich Co., Akron, O. He formerly was managing director of Goodrich Co. (S.S.) Ltd., rubber buying subsidiary in Singapore.

♦

Norman Baughn has joined American-Marietta Co., Chicago, as technical specialist in Army and Navy Ordnance and Quartermaster Corps paints. The past 12 years he has been associated with Cook Paint & Varnish Co.

♦

J. E. Sheehan, assistant treasurer, Meyercord Co., Chicago, has been elected president, Illinois Manufacturers' Costs Association. **R. D. Burnet,** controller and assistant treasurer, Zenith Radio Corp., Chicago, is the new vice president. **W. A. Brinker,** office manager, Mercury Mfg. Co., and **T. A. Rand,** treasurer, Acme Steel Co., Chicago, have been named to the executive committee.

♦

George A. Meyrer and **Mundy I. Peale** have been elected vice presidents, Republic Aviation Corp., Farmingdale, N. Y. Mr. Meyrer formerly was facilities manager, while Mr. Peale was assistant director of military contracts.

♦

Charles Owens Guernsey, vice president, J. G. Brill Co., Philadelphia, has been granted leave of absence to become technical advisor to **Col. D. N. Hauseman,** deputy district chief, Philadelphia Ordnance District.

♦

Robert Wagner has been appointed northeastern district manager, Westinghouse Electric Elevator Co. A Westinghouse employe since graduation from college in 1929, Mr. Wagner from 1932 to 1939 was a sales engineer in the San Francisco district. His transfer to the New York office followed and he has been there until the present time.

♦

L. F. Donald, assistant general manager of the eastern lines, Chicago, Milwaukee, St. Paul & Pacific railroad, Chicago, has been named general manager of western lines, with headquarters in Seattle, succeeding **N. A. Ryan,** who has been called to active duty with the military railway service of the Army. **L. K. Sorensen,** general superintendent in Milwaukee, succeeds Mr. Donald as assistant general manager of eastern lines.

♦

William D. West has been named sales representative in western South Carolina for Magnus Chemical Co., Garwood, N. J., with headquarters in Greenville, S. C. **Edwin M. Tait** has been made sales representative in Minnesota and South Dakota, with headquarters at Minneapolis.

DIED:

Rudolph E. Hellmund, 63, chief engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., May 16, in New York. Inventor of electrical devices covered by more than 250 United States and foreign patents, Mr. Hellmund had been associated with Westinghouse 35 years, since 1933 as chief engineer.

♦

Charles W. LaPorte, 68, vice president, a director and a member of the executive committee, Keystone Steel & Wire Co., Peoria, Ill., May 12, in Rochester, Minn.

♦

Robert Gilmore, 63, general manager, wire rope division, Jones & Laughlin Steel Corp., Muncy, Pa., May 14.

♦

George A. Decker, 77, a director, Warner & Swasey Co., Cleveland, and works engineer for 25 years before his retirement in 1940, May 13, in Cleveland.

♦

Henry Luedinghaus, 81, president, St. Louis Malleable Casting Co., St. Louis, in that city, May 18. He was also president, Beck & Corbitt Co., and a director, St. Louis Screw & Bolt Co., and St. Louis Car Co.

♦

Kalman Miller, 75, Miller Bros. Iron & Metal Co., Milwaukee, May 17, in that city.

♦

Raymond W. Goodrow, 50, president, Sherer Gillett Co., Marshall, Mich., May 11, in that city.

♦

Harry J. Felsburg, 57, manager of the Philadelphia office, Sterling Wheelbarrow Co., Milwaukee, May 12, in Philadelphia.

♦

Martin Kaiser, president, Kaiser-Barnett Coal & Coke Corp., Buffalo, May 15, in that city.

♦

Arthur E. Crockett, 69, special representative for Jones & Laughlin Steel Corp., Pittsburgh, May 20, in that city.

♦

Dr. Clayton Halsey Sharp, 72, electrical engineer and physicist, who was vice president, Electrical Testing Laboratories, New York, May 13, in White Plains, N. Y.

♦

John M. Fiske, 84, president, J. W. Fiske Iron Works, New York, May 14, at his home in East Orange, N. J.

The E. J. Block Athletic Field and Park will be presented to East Chicago, Ind., by Inland Steel Co., on Memorial Day. The gift includes a $100,000 stadium for 8000 persons, tennis courts, four soft-ball courts and large park, and is in memory of the late E. J. Block, former Inland vice president. Wilfred Sykes, company president, will make the presentation.

MEETINGS

Metal Congress To Be Held In Cleveland in October

The War Production Edition of the National Metal Exposition will be held in conjunction with the National Metal Congress in Public Auditorium, Cleveland, Oct. 12-16, instead of in Detroit as originally planned. The exposition will be "an educational demonstration clinic devoted to increased production, planning, engineering, improvement of materials, job training, conservation, substitution and maintenance." Varied exhibits, catalogs, blueprints, personal conferences and group discussions also "will aid in accomplishing greater and speedier production."

American Society for Metals, American Welding Society, Wire Association, and Iron and Steel Division and Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers will co-operate.

Convention Calendar

May 25-28—National Association of Purchasing Agents. Twenty-seventh annual convention, Waldorf-Astoria, New York. George A. Renard, 11 Park Place, New York, is executive secretary.

June 5—American Management Association. General management meeting, Hotel Pennsylvania, New York. H. J. Howlett, 330 West 42nd street, New York, is secretary.

June 8-10—American Society of Mechanical Engineers. Semiannual meeting, Hotel Statler, Cleveland. C. E. Davies, 29 West 39th street, New York, is secretary.

June 11-12—National District Heating Association. Thirty-third annual meeting. Biltmore hotel, Dayton, O. John F. Collins Jr., 827 N. Euclid avenue, Pittsburgh, is secretary.

June 22-26—American Society for Testing Materials. Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. C. L. Warwick, 260 S. Broad street, Philadelphia, is secretary.

Form Acid Open-Hearth Research Association

Recent meeting of metallurgists from steel foundries in the Pittsburgh district resulted in formation of the Acid Open-Hearth Research Association, with headquarters in Pittsburgh. It will be an independent organization concerned with active research in problems of the acid open hearth, announcement stated.

Foundries plan to solicit memberships among all acid open hearth operators and to establish two research fellowships for continuous study.

Enameling Industry Considers Conversion

Representatives of the porcelain enameling industry discussed conversion to heat treating for war production at a meeting in Cincinnati, May 19. The morning session was devoted to a talk by E. E. Thum, editor, *Metal Progress,* Cleveland, on the process which could be carried on by porcelain enamelers in their present plants. C. C. Cone, Surface Combustion Co., Toledo, O., suggested methods for converting porcelain enameling furnaces to heat treating work. John R. Green, Brown Instrument Co., Philadelphia, explained the use of modern control equipment in these processes.

At luncheon, attended by 75 representatives R. C. Todd, American Rolling Mill Co., Middletown, O., reviewed the steel situation in the light of the recent M-126 order.

In the afternoon, Frank E. Hodek, General Porcelain Enamel & Mfg. Co., Chicago, presided at a round-table on conversion problems. Assisting him were Prof. R. M. King, Ohio State University, Columbus; Dr. A. I. Andrews, University of Illinois, Urbana; Harry Smith, Youngstown Sheet & Tube Co., Youngstown; Walter G. Hildorf, Timken Roller Bearing Co., Canton, O.; W. H. Wilson, Ferro Enamel Corp., Cleveland.

Announce New Direct Field Engineering Offices

Cincinnati Milling Machine Co., manufacturer of milling, broaching and cutter sharpening machines, and Cincinnati Grinders Inc., manufacturer of grinding and lapping machines, will on June 1 serve customers in New York state and New England through their sales subsidiary, Cincinnati Milling & Grinding Machines Inc., with district offices in New York, Hartford, Boston, Buffalo and Syracuse.

A staff of field engineers, service men and demonstrators, long technically trained and thoroughly experienced in milling, broaching, cutter sharpening, grinding and lapping methods, will provide prompt and effective service to the manufacturing industries in those areas.

Henry Prentiss & Co. Inc., who have acted as the companies' exclusive dealer in New York state and New England since 1887, have announced their retirement from active business May 31.

Activities of Steel Users and Makers

"Steel for Victory", a short film produced by the United States Steel Corp., and "There's a Job To Be Done", a short film by Allegheny Ludlum Steel Corp., Pittsburgh, are being shown before various groups throughout the country. Both deal with the part steel plays in modern warfare and stress the industry's all-out effort to produce the materials of war. It is expected that both films will be made available to motion picture houses.

♦

Howard D. Grant, executive vice president, Whiting Corp., Harvey, Ill., last week announced approval by the government of a building program which will add approximately 55,000 square feet of manufacturing space to company's factory. Cost will be about $325,000, not including tools.

♦

John F. Diehl, 1728 Grand Central terminal, New York, has opened a warehouse at 210 East Thirty-fourth street, New York, carrying stocks of toggle clamps, manufactured by Detroit Stamping Co., Detroit.

♦

Safway Steel Scaffolds Co. of Wisconsin, Milwaukee, has changed its name to Safway Steel Products Inc.

♦

Gary Steel Supply Co., 7450 South Ashland avenue, Chicago, has acquired a building of 30,000 square feet at 2300 South Springfield avenue, and will move to that location about June 1.

♦

American manufacturers built more tanks in April than they did during all of World War I, W. H. Harrison, director of production, War Production Board, told 1000 members of the Brooklyn, N. Y., Chamber of Commerce, in that city last week. "In May tank output will be greater than last month, and before the end of the year it should be four times greater than at present," he added.

♦

Latrobe Electric Steel Co. has moved its Chicago office and warehouse from 100 South Jefferson street to 2039 West Jackson boulevard.

♦

Pittsburgh offices of Crucible Steel Co. of America have merged with the Crucible offices in Cleveland and Detroit to better administer the steel requirements of those areas. The Cleveland office, which continues under managership of Frank E. Phelps, is at 1258-74 East Fifty-fifth street. The Detroit office, under managership of William G. Hassel, formerly manager of the local Pittsburgh office, is at 3245 Hubbard avenue. C. J. Ryan, associated with Crucible in various mill and branch office capacities, has been named assistant manager at Detroit.

♦

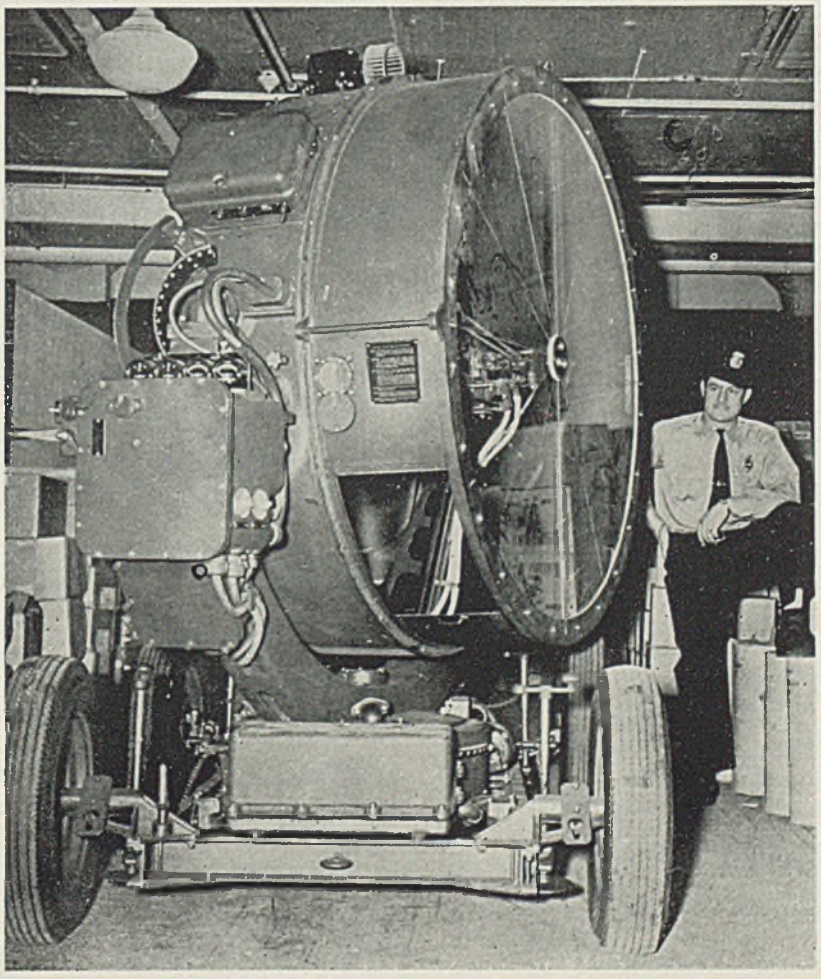
Sales of industrial heat treating furnaces increased from $16,475,000 in 1937 to some $60,000,000 in 1941, according to figures announced by Stewart N. Clarkson, executive vice president, Industrial Furnace Manufacturers Association, in annual meeting last week at Hot Springs, Va. Mr. Clarkson said that the industry has met every demand of government for steadily increasing production.

♦

"Utilizing Salesmen in Wartime", a symposium conducted by G. M. Basford Co., New York advertising firm, to discover what has become of men in sales forces of more than 60 consumer-goods manufacturers, reveals that 50 per cent still are covering their territories, some with extra duties, 10 per cent are in the armed services, 15 per cent have been let out, and 25 per cent have been given non-selling assignments.

♦

Despite the fact that General Electric Co., Schenectady, N. Y., has more than doubled its manpower in the past two years, and has taken on thousands of employes without any previous experience in factory work, the number of days lost due to accidents in 1941, per thousand hours worker, was second lowest of any year, George E. Sanford, chairman of company's general safety committee, reported last week. First quarter of 1942 shows a 50 per cent improvement over the same period of 1941. Lowest year on record was 1940.



ANTI-AIRCRAFT searchlight of 800,000,000 candlepower, now going into production at the rate of several hundred a month in Murray Corp. of America's Detroit plant. Delicately balanced and precision made throughout, the 65-inch diameter light originally was built up mainly of aluminum castings, but now has been redesigned for steel stampings, saving, on the basis of projected output, more than 100,000 pounds of aluminum a month. Power for the portable carbon-arc light is supplied by a separate motor-generator set, likewise mounted on a wheeled chassis

New Awards, Army "A" and Army-Navy Star, for Meritorious Production

WASHINGTON

WAR Department has created a new award to be known as the Army "A" award, which will be conferred upon war production plants and workers conspicuous for outstanding performance in Army production. The award will comprise an Army "A" flag for the manufacturing plant and a specially designed lapel button for each worker in that plant.

Quality and quantity of production in the light of available facilities will be the factors that will govern the board in selecting recipients for the awards. Other factors to be weighed: 1. Overcoming of production obstacles; 2. avoidance of stoppages; 3. maintenance of fair labor standards; 4. training of additional labor forces; 5. effective management; 6. record on accidents, health, sanitation, and plant protection; 7. utilization of subcontracting facilities.

Members of the board will include Lt. Gen. William S. Knudsen, director of production, chairman; Maj. Gen. C. M. Wesson, chief of ordnance; Brig. Gen. B. E. Meyers of the Air Forces; E. F. McGrady, special assistant to Under Secretary of War Patterson; A. R. Glancy of the procurement and distribution division, Services of Supply; and J. E. Harrell of the civilian personnel division, Services of Supply.

The Army "A" flag is of burgee design, similar in size and shape to the Navy "E" flag. It is of red wool bunting and bears the head, breast and shoulder of the American eagle in gold, on a blue field, framed in white circle. A large capital letter "A" in white is adjacent to the eagle. White stars, each five inches in diameter, will be in a vertical line parallel to and adjacent to the staff of the pennant to represent additional awards.

Subsequently the War and Navy Departments jointly announced another new award, the Army-Navy Star, to go to companies building machine tools and their accessories recognized for their contributions to the war effort.

Conferment of the joint award will give the company the right to fly a burgee type flag over its plant and employes the right to wear a new lapel button. The burgee is blue with a white star in the center. The names of the Army and Navy appear in large red letters, edged with a white piping.

Among the first recipients of the joint award were Cleveland Twist Drill Co. and National Acme Co., both of Cleveland, who were honored May 22.

National Forge Wins All-Navy "E" Burgee

National Forge & Ordnance Co., Irvine, Pa., has been awarded the All-Navy "E" burgee for excellence in production. Company was given the Navy's Bureau of Ordnance "E" last October. All-Navy "E" lapel pins have been distributed to all employes by John C. Harrington, company president, and replace the ordnance "E" pins the workers received last year.

National Bearings Metal Corp., St. Louis, was the fifth Navy producer in that city to win the Navy "E" burgee. Presentation was made recently by Rear Admiral William Carleton Watts.

Canada Spurs Ore Output by Subsidies; Control Over Steel Products Tightened

TORONTO, ONT.

PRODUCTION of iron ore now is an established factor in the Canadian mining industry and is expected to increase substantially as more mines are opened. New Helen mine, controlled by Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., located in northwestern Ontario, is in steady production under subsidy by the Canadian government. Opened in the latter part of 1939 this mine produced 121,000 gross tons that year; 407,063 tons in 1940, and 517,068 tons in 1941.

About 50 per cent of ore from this mine is used in Algoma Steel's blast furnaces, the remainder going to the United States on an exchange basis for American ore. By sintering, the low-grade ores from the Helen mine are brought to an average of 51.5 per cent iron.

Department of Munitions and Supply has ordered that no shipments of sheets, bars, plates of structural steel be made by mills without its authorization. This makes it impossible for consumers to obtain steel for other than war purposes.

Administrator of heating, plumbing and air conditioning equipment has ordered reduction from 1250 to 360 in varieties of cast iron soil pipe and fittings. Until Sept. 1 manufacturers may sell from stock on hand but after that date permission will be required. Protective coatings for soil pipe are restricted to two types, oil and tar.

New regulations being prepared by the Department of Munitions and Supply will curtail further the use of copper.

C. D. Howe, minister of munitions and supply, has announced that contracts awarded and commitments made by his department on Canadian, United Kingdom and other accounts from July 14, 1939, to April 30, 1942, totaled $4,082,727,233. Contracts placed on Canadian account, including plants and plant extensions, general purchases and contracts for $34,429,062 awarded for the Civil Aviation Division, amounted to $2,250,059,254. Aggregate of orders for stores placed on United Kingdom account, with United Kingdom commitments for plants, plant extensions and output of some of these plants, total $1,623,944,065. Contracts on other accounts totaled $208,723,914.

Mining Congress Opposes Cuts In Tariffs Beyond War Time

Opposition to reduction in tariffs on mineral imports beyond the duration of the war was voiced by Julian D. Conover, secretary, American Mining Congress, before the Committee on Reciprocity Information, now holding hearings on proposed trade agreements with Mexico and Bolivia.

The mining industries do not oppose the reduction or the complete lifting of tariff duties on metals during war time, Mr. Conover said. He urged, however, that any such curtailment of protection to the domestic industry be definitely limited and that the present rates become effective immediately at the close of the war.

Opposition to lowering import duties on tungsten was voiced by Josephus C. Trimble on behalf of the American Tungsten Association, San Francisco.

Mr. Trimble told the committee that a reduction in the tungsten tariff in the Bolivian agreement would not increase the supply to the United States, would not help Bolivia at the present time, would be unfair to American investors and would cause many miners to be thrown out of work when the war is over.

Industrial Salvage Section Calls for Reports on Scrap

WASHINGTON

Industrial Salvage Section, in WPB's Bureau of Industrial Conservation, is distributing report blanks, printed in the form of self-addressed post cards, to set forth movement and disposal of scrap materials. Blanks are being distributed by BIC's regional offices which hopes eventually to place them in the hands of salvage managers of all American manufacturers.

BIC reported last week that in the two-week period ended April 30 salvage of 393,531 tons of scrap was reported, bringing the total for the year to 1,000,000 tons. Nearly 4000 individual reports on this have been received in Washington and as industrial center operations improve the number of reports received is increasing. Industrial center operations are being organized in every area in the country and 170 units already are functioning.

Industrial center operations are formed with top executives in each industry in each area comprising a steering committee, the duty of which is to organize a salvage program for every plant in the area. Some 3000 committeemen already are co-operating with the WPB salvage unit.

OPA Alleges Pittsburgh Scrap Price Violations

Office of Price Administration last week obtained restraining orders in federal court at Pittsburgh against Jones & Laughlin Steel Corp. and Allegheny Ludlum Steel Corp. on charges that they violated the scrap ceiling price order. Restrainers were issued by the court against three scrap dealers, Glosser & Sons, Johnstown, Pa., Staiman Bros., Williamsport, Pa. and Hodes Coal & Junk Co., Lock Haven, Pa., on charges of selling upgraded and top-dressed scrap. Answers must be filed by May 29.

Illinois Central Reports Savings of Critical Metals

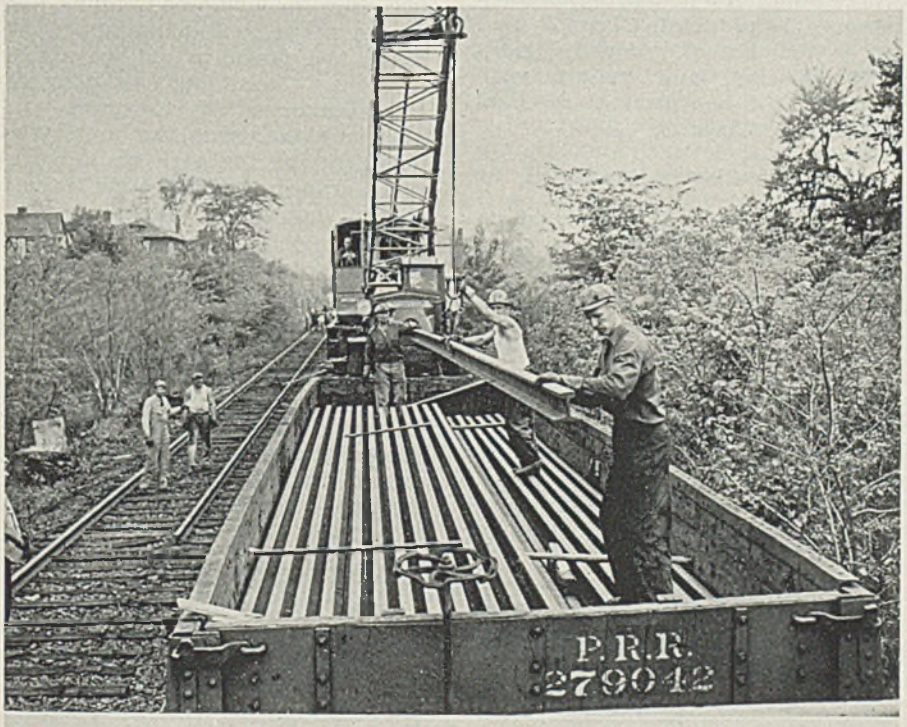
Illinois Central railroad, Chicago, last week reported progress in conversion and substitution of materials and in making scrap available for war uses.

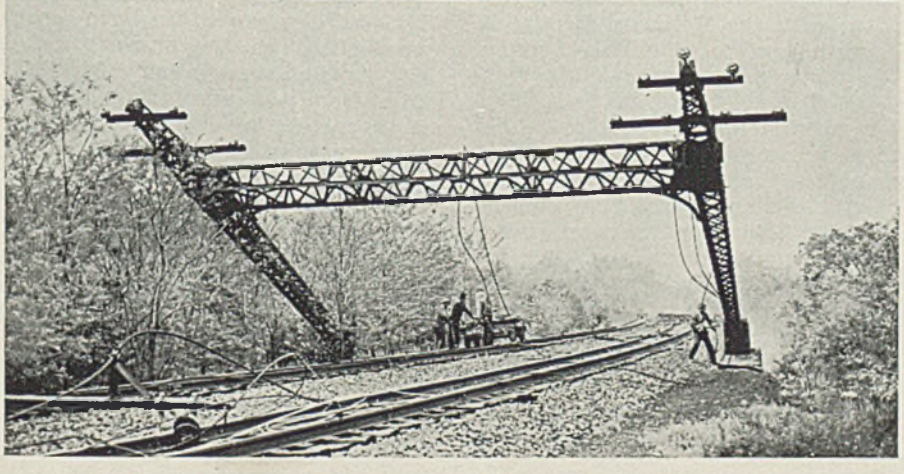
During first quarter, 1942, a drive resulted in accumulation of approximately 25 per cent more scrap than in the same period of 1941. Estimated annual savings of metal, based on 1941 consumption, are 62,000 pounds of copper, 5600 pounds of tin, 6800 pounds of lead, 3400 pounds of nickel and 2740 pounds of other metals.

Reclaimed lead will be used instead of some 20,000 pounds of new lead, annually, for counter-balancing locomotive driving wheels. Other changes call for wood instead of aluminum patterns, dispensing with aluminum paint, using asphalt and tar paper for gaskets where practical, using wrought iron or steel in place of copper tubing, and using cast iron malleable iron instead of brass.

Points to Need for Modernizing Equipment

Declaring that railroads are making a tremendous contribution to wartime efforts without benefit of modern equipment, B. B. Williams, president, Cooper-Bessemer Corp., Mt. Vernon, O., stated last week that need for an extensive program of replacement is clearly indicated. He pointed out that over 43 per cent of the freight locomotives are between 20 and 30 years old and another 25 per cent are over 30.





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Defunct Railroad Goes to War

DEFUNCT New York, Westchester & Boston railway recently reached the end of the line when the War Department bought the road for $423,000 for the 15,000 tons of scrap that will be salvaged from its 70 miles of rails, 482 towers, and 30 bridges. Demolition already is under way. Above, a wrecking crew loads sections of the track onto a gondola car for shipment to war production plants. Below, a catenary bridge, which straddled the track to support its power lines, is toppled.

NEA photos

Freezing of Wages by Classification

"More Equitable," Metal Trades Told

NEW YORK

INSTALLED in approximately 325 plants, the job rating plan of the National Metal Trades Association, evaluating shop operations for maintaining wage scales consistent with those of the community, is meeting with encouraging success. Accepted in many instances by organized labor as a basis for collective bargaining, the impartiality with which it has been applied was emphasized at the forty-fourth annual convention of the association here last week.

Job-rated plants cover more than 25,000 occupations, A. H. Timmerman, Wagner Electric Corp., St. Louis, pointed out in his presidential report. While job rating is essential now, it assumes even greater importance when and if a wage-freezing order is issued. Mr. Timmerman suggested "freezing by classification" as more equitable than the freezing of each person's wage or salary. Freezing as of a certain date will not be workable unless employes also are frozen to their jobs. Said Mr. Timmerman:

"For more than 40 years our association has stood firmly for the principle that those who manage industry and who are obligated to make those industries produce efficiently must be free to employ the best workmen available without regard to whether those workmen pay tribute to labor union leaders.

Decries Labor Dictation

"I do not subscribe to the theory that our war productive effort can be increased by unionization of the industries. Neither do I believe that any employe should be frustrated in his effort to produce what is necessary to save our country, by the dictates of any labor union or any labor union boss, nor that men in the armed services of this country should be restricted to union-made bullets. I further do not believe that Congress, when it enacted that section of the Selective Service Act that guaranteed the discharge service man his prior position in private employment, contemplated delivering the right to those jobs into the hands of a labor union to be parceled out through a closed shop barrier.

"There is no group of industries in America that is more vital, and there is no group as dependable for the production of the necessities of war as the metal trades industry. The industry has always risen to any emergency and will continue to do so, just so long as it remains free to do its job—to produce what the nation requires."

Junior executive, foreman, instructor and specialist training for national production was a subject for panel discussion. When the Universal Winding Co., Providence, R. I., undertook production of automatic rifles, an entirely new product entailing scores of new operations, including broaching, much of the load in design, shop layout and planning was assumed by advanced groups in training, this company maintaining three classes. One is composed of student engineers, college graduates with degrees in mechanical engineering, Class A; a second made up of men drawn from the plant, ambitiously inclined, but apparently advanced to a point where additional instruction and experience is required, Class B; and third, high school graduates, carefully selected, and mainly with trade school background, mechanically bent, Class C.

Training Classes Successful

Various courses of study and instruction are assigned all groups, training for Class A being completed in 4000 hours; Class B, 6000 hours; Class C, 8000 hours, the company awarding a bonus to the latter on completion of the course, which covers cost of tuition during apprenticeship. William A. Ruhl, works manager, reported that only two taken for Class C had dropped out after a short probationary period. Graduates from that division are developing into valuable machinists and toolmakers. The high school class of apprentices, under supervision, practically operates tool room activities.

Training of instructors for machine operations has taken a key place with the Reliance Electric & Engineering Co., Cleveland, manufacturer of motors. With hundreds of new employes, S. B. Taylor, works manager, found foremen becoming overloaded. Foremen have been "sold" on the idea of training and appointing instructors for their departments, and a co-ordinator has been appointed for the whole program of instructor training, selections being made mainly from older and regular employes. These employes naturally know the work, but many need training in the ability to teach others. On many shop operations training periods for new employes are one-fourth of the time formerly considered necessary to teach a new employe the job.

In training foremen best results are attained with groups of 10 to 15 with approximately equal plant authority, according to William L. Dolle, president, Lodge & Shipley Machine Tool Co., Cincinnati. Mr. Dolle outlined the program sponsored by the association. He favors reference to such foreman programs as conferences, rather than training sessions. Conference leaders should be selected from among foremen and regular hours for meetings should be observed, generally on company time. Management heads should attend, briefly advising of new contracts and policy, and minutes of conference should be kept.

Training of junior executives has been neglected, but the future will force such programs in industry, Paul E. Heckel, assistant executive, Cincinnati Bickford Tool Co., stated. Too many have inherited executive positions. Men are being trained too often for advanced thinking, and at the same time handicapped by being tied down to old ways and methods. Classifying executives as the administrative, executive and policy-making types, he urged the qualifications for each be as carefully graded, selected and trained as for shop requirements.

The aircraft industry next year will be called upon to deliver engines totaling 200,000,000 horsepower. This, according to J. Carlton Ward Jr., president, Fairchild Engine & Airplane Corp., New York, is more horsepower than all the utilities of the country can deliver. All the locomotives in the nation cannot produce that much, he said. Such power could drive 2000 modern battleships.

Airplane Output Double Axis'

More airplanes have been produced in the United States in the last 12 months than were built here in the 35 years following the Wrights' first flight at Kitty Hawk. Mr. Ward deplored the term "mass production" in the aircraft industry, saying the aviation engine differs from the automobile in that it operates in three dimensions, temperatures ranging from 50 degrees below zero to desert heat, with air pressures changing rapidly, all having intricate effect on design.

In round figures he estimated Allied Nations' production of all planes nearly twice that of the Axis countries at this time. To maintain 10,000 planes on the battle line, probably 100,000 would be required in various services and supply.

Need of high octane fuel alone may reach 100,000 barrels daily, much of which has to be transported great distances.

Mr. Ward stated 35 per cent of all current United States war output is in aircraft and related products. He estimated plane production for 1942 at or above $9,000,000,000, or double the value of automobile production in any year—compared with $1,500,000,000 in 1941. He predicted that employment in the industry, now 400,000, will go above 1,000,000 in 1943, with a constantly increasing percentage of women workers.

He indicated the automobile industry first took the wrong approach to aircraft production, but it has been elastic and about 12 per cent of the total production is now being contributed by the automobile industry; also the nation was slow to build up the aircraft industry in terms of contracts, even after Hitler went into Poland.

There are 20,000 women employed in aircraft assembly and the number may run into the hundreds of thousands. Women are proving of real value in aircraft assembly and are accomplishing far more than was predicted.

War Basis of Labor-Management

Set-up and operation of War Production Board joint labor-management committees were described by George A. Seyler, vice president, The Lunkenheimer Co., Cincinnati, and John B. Goss, director of planning, Scovill Mfg. Co., Waterbury, Conn.

At the Lunkenheimer Co. plant organization was accomplished in co-operation with the union sub-regional director, with the understanding the productive drive committee was created for the sole purpose of intensifying war output. All questions are to be approached on this basis: "Will they help to win the war?" Activities, functions and meetings are separate from those of negotiation and grievance committees. Seven rules covering these points were drawn.

Production drive matters are handled by 15 committees, a clearance committee having sub-divisions covering absence, bulletins and posters, destruction of property, sabotage and plant protection, eye protection and wearing apparel, housekeeping and fire protection, on time—tardiness, quality, quotas and production, safety, maintenance and repair, slogans and contests, suggestion boxes, tool and equipment care, upgrading and training and waste. The program is working satisfactorily, Mr. Seyler outlining details of the operations and functions of various sub-committees. Total committee memberships include 49 from the union and an equal number from management. Weekly reports of the committee, signed by employes are forwarded to the War Production Board.

At the Scovill plant each department with 10 or more employes has a committee of at least three and not more than nine, the employes being drafted by themselves, by selecting names from a hat. Qualified employes are selected from company payroll records, a room of 100 employes being entitled to three committee members with two added for each additional 200 or part thereof. Ratio of men to women is maintained as near the actual ratio existing in employment as possible. A committee once set up remains in office for four months when some of the committee are dropped in order which they were originally drawn, being replaced by others drafted by the employes.

Wage negotiations without a factual basis become horse-trading, according to C. J. Uhlir, director of industrial relations of the association.

He favored the establishment of minimum rates based on minimum rates in the community. If a company cannot meet these rates its management is in a vulnerable position in wage negotiations. Job rating is a management function, but Mr. Uhlir advocates union or employe access to ratings for review and discussion. Job evaluation or compensation should be divorced from actual process of job rating. Assuming the jobs are equal, Mr. Uhlir favors equal pay for women with men, but conversion of many plants from production of civilian products to war goods tends to limit the fairness of some former work incentive policies.

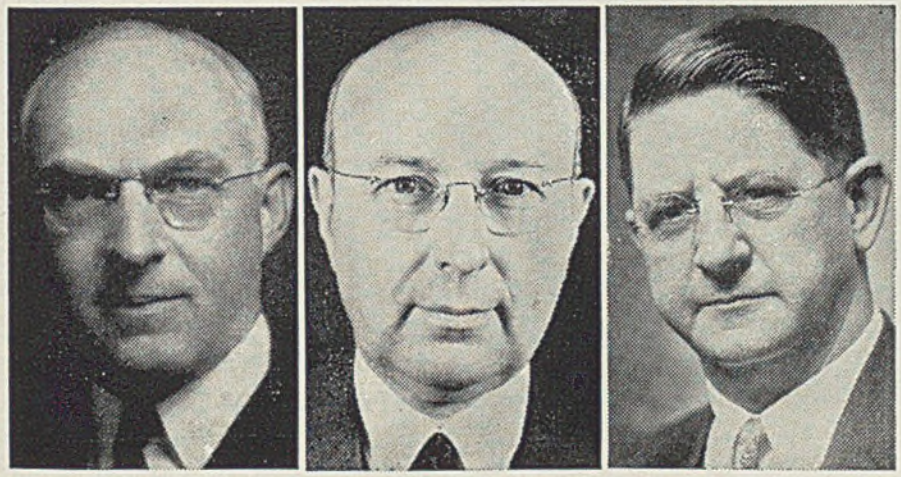
Welding has contributed much to speed in ship building, and the American two-ocean navy will be completed well ahead of the original 1947 date, said Frank Folsom, assistant chief of navy procurement, speaking at the annual dinner. Modern naval warfare, especially the increased use of torpedoes and bombs, has greatly complicated naval design and steel ship construction, he said.

Officers Are Chosen

Roe S. Clark, Package Machinery Co., Springfield, Mass., was elected president; H. H. Kerr, Boston Gear Works Inc., North Quincy, Mass., first vice president, and Mr. Seyler second vice president and treasurer. Membership during the year made a net gain of 59, to 891 from 832.

Association councilors elected for two years are: A. R. Welton, Holtzer-Cabot Electric Co., Boston; Wallace E. Frohock, M. S. Little Mfg. Co., Hartford, Conn.; Floyd Newton, G & O Mfg. Co., New Haven, Conn.; Joseph L. Kopf, Jabez Burns & Sons Inc., New York; P. J. Potter, Pangborn Corp., Hagerstown, Md.; Edwin B. Hausfeld, Ohio Pattern Wks. Fdy. Co., Cincinnati; R. W. Gillispie, Jeffrey Mfg. Co., Columbus; S. B. Taylor, Reliance Electric & Engineering Co, Cleveland; Mason B. Jones, S. M. Jones Co., Toledo; S. Owen Livingston, Gallmeyer & Livingston Co., Grand Rapids, Mich.; R. G. Wilson, Challenge Machinery Co., Grand Haven, Mich.; Walter F. Newhouse, Saranac Machine Co., Benton Harbor, Mich.; Howard Goodman, Goodman Mfg. Co., Chicago; D. P. Sommer, Keystone Steel & Wire Co., Peoria, Ill.; Ernest Dunford, Landis Machine Co., St. Louis; John Brown, Chain Belt Co., Milwaukee; A. H. Timmerman, Wagner Electric Corp., St. Louis.

Elected by National Metal Trades Association



Roe S. Clark
President

H. H. Kerr
First Vice President

George A. Seyler
Second Vice President and Treasurer

USA-CIO, Formerly SWOC, To Press Wage Demand; Claims 660,000 Members

INSISTENCE upon the granting of $1 a day wage increase by "Little Steel" companies was voiced last week at the constitutional convention of the United Steelworkers of America, formerly the Steel Workers Organizing Committee, in Cleveland. The wage increase demand is now pending before the National War Labor Board.

CIO President Philip Murray upheld the union's demand for wage increases in the steel industry and opposed any move to freeze wages on the ground that such action would tend to destroy unionism. He favored, however, the waiver of premium rates for weekend work within the basic 40-hour week. Mr. Murray said representatives of the CIO had agreed to the waiver at President Roosevelt's request.

"Organized labor did it and didn't beef about it . . . didn't gripe," the CIO leader said. "We stood up and voted unanimously to support the President of the United States."

One of the first actions of the union was to change its name from the organizing committee to the United Steelworkers of America. By using "steelworkers" as one word they achieved the initials USA-CIO, a patriotic angle upon which the union will undoubtedly capitalize.

A report by the union's officers claimed:

Membership, 660,052.

Under contract, 903 steel manufacturing, fabricating and processing plants.

Active locals, 1119.

Recognition as bargaining agent for 90 per cent of the industry.

Wage increases obtained to the point where the lowest paid workman receives the earnings of the average steelworker in 1936.

Checkoff contracts, 204.

Maintenance of membership contracts, 47.

Union shop contracts, 175.

The financial report said initiation fees were $3; membership dues, $1 a month, with no assessments or fines; peak dues collections, in November, 1941, of $548,357. The officers said $601,000 which had been borrowed from the United Mine Workers has been repaid, eliminating all indebtedness to that union.

The union also claimed that 153,000 workers have been organized in the plants of Republic Steel Corp., Bethlehem Steel Co., Inland Steel Co. and Youngstown Sheet & Tube Co., the four independents involved in the pending controversy before the WLB.

Regional Directors Clinton S. Golden and Van A. Bittner asserted that before the next convention the union would have organized the workers in Weirton Steel Co. and American Rolling Mill Co.

"We're going to settle that even before we lick Hitler," said Bittner.

Resolutions adopted by the convention pledged support to the WPB and urged adoption of the Murray industrial council plan; recommended to the CIO extension of co-operation and collaboration with the American Federation of Labor on all issues to further the cause of labor and the war effort; pledged the union to redouble efforts to organize the steel industry.

The union also expressed gratitude to the United Mine Workers, headed by John L. Lewis, for the latter's loan of leaders and resources during the steelworkers' organizational phase and extended "friendship and loyalty" to cement unity between the two unions and other CIO affiliates. At the same time observers were predicting an early showdown between Lewis and Murray, now at odds over national and union policies.

At Detroit, members of the United Automobile Workers fired a broadside at Lewis in which they told him what they did "not like" about him (see page 52).

Incidentally the UAW apparently has let itself in for a little difficulty by making new demands, including wage increases, against Ford Motor Co. Spokesmen for the latter indicated that if the demands were pressed the company might cancel checkoff provisions in its contract with the union.

Bicycle Solution to Transportation Problem?

FOUR bicycle parking sheds have been erected at a midwestern plant of the General Electric Co. to accommodate the vehicles of workers who cycle to their jobs. Other divisions of the company are following suit. Company reports a sharp increase in cycling employes as the automobile tire shortage grows more acute and gasoline rationing spreads

Wildcat Strike Costs War Effort 40,000 Tons of Coal

Week-old strike by 1600 miners in the Clarksville and Fredericktown, Pa., mines of Republic Steel Corp. ended last week when company and union officials met to discuss the grievances. Company officials estimated the unauthorized walkout cost the war effort 40,000 tons of coal and 27,000 tons of coke. Strike was caused by shotfirers refusing to carry dynamite into the mines. The strikers contended extra men should be hired to do this job.

Bargaining Election Ordered At Pressed Steel Car Plant

National Labor Relations Board last week ordered a collective bargaining election within 30 days at Pressed Steel Car Co., McKees Rocks, Pa.

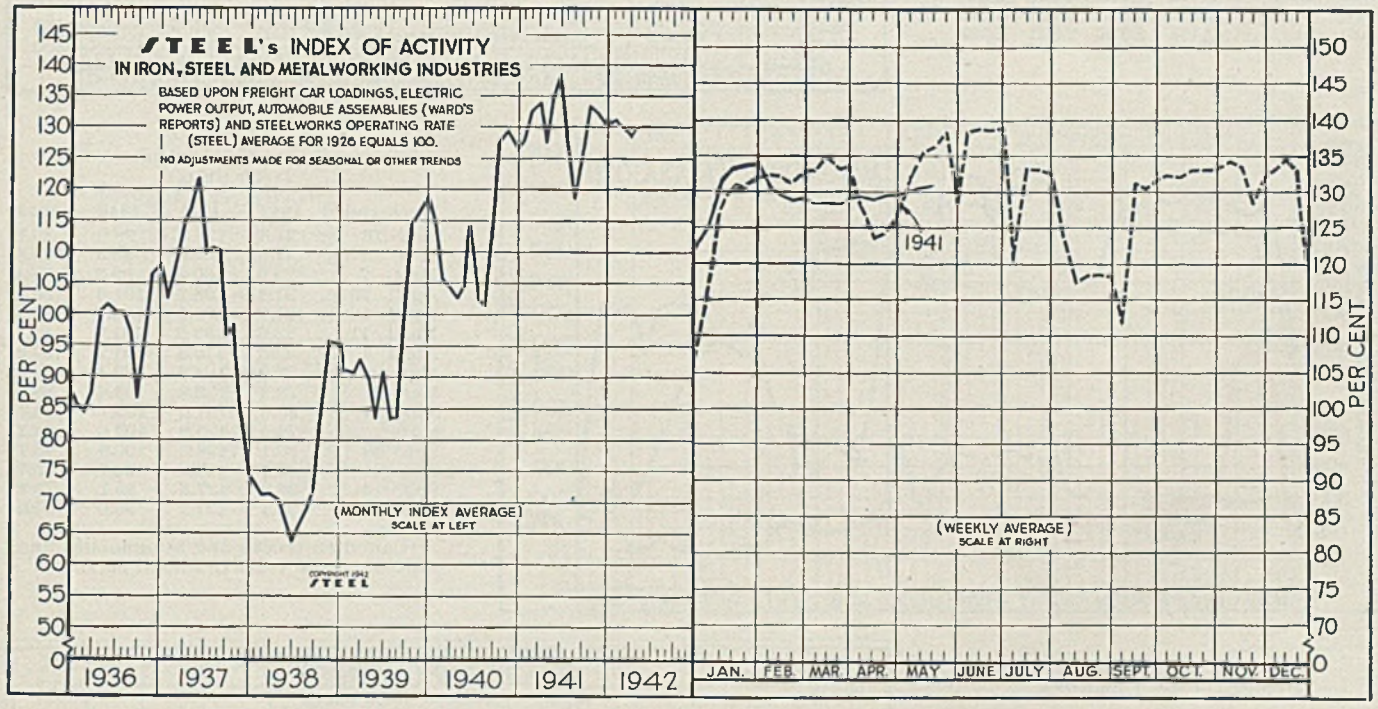
The BUSINESS TREND

Consumption of Basic War Supplies Rising Steadily

CONSUMPTION of war materials will be so great by fall that shortages of basic war supplies may develop. As a result it may be impossible to convert all of the country's plants to war work. Because of this, plans calling for building new plants and further conversion of peacetime facilities are being revised. Indications are that in the immediate months ahead efforts will be concentrated on utilizing what facilities are at hand now.

During the week ended May 16, STEEL's index of activity in the iron, steel and metalworking industries stood at 130.7. The index has been on a plateau around the 130 level for some weeks.

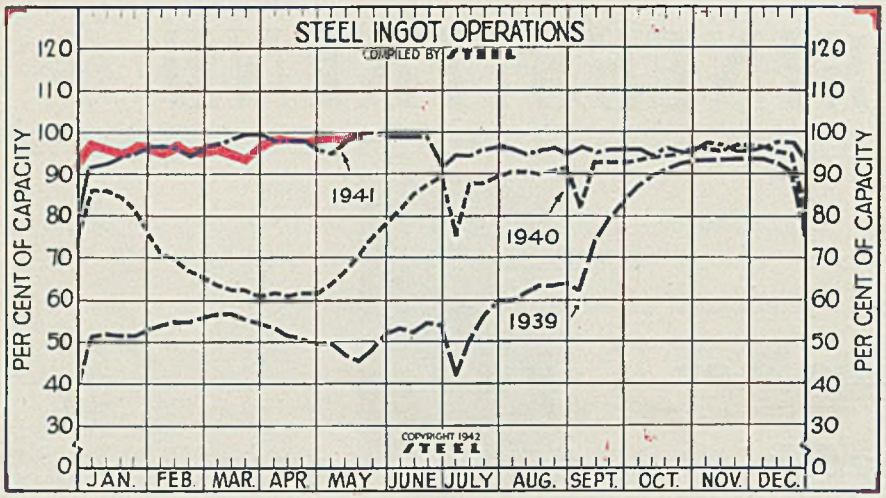
Steel ingot production reached an all-time record during the week of May 16. Percentagewise steel output climbed one-half point to 99.5 per cent of capacity during that week. In the same period a year ago the national steel rate also stood at 99.5 per cent, but on a tonnage basis output was substantially below the current volume. Electric power consumption rose to 3,356,921,000 kilowatts during the latest period.



STEEL'S index of activity advanced 0.3 *point to* 130.7 *in the week ended May* 16:

Week Ended	1942	1941
Feb. 28	129.1	133.0
Mar. 7	128.3	133.1
Mar. 14	128.3	135.0
Mar. 21	128.1	133.5
Mar. 28	129.1	133.9
April 4	129.6	128.9
April 11	129.2	123.8
April 18	129.4	124.2
April 25	129.3	126.5
May 2	130.0	132.6
May 9	130.4	135.9
May 16	130.7	136.1

Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Jan.	131.3	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1
Feb.	129.6	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5
March	128.6	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
April	129.5	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0
May	.....	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6
June	.....	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
July	.....	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
Aug.	.....	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
Sept.	.....	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Oct.	.....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
Nov.	.....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
Dec.	.....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3



Steel Ingot Operations

(Per Cent)

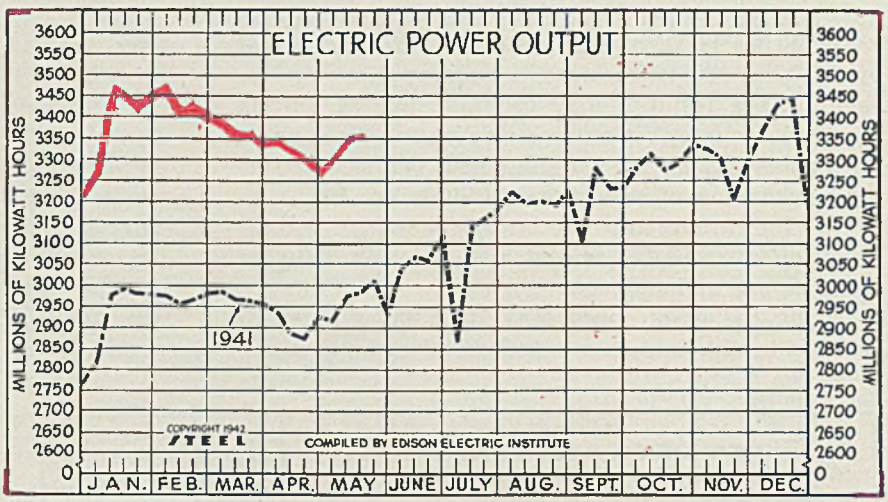
Week ended	1942	1941	1940	1939
May 16	99.5	99.5	70.0	45.5
May 9	99.0	97.5	66.5	47.0
May 2	99.0	95.0	63.5	49.0
April 25	98.5	96.0	61.5	49.0
April 18	98.5	98.0	61.5	50.5
April 11	98.5	98.0	61.0	51.5
April 4	98.0	98.0	61.5	53.5
Mar. 28	97.5	99.5	61.0	54.5
Mar. 21	95.5	99.5	62.5	55.5
Mar. 14	95.5	98.5	62.5	56.5
Mar. 7	96.5	97.5	63.5	56.5
Feb. 28	96.0	96.5	65.5	56.0
Feb. 21	96.0†	94.5	67.0	55.0
Feb. 14	97.0	96.5	69.0	55.0
Feb. 7	96.0	97.0	71.0	54.0

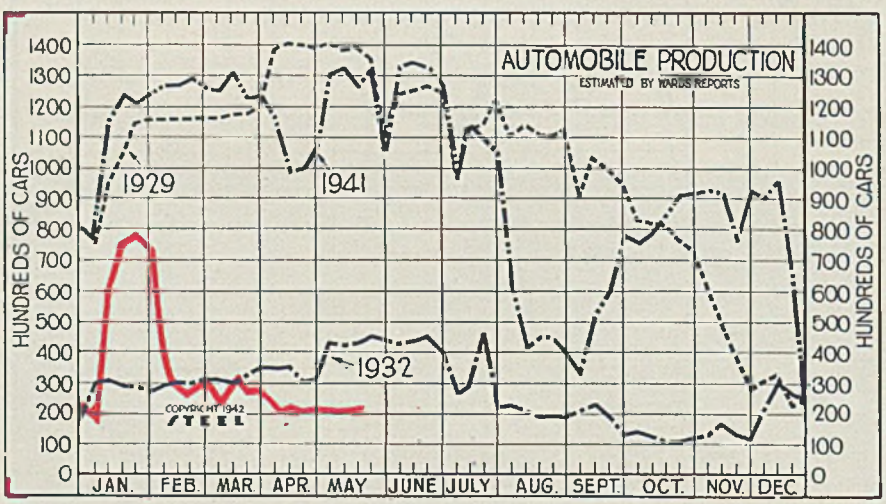
†Since Feb. 21 rate is based on new capacity figures as of Dec. 31 last.

Electric Power Output

(Million KWH)

Week ended	1942	1941	1940	1939
May 16	3,357	2,983	2,550	2,235
May 9	3,351	2,975	2,516	2,239
May 2	3,305	2,915	2,504	2,225
April 25	3,299	2,926	2,499	2,244
April 18	3,308	2,874	2,529	2,265
April 11	3,321	2,882	2,530	2,235
April 4	3,349	2,938	2,494	2,244
Mar. 28	3,346	2,956	2,524	2,272
Mar. 21	3,357	2,964	2,508	2,258
Mar. 14	3,357	2,965	2,550	2,276
Mar. 7	3,392	2,987	2,553	2,285
Feb. 28	3,410	2,982	2,568	2,294
Feb. 21	3,424	2,968	2,547	2,269
Feb. 14	3,422	2,959	2,565	2,297
Feb. 7	3,475	2,973	2,616	2,315
Jan. 31	2,468	2,978	2,633	2,327





Auto Production

(1000 Units)

Week ended	1942	1941	1940	1939
May 16	21.8	127.3	99.0	80.1
May 9	21.5	132.6	98.5	72.4
May 2	22.0	130.6	99.3	71.4
April 25	21.9	108.2	101.4	86.6
April 18	21.7	99.9	103.7	90.3
April 11	23.0	99.3	101.9	88.1
April 4	22.3	116.3	101.7	87.0
Mar. 28	28.9	124.2	103.4	86.0
Mar. 21	28.9	123.8	103.4	89.4
Mar. 14	30.6	131.6	105.7	86.7
Mar. 7	24.5	125.9	103.6	84.1
Feb. 28	30.1	126.6	100.9	78.7
Feb. 21	25.7†	129.2	102.7	75.7
Feb. 14	29.8	127.5	95.1	79.9
Feb. 7	37.1	127.7	96.0	84.5

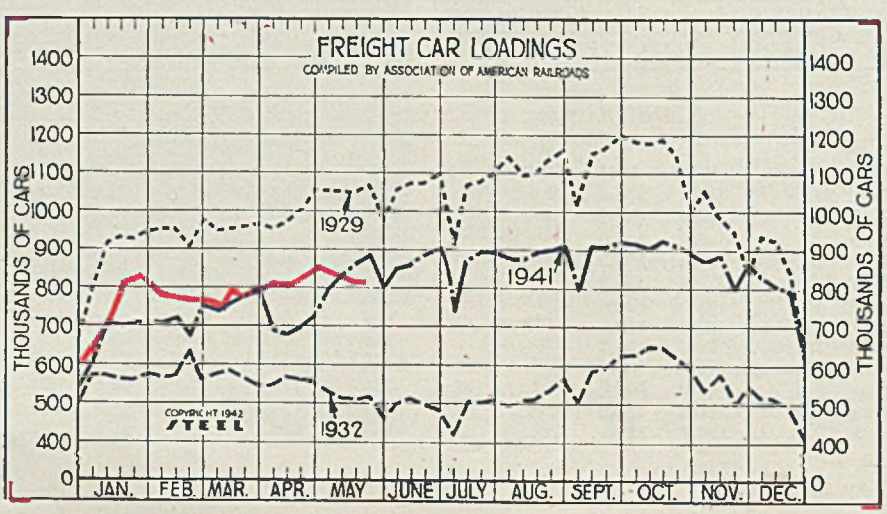
†Canadian trucks and automobiles and United States trucks, since Feb. 21.

Freight Car Loadings

(1000 Cars)

Week ended	1942	1941	1940	1939
May 16	839	861	679	616
May 9	839†	837	681	555
May 2	859	794	666	573
April 25	855	722	645	586
April 18	847	709	628	559
April 11	814	680	619	548
April 4	829	683	603	535
Mar. 28	805	792	628	604
Mar. 21	797	769	620	605
Mar. 14	799	759	619	595
Mar. 7	771	742	621	592
Feb. 28	781	757	634	599
Feb. 21	775	678	595	561
Feb. 14	783	721	608	580

†Revised.

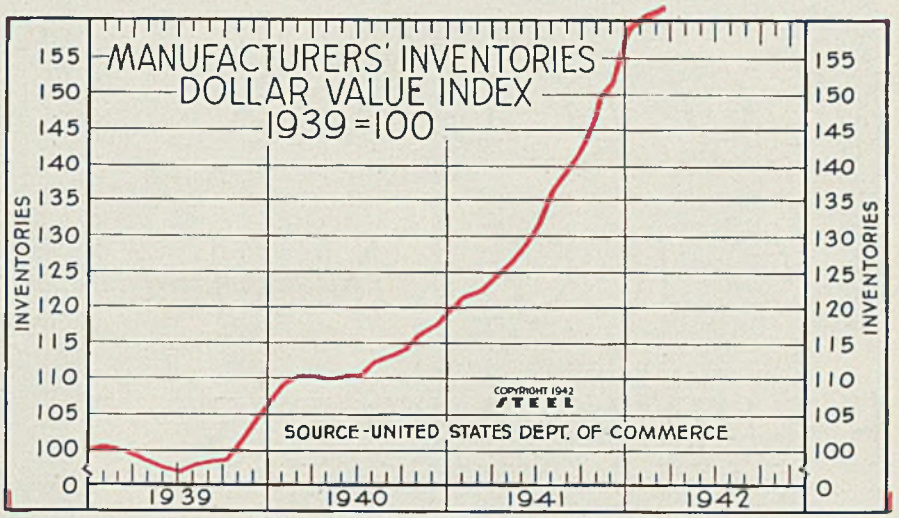


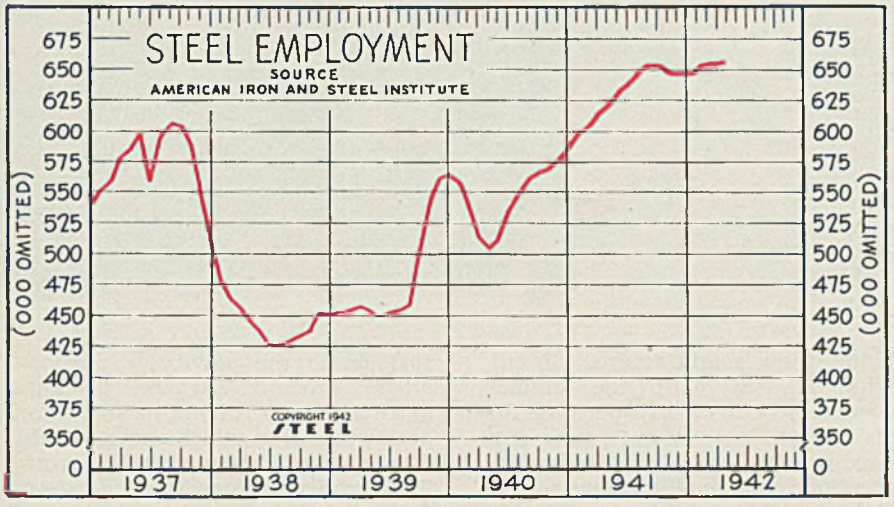
Manufacturers' Inventories

Dollar Value Index

1939 = 100

	1942	1941	1940	1939
Jan.	161.9	121.8	109.5	100.9
Feb.	163.1	122.7	110.6	100.4
March	.....	124.1	110.5	99.5
April	.....	126.0	110.0	98.5
May	.....	128.7	110.5	97.9
June	.....	132.0	110.6	97.4
July	.....	136.4	112.2	98.1
Aug.	.....	140.0	113.3	98.8
Sept.	.....	143.4	114.1	98.9
Oct.	.....	148.3	116.2	101.3
Nov.	.....	152.7	117.7	104.5
Dec.	.....	158.5	119.9	107.2
Mo. Ave.	.....	136.2	113.0	109.3





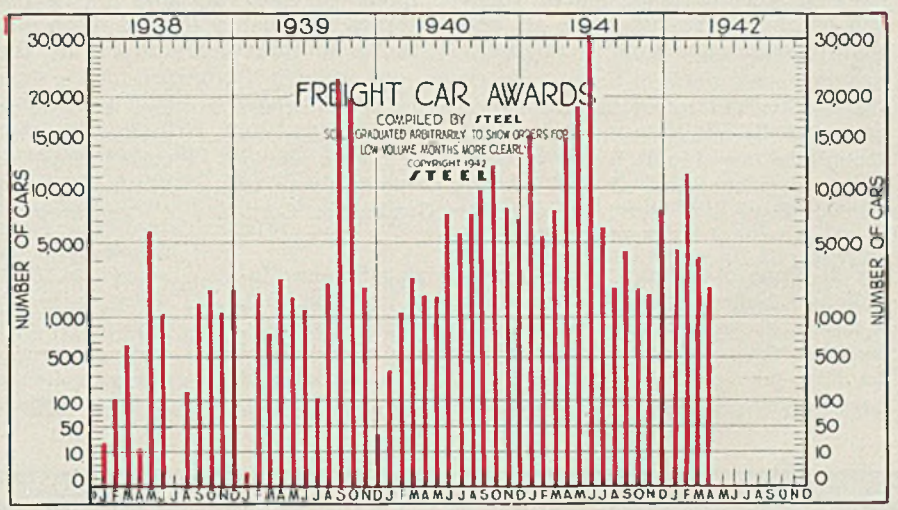
Steel Employment

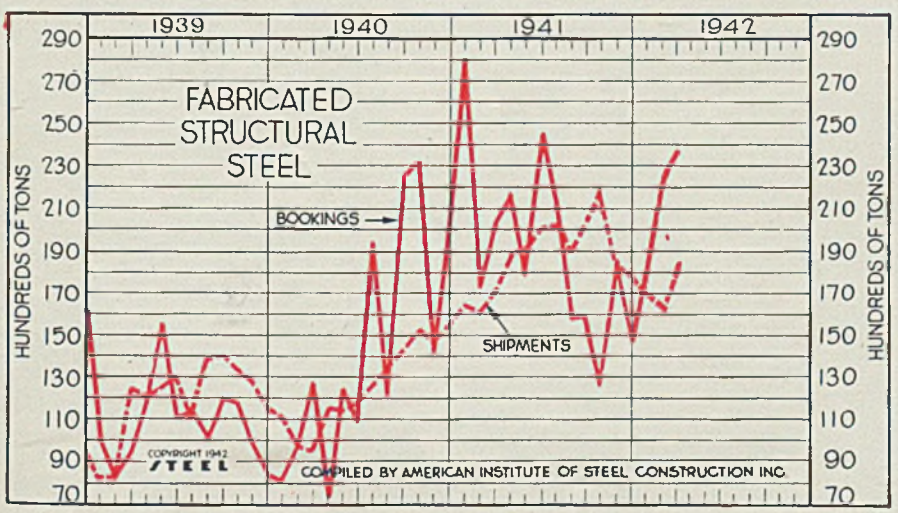
(000 omitted)

	1942	1941	1940	1939	1938
Jan.	651	598	556	451	475
Feb.	651	603	538	453	461
Mar.	653	613	514	455	455
Apr.	...	621	503	452	445
May	...	632	510	448	436
June	...	638	535	451	425
July	...	648	549	453	424
Aug.	...	654	560	458	427
Sept.	...	652	565	502	431
Oct.	...	646	568	545	436
Nov.	...	645	577	561	450
Dec.	...	646	585	563	449

Freight Car Awards

	1942	1941	1940	1939
Jan.	4,253	15,169	360	3
Feb.	11,725	5,508	1,147	2,259
March	4,080	8,074	3,104	800
April	2,125	14,645	2,077	3,095
4 mos.	22,183	43,386	6,688	6,157
May	.....	18,630	2,010	2,051
June	.....	32,749	7,475	1,324
July	.....	6,459	5,846	110
Aug.	.....	2,668	7,525	2,814
Sept.	.....	4,470	9,735	23,000
Oct.	.....	2,499	12,195	19,634
Nov.	.....	2,222	8,234	2,650
Dec.	.....	8,406	7,181	35
Total	.....	121,499	66,889	57,775





Fabricated Structural Steel

(1000 tons)

	Shipments			Bookings		
	1942	1941	1940	1942	1941	1940
Jan.	166.2	164.6	110.9	181.8	281.2	81.7
Feb.	162.0	161.4	97.2	227.0	173.6	98.9
Mar.	184.7	170.2	95.9	236.8	206.1	128.3
Apr.	....	189.8	116.3	....	218.0	73.8
May	....	191.9	115.6	....	179.9	126.8
June	....	200.5	119.1	....	246.9	109.7
July	....	203.0	127.1	....	214.8	194.9
Aug.	....	189.3	134.9	....	158.7	122.5
Sept.	....	204.1	142.8	....	158.8	225.5
Oct.	....	217.7	153.2	....	128.7	233.1
Nov.	....	182.6	147.0	....	184.0	141.9
Dec.	....	176.1	155.5	....	146.4	203.1
Tot.	....	2251.1	1515.5	....	2297.0	1748.1

MODERN FORGING FURNACES

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University Station, Va.
And
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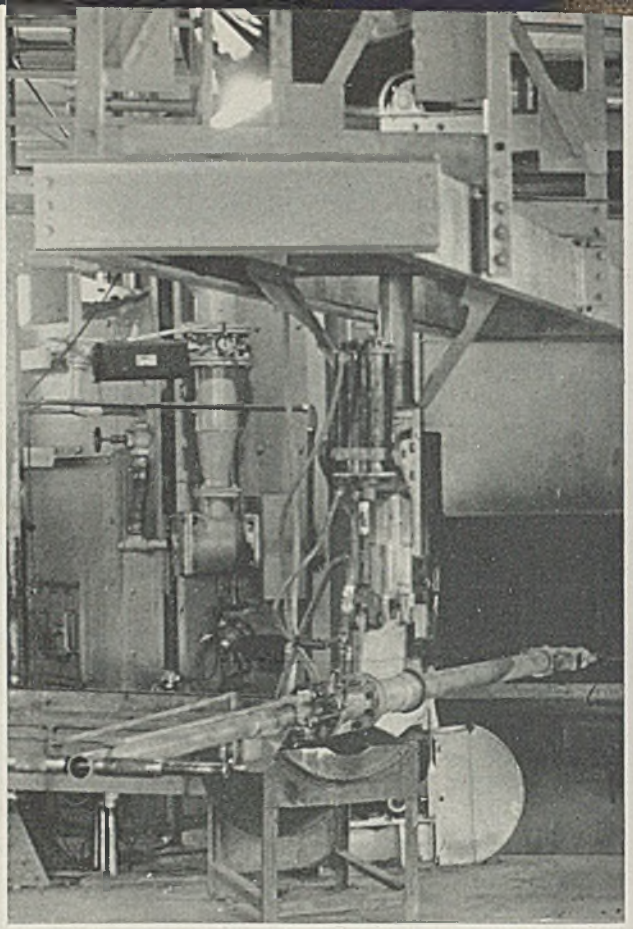
Section IX in a Series on Forgings, Forging Methods and Forging Equipment



THE FORGING press is widely recognized as an important tool in the manufacture of munitions of war; but its humble auxiliary, the furnace, is seldom in the spotlight. Yet few highly stressed steel parts of plane, tank, gun or shell have not made its acquaintance, at one time or another, during their manufacture. Familiarity, at least with the simpler types, may be in part responsible for this lack of notice; but many furnaces are no longer simple in construction, and inefficiency is definitely on the way out. One observes a tendency toward more and more complex adaptations of the furnace to the particular purpose.

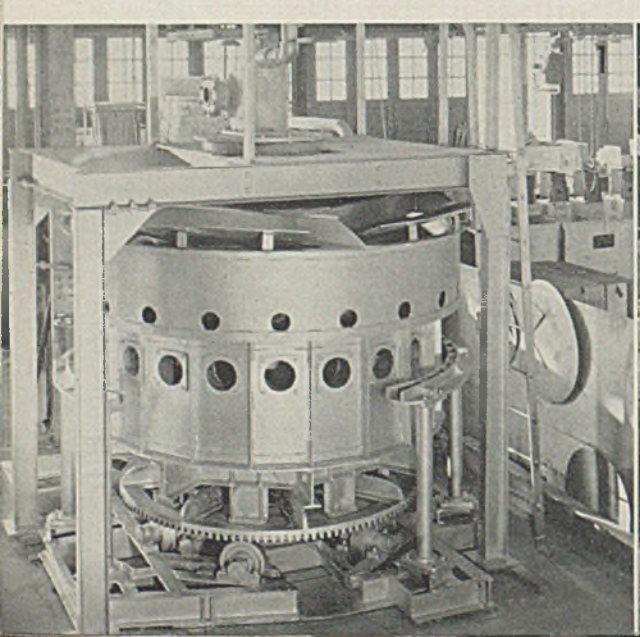
The modern furnace partakes more and more of the nature of an accurate tool in which energy in the form of heat is fed into the work. This involves controlling the rate of flow; directing the heat to some particular section, perhaps; establishing non-oxidizing atmospheric con-

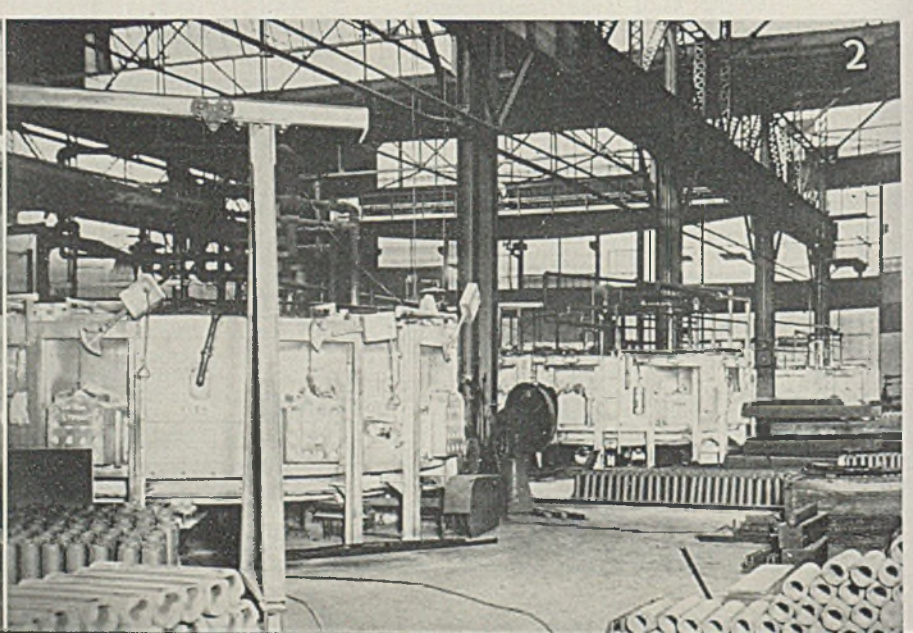
Fig. 1—Gas-fired rotary furnace designed to heat just the nose of shells which are inserted part way into the furnace through the row of large holes. Projectiles then go to nosing press where open end of shell body is partially closed or pointed. Figs. 1, 4, 5 and 6 are Surface Combustion Corp. photos

Fig. 2—Three of the nine rotary-hearth forging furnaces installed in National Steel Car Co.'s plant at Hamilton, Ont. In most of these units, the first zone is controlled manually, the other zones being equipped with automatic controls of the Rayo-tube or thermocouple type. Arch and hearth of these furnaces is made of a special tile known as "Mizzou". Chicago Flexible Shaft Co. photo

Fig. 4.—This gas-fired rotary furnace has automatic temperature controls for both forging and hardening. Water-cooled lintel provides heat cut-off. This unit has same heating capacity as three or four batch furnaces, each with an area of 2 x 5.5 feet, yet occupies 11 square feet

Fig. 5—With a capacity of 1800 pounds of stock per hour heated to 2600 degrees Fahr., this furnace has burners which make it possible to burn both gas and oil simultaneously. Half the burners are controlled by the operator and use a rich mixture of oil and city gas. Other burners are controlled automatically, using gas only. Unit is said to have longer furnace lining life, to increase forging die life because of diminished scale





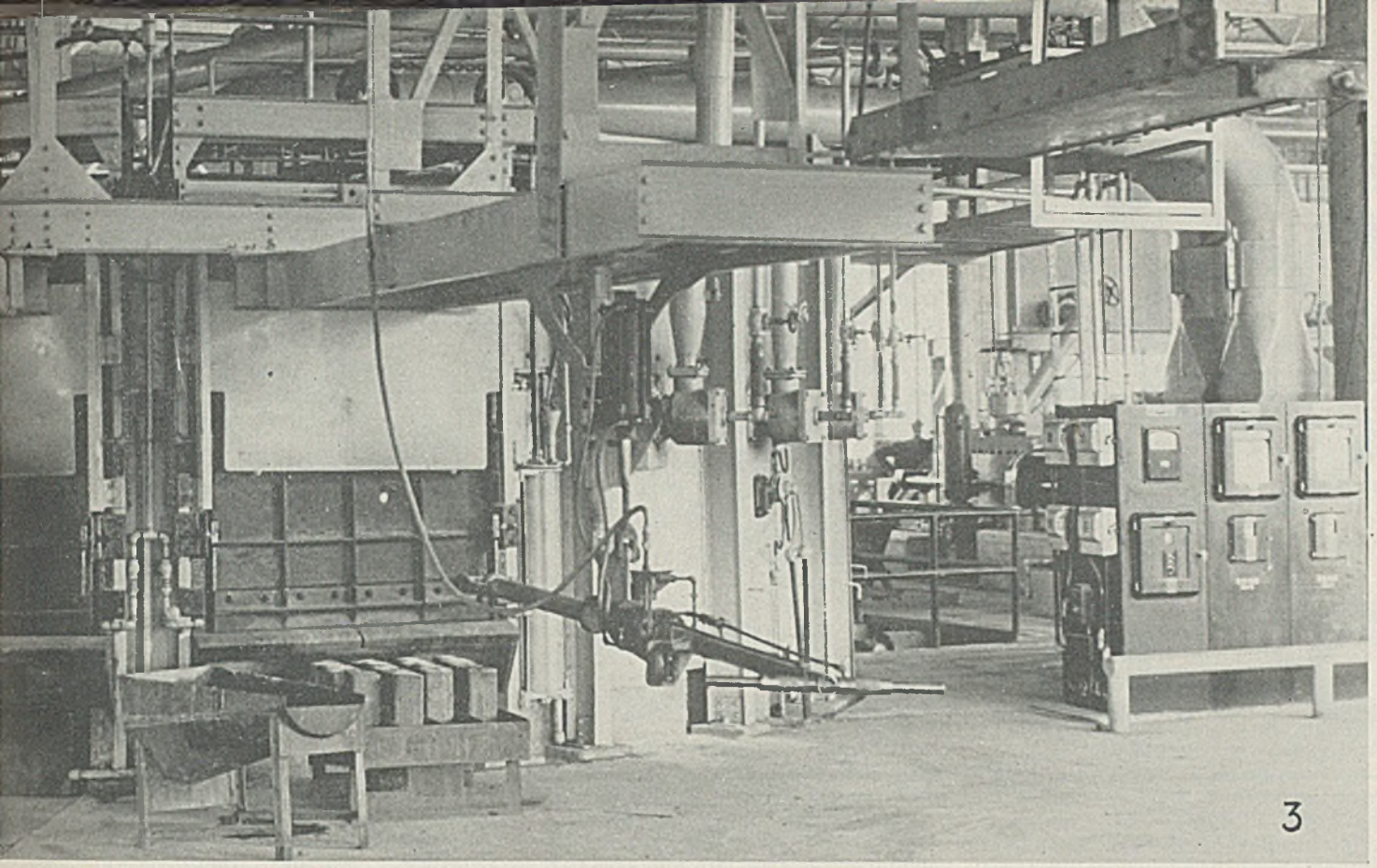


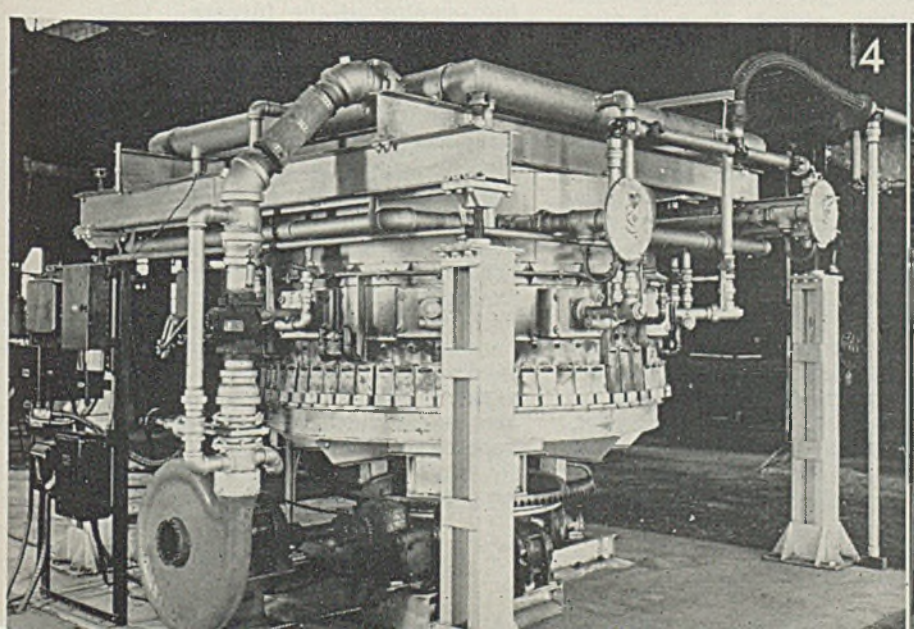
Fig. 3—General view of rotary-hearth furnace shown in Fig. 6. Note charging equipment with air lifts suspended in front of both the charging and discharging doors. Amsler-Morton Co. photo

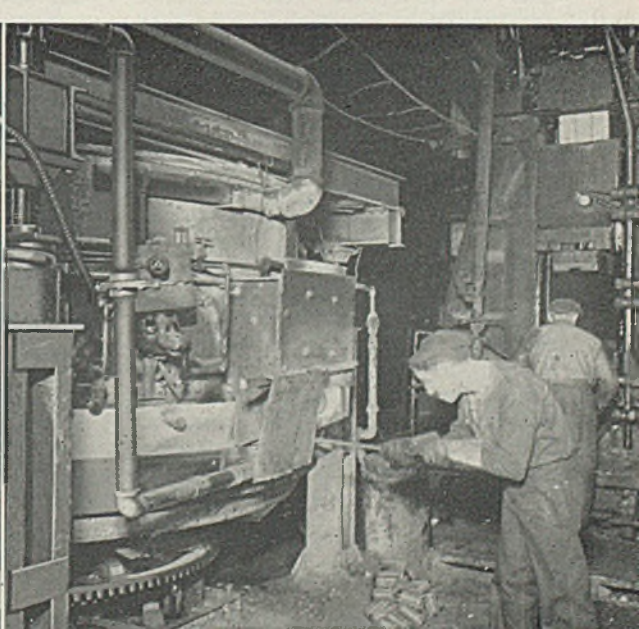
ditions; and making provision for movement of stock through the furnace. It becomes apparent that we are concerned not only with a problem in physical metallurgy but also in mechanical engineering.

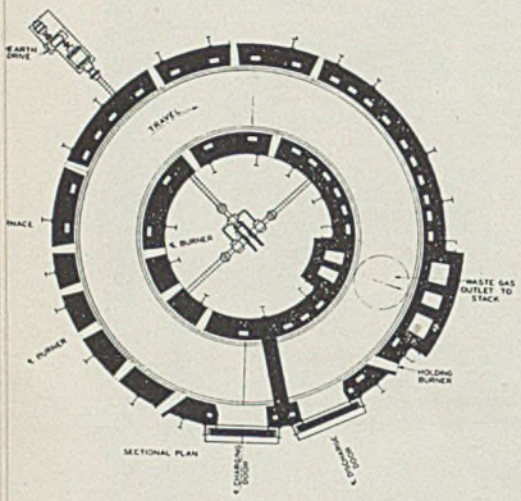
To present an orderly concept of the important field occupied by the industrial furnace and the forging furnace in particular, we might select any one of several modes of classification. For example, the basis might be functional—that is, according to the use to which the furnace is to be put; or again we might find it convenient to think of the product under treatment; or perhaps of the mechanical device used to transport the charge. These various groupings could be further qualified by reference to the nature of the fuel or other source of heat energy and by the manner in which that energy is conserved. Thus we have gas-fired forging furnaces, continuous-conveyor or rotating-hearth types, recuperative and regenerative furnaces, etc.; and among those using electric power, direct-resistance heaters, induction furnaces and furnaces employing resistors as heating elements.

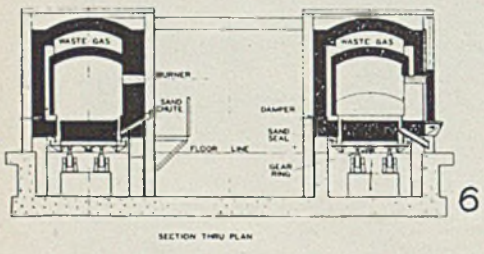
Among the more spectacular developments of recent times have been the substitution of the rotating hearth for the stationary hearth in the heating of shell billets; the use of the controlled atmosphere to avoid scaling; and the evolutionary progress of the electric furnace and induction heating. As a characteristic illustration of the first mentioned, Fig. 2 shows three of the nine rotary-hearth furnaces now in use for heating shell billets at the plant of the National Steel Car Co., Hamilton, Ont. The story of this installation goes back about four years, when it became necessary for the company to change to square billets from round billets which had been handled in a sloping hearth forge. The rotating hearth allows loading and unloading of billets at practically the same point. Also, it is possible to secure all the advantages of a conveyor furnace, in which every piece is heated in the same way, without the expense of alloy conveyor members and the like.

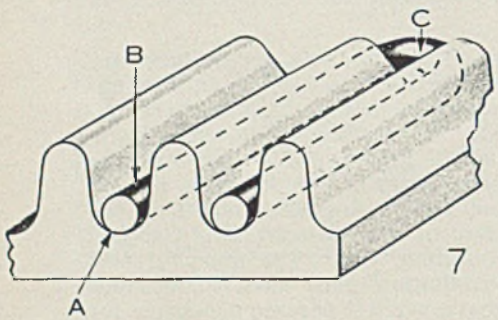
While the attainment of uniform-











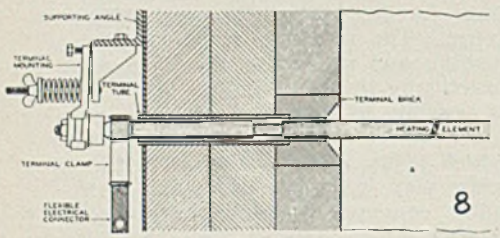


Fig. 6—Plan and section sketches of rotary-hearth furnace. Heat is applied near charging end to secure greater uniformity of temperature and to speed up heating. Amsler-Morton Co. photo

Fig. 7—Section showing how round rod of heating element fits into depressions in radiant plates which reflect heat out into furnace chamber. Figs. 7 and 9—Hevi Duty Electric Co. photos

Fig. 8—Sketch of cross section through furnace wall of electric furnace employing pin-type silicon-carbide heating element. Heating chamber is at right, heating element extending through opposite wall and held under compression by another terminal mounting like that shown at left here. Globar Division, Carborundum Co. photo

ity of temperature throughout the heated stock is not important in plate bending, bolt heading and the like, in the case of a shell billet it is of the utmost consequence for the success of the piercing operation depends upon it since small temperature differences may easily cause the punch to run off center to the hotter region. Thus, in order to obtain very close control of temperature and uniformity in the distribution of the heat, the tunnel-type or doughnut form was chosen in preference to the dome type of unit in which the center of the furnace is kept hot. Further, by partitioning the tunnel to the fullest extent, into four zones and placing separate controls in each, exposure of the steel to the maximum temperature required for the forging operation is avoided until the billet is hot.

Friction Drive Is Used

Instead of employing a large ring gear at the periphery of the furnace, as is frequently done, this particular design utilizes a friction drive in order that slippage may take place should the hearth jam and stall. An electric motor drives it through a Reeves Vari-Speed pulley and a Winfield-Smith speed reducer. The problem of sealing the hearth is solved by the use of a sand seal in preference to a water seal on account of the influence of water vapor on the character of the scale. Nickel-bearing cast iron is employed to prevent grain growth. Similar alloy members are also used to enclose the rotating hearth, a plan which successfully avoids uneven expansion and consequent trouble.

Another type of rotary hearth furnace for heating prior to the nosing operation is shown in Fig. 1. It is a gas-fired unit built by Surface Combustion Corp. Shell bodies are inserted nose-end-first in the large holes seen extending around the sides of the unit, just the nose or open end of the shell body being heated.

Fig. 4 shows a gas-fired rotary furnace equipped with automatic temperature controls for both forging and hardening. When it is used for heating billet ends, a water-cooled lintel effectively screens the cool portion of the bar, thus preventing slippage in the gripping dies of the upsetter. The hearth and driving arrangements of this furnace are mounted independently of the upper portion, which is stationary and rests on four vertical columns. On top of each of these columns is a jack screw for adjusting the slot opening from 5 inches down to the completely closed position. When this furnace is utilized for the complete heating of the part, the slot is covered by a series of flap doors as shown in Fig. 4.

Fig. 5 exhibits a rotary-hearth forging furnace for heating 1800 pounds of rounds and bars per hour to a maximum temperature of 2600 degrees Fahr. It is equipped with the new gas-oil burners developed by Surface Combustion Corp. One half of the burners are hand-controlled and operate on a rich mixture of oil and city gas. The rest of the burners use gas only and are automatically controlled. The absence of smoke in the neighborhood of the furnace apertures should be noted.

This new burner is designed to burn both gas and oil simultaneously and to obtain the advantages of each individually without some of the disadvantages attendant on the use of either alone. Oil, gas and air enter by way of the three connections at pressures of 1½ to 2 pounds, 20 pounds and 16 ounces respectively. The rapid combustion of the gas accelerates the gasification, cracking and combustion of the oil to the end that combustion of the fuel is fully completed within the furnace. This produces maximum flame radiation and heating rates within minimum furnace temperatures. Further, there is a notable absence of smoke and soot as well as a reduction of flame sting-out through the furnace openings.

These suggestions are intelligible enough if we consider that in the conventional type of oil-fired furnace, the oil must first be "atomized" then gasified and that thereafter it is cracked or chemically broken down with liberation of free carbon. The initial combustion of part of the oil vapor supplies the heat required for further gasification of the oil and for the breaking down of the oil already gasified. Since these reactions are endothermic, the full heat content of the oil is not immediately realized, but instead there is partial initial absorption with consequent reduction of flame temperature and rate of combustion. This in turn suppresses gasification and cracking of the oil vapor, extending the combustion period and resulting frequently in a very hot and smoky sting-out from the working opening of the furnace.

Burners Have Wide Range

Combination burners of this type are applicable to a wide range of sizes of slot forge furnaces and production requirements.

Figs. 6 and 3 show a large rotary-hearth furnace built by the Amsler-Morton Co., Pittsburgh. General arrangement of this furnace is revealed in diagrammatic form in Fig. 6. Fig. 3 shows its general outward appearance. This company also specializes in furnaces of the recuperative type—that is, units in which heat is extracted from the escaping gases and returned to the furnace by way of the air for combustion. As opposed to the regenerative type

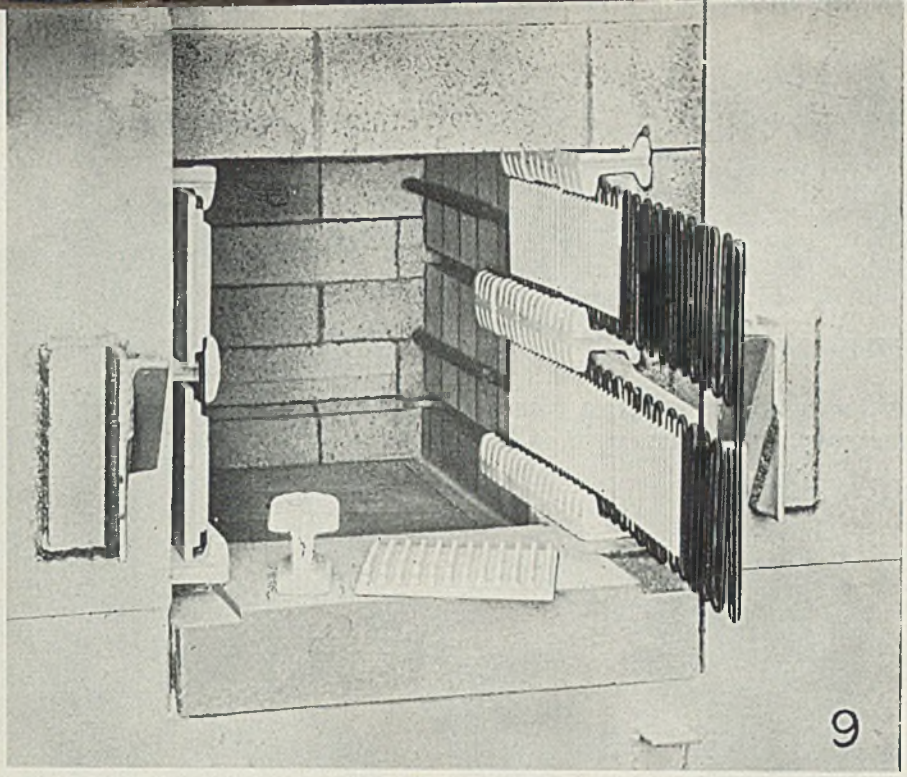


Fig. 9—Closeup of furnace chamber showing how electric resistor heating elements are mounted on furnace walls using radiant plates and fluted T-head supports

in which a mass of chequer-brick is first heated by the waste gas and thereafter parts with its heat to the incoming air (and sometimes the fuel gas also), recuperators maintain a continuous flow of hot flue gases which heat the cool entering air. Metal or refractory ducts keep the two streams apart, but allow heat to flow from the hotter stream to the colder.

Savings effected by this arrangement depend, of course, upon the temperature to which the incoming air or gas is raised. For instance, if the flue-gas temperature is 1600 degrees Fahr. and the combustion air is raised 200 degrees Fahr., we theoretically save about 4 per cent; with 400 degrees, 11 per cent; and so on up to a saving of 19 per cent when the combustion air is raised 800 degrees Fahr.

Turning now to the field of the furnaces using electric resistor heating elements, Fig. 7 exhibits the heating element in one well known design. The selection of a round rod results from a consideration of the maximum strength in various positions, and of the loss of weight from oxidation. The manner in which these heating elements are mounted in the furnace is well seen in Fig. 9, which exhibits one method of inserting the coils, the radiant plates and the fluted T-head supports into the furnace chamber.

This method of mounting confines the coils sufficiently and leaves them free to expand and contract with every variation in temperature. Heat from one strand cannot affect adjacent strands since the corrugated block tends to reflect it into the furnace after the fashion of the reflector of a lamp. Corrugating the insulating block increases its reflective capacity over that of a flat surface.

In earlier forms of this furnace, the radiant plates with their heating coils were held against the sides of the furnace by means of solid T-head supports; but in later designs the solid head gave way to the fluted head seen in the illustration, thus providing for greater heat release from the bends of the coils underneath the T-head supports.

With new heating elements of an alloy of iron, chromium and aluminum, furnaces of this type can now be operated at temperatures up to 2300 or 2400 degrees Fahr. While this alloy is resistant to oxidation at these temperatures, it tends to become somewhat plastic, characteristic of any metal at elevated temperatures. This involved a change in the design of the supporting refractory such that the weight of the radiant plates is carried by the T-supports instead of lying on the bends of the heating elements, which thus have complete freedom to expand and contract without any restraint whatsoever. Further, sufficient clearances are provided to permit the free expansion of the radiant plates and their T-supports and for the normal growth of the coils.

The entire assembly of return bend coil imbedded in its radiant plate and its T-supports is readily removed for replacement either as a result of deterioration or for the purpose of varying the amount of heat released, depending upon the class of work undertaken. Standard forms of radiant plates provide for coil pitches of 0.5 to 1.2-inch centers —radiant plates of the finer pitches being commonly used in comparatively small furnaces.

Another type of heating element for electric forging furnaces is recrystallized silicon carbide formed into rods known as Globar heating elements, a product of the Carborundum Co. Fig. 8 diagrams the arrangement of one type furnace arranged to use the pin-type Globar unit. Center section of these units is of high electrical resistance. Both ends are of low resistance so very little heat is developed in those portions of the element during operation.

Of each 5-inch end section, 3 inches is of the same diameter as the heating section, the other 2 inches being of a smaller diameter. Terminal rods extend in to contact the heating elements as shown. That portion of the terminal rods which extends outside the furnace is metallized to assure good electrical contact with the connector which is clamped around it. Spring mounts outside the furnace at each end maintain compression and good contact between heating elements and terminal rods. Note no artificial cooling is necessary, yet these units work efficiently in furnaces operating up to 2900 degrees Fahr.

A second type of Globar heating element has the low resistance ends of sufficient length to extend entirely through the furnace walls. The short lengths extending outside the furnace are metallized to assure good connection to the terminal clamps. This type needs no terminal mountings or accessories since the heating section and terminals form a continuous ceramic rod that is self-supporting, thus is easy to install and requires no maintenance.

The first type is made in effective heating lengths up to 60 inches, the second up to 46 inches—with maximum wattage ratings of some 18 and 28 kilowatts respectively.

Strange enough, the average furnace man in a forge shop is psychologically so affected by the noise and belching flames to which he is accustomed that his first contact with electrically powered furnaces which operate quietly without noise, smoke or gases are likely to create a situation like that which caused one operator to remark, when an electric unit was first put in, that now they would be ready to go if they had some aluminum or brass to forge—but steel? The amusing part of this incident is that although this furnace was only rated to heat 150 pounds of steel per hour to a temperature of 2250 degrees Fahr., it was crowded until it handled an output of 400 pounds per hour.

Electric forge furnaces built by C. I. Hayes and fitted with Globar heating units described above are widely used. A protective atmosphere may be employed to prevent scaling.

WHAT CAN I DO

To Speed War Production??

To the many people earnestly asking this question today, a man in the midst of war production problems presents a message that has much in it for all of us

By FREDERICK B. HEITKAMP
Vice President
American Type Founders Inc.
Elizabeth, N. J.

Frederick B. Heitkamp

THE REPEATED story of "too little, too late" along with report after report of serious military losses is causing many a plant manager, foreman and worker to ask himself this question: "What can I do to speed war production?"

First, if not already in war production, plant management can seek out a prime or subcontract, for which there are many opportunities due to the enormous needs of our armed forces. Your local Field Contract Office of the War Production Board (see list, Section II, p. 26, STEEL, April 20, 1942) can put you in touch with subcontracting opportunities.

The experience of American Typefounders Inc. in getting war work is typical of what can be done. First we went to—and I mean sought out—the Army and Navy Placement Bureau agencies where contracts are being let. We had to sell ourselves and our services, for war work is given only to those who can satisfy the procurement agencies of their ability to handle it. After obtaining the first few contracts, the efficiency with which they were handled made it easier for our company to obtain succeeding orders. In fact, with the reputation obtained in the initial effort, orders sought us out. Through the Office of Production Management's coming to us and asking us to get facilities to manufacture certain products for prime contractors, we became a subcontractor and in turn sublet our facilities.

The secret of success in war production work hinges largely on management. Top executives in our organization were given definite responsibilities in the various plants. New men were hired to supplement them in their capacities. Men were brought in from the normal sales department in the field from all over the United States and were given jobs they could handle in the new program. Some of these men were engineers and some were not.

From the service department in the field, skilled men were brought in and put to work on assembly lines and in the shop of our war plant.

Take my own case: As vice president and sales manager of our company, with the normal product gone and nothing to sell, yet having had 15 years in the machine tool industry, it was logical that I should take over the management of one of the plants. At the present time I am operating an assembly plant, the parts for which are supplied by more than 43 subcontractors located at different points all the way from the Atlantic coast as far west as Iowa.

Second, if you are already in war production, subcontract some of your work to increase your capacity and your ability to handle more difficult war work. This means locating adequate sources of manufacture. This in turn is a selection process in which you choose the manufacturers who appear best able to handle your work. Even when you have selected from the many who may want to do the job those few who are in a position best to do it, it is still necessary for you to help them in their production, for you may even have to supply machine tools, gages, jigs and fixtures, as well as production engineering help and supervision.

Experience of American Typefounders Inc. in subcontracting is that in many plants of subcontractors it is necessary to place a resident production engineer to expedite production, to help break production bottlenecks and to supervise inspection. Thus he in general represents the prime contractor as a resident manager or managerial assistant. It is his responsibility to see that all parts come out of that subcontractor's plant, pass proper

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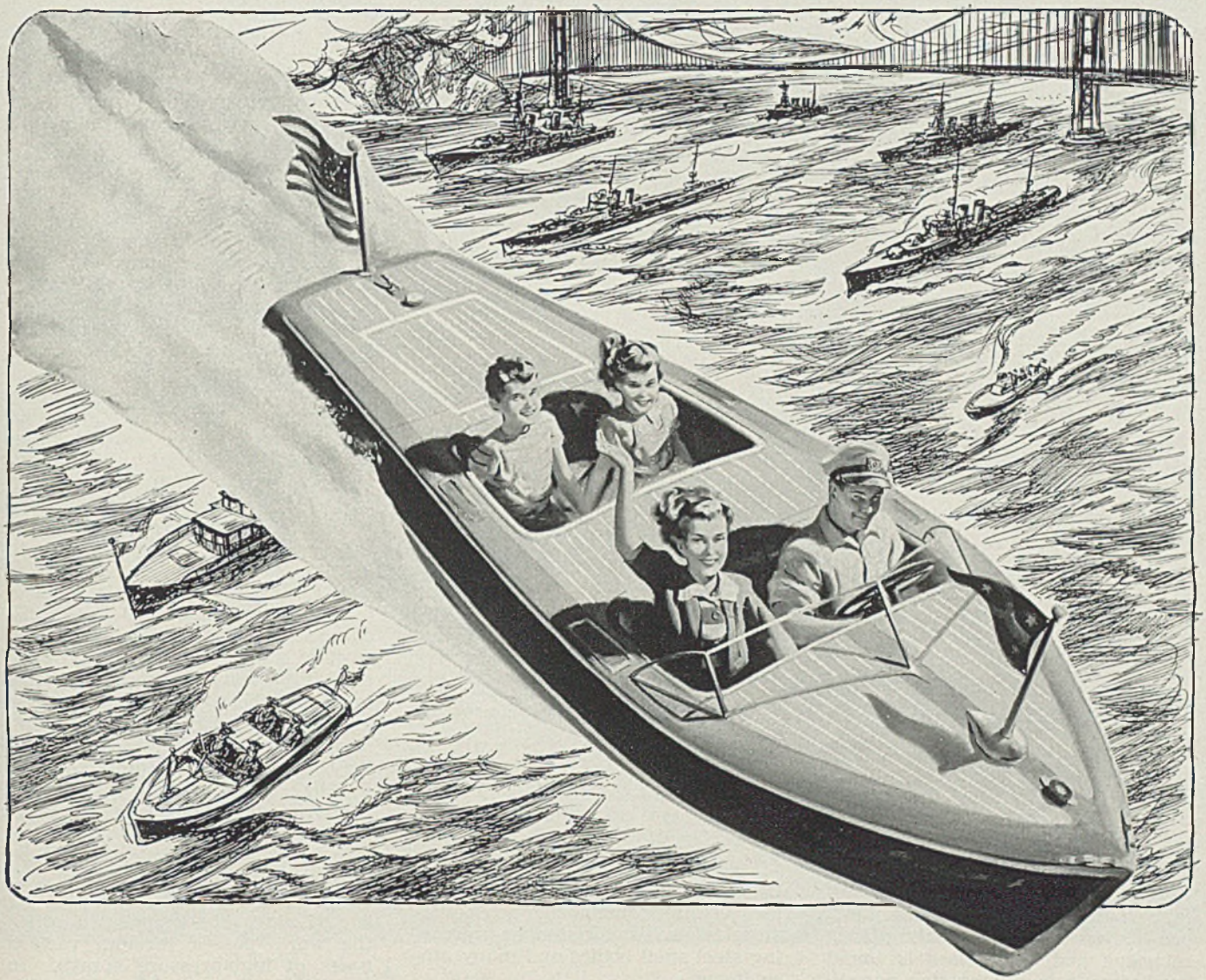
From a talk given at the Machine Tool Electrification Forum held at the Westinghouse Electric & Mfg. Co. plant, East Pittsburgh, Pa., April 7, 1942.



Jim Eaton's speedboat is out hunting Japs . . .

She was a sleek mahogany runabout when she stole Jim Eaton's heart at the last motor boat show. But since then she has put on weight and been painted battleship gray. She is in the Navy now, patrolling a stretch of bay along the Pacific coast—part of an enormous fleet of patrol and picket boats, mine yawls and mosquito boats to which our builders of pleasure craft have turned their world-famous genius and facilities.

American builders of power boats know the meaning and methods of mass production. When they changed from yachts and runabouts to war craft the result was, not a trickle, but a swelling stream of boats for the Army, Navy and Marines.

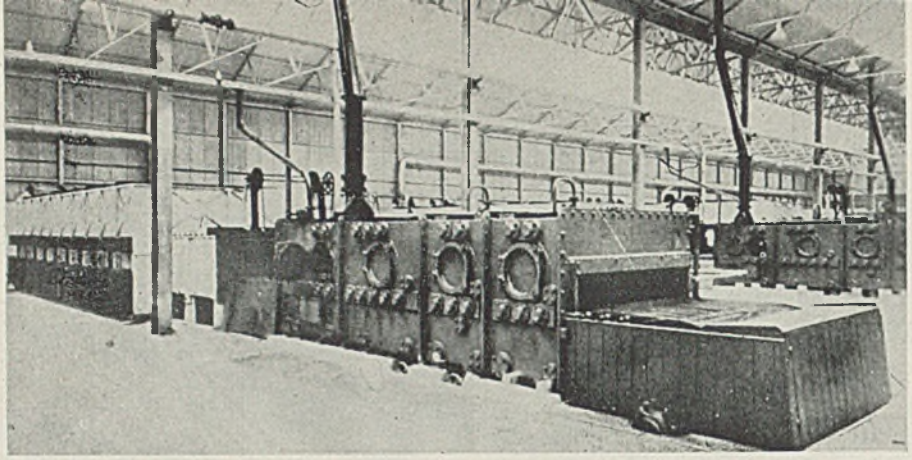
When problems arose they were chiefly in adapting production methods to the new designs and special alloys required by war. In cooperation with Revere Technical Advisory staff, many famous boat builders made the change-over as smoothly as they would in producing a new model. For in addition to sound copper alloys, Revere supplies this service to help make manufacturing operations easier and quicker.

Every ounce of copper our country can produce goes directly into vital war materials. Fortunately, Revere is equipped with new plants, improved machines, advanced processes which add enormously to the nation's capacity to produce fine copper alloys. Not only are these plants working to the limit of their resources, but more facilities are steadily being added to bring the day of *victory* still nearer.

The Revere Technical Advisory Service functions in (1) developing new and better Revere materials to meet active or anticipated demands; (2) supplying specific and detailed knowledge of the properties of engineering and construction materials; (3) continuously observing developments of science and engineering for their utilization in producing methods and equipment; (4) helping industrial executives make use of data thus developed. This service is available to you, free.

REVERE COPPER AND BRASS INCORPORATED

EXECUTIVE OFFICES: 230 PARK AVENUE, NEW YORK



High-pressure spray, continuous conveyor type, automatic pickling, washing and drying equipment attached to discharge end of a gas-heated muffle furnace used to anneal deep-drawn brass cups for cartridge and shell cases

Heat-Treating Costs Cut by

AUTOMATIC SPRAY PICKLING

. . . combined annealing equipment to produce a single high-production line that heat treats, pickles, washes and dries the work in one continuous operation. Offers important means for reducing amount of handling involved in these operations

WHAT APPEARS to be an important change in equipment and methods for annealing and pickling brass cartridge and shell cases is found in automatic equipment for annealing and pickling operations. This equipment was originally developed by Curren Bros. Ltd., Cardiff, Wales, who have built and installed virtually all of the shell and cartridge case processing equipment in England as well as several plants in Canada and two plants in the New England area.

Hanson-Van Winkle-Munning Co., Matawan, N. J., sole sales representatives in the United States for this equipment, points out that while these installations are for annealing and pickling brass shell, such equipment is also well suited to processing steel shell bodies and many other items.

The outstanding feature of this equipment is the use of high-pressure sprays or jets through which the pickling solution is impinged against the work as it passes through the equipment. Belt or roller conveyors are utilized to carry the work through the pickling and cleaning chambers. The equipment can be set up to operate automatically to give the work a predetermined cycle of pickling and cleaning treatments.

Also, it is possible that automatic pickling of this kind may reduce the necessity for expensive controlled-atmosphere annealing furnaces because a plain muffle furnace is cheaper to install and therefore within the reach of users having a limited output. At the same time it works satisfactorily in conjunction with the spray pickling equipment. It is entirely possible that many pickling and cleaning tanks will be replaced by the spray-chamber type of equipment. Which of the two methods should be used is usually determined by the shape, size and quantity of the articles to be treated.

A typical installation includes a pickling chamber placed at the discharge end of a gas-heated muffle furnace so cold-worked articles such as deep drawn brass cups can be loaded on the conveying mechanism at the mouth of the furnace and need not be touched by hand until they emerge at the other end of the line, having undergone meanwhile a complete cycle of annealing, pickling, washing and drying treatments.

Spray pickling chambers of this kind are lined with rubber. A number of zones are supplied in which the work passes through various types of high-pressure sprays. In the usual setup, the first chamber contains high-pressure acid sprays, which are directed against the work from all angles to assure complete coverage of all its surfaces. Sprays also can be designed to travel into interiors to clean thoroughly inside surfaces as well.

In the second chamber, sprays of hot water thoroughly wash the work and warm it at the same time so that it dries quickly.

It is common practice to use hot sulphuric acid for pickling both brass shell cases and steel shell bodies. Recommendations include a strength of about 2½ per cent and a temperature of about 140 degrees Fahr. The acid is heated by steam coils made of acid-resisting alloy in the main acid reservoir, which need only a fraction of the amount of

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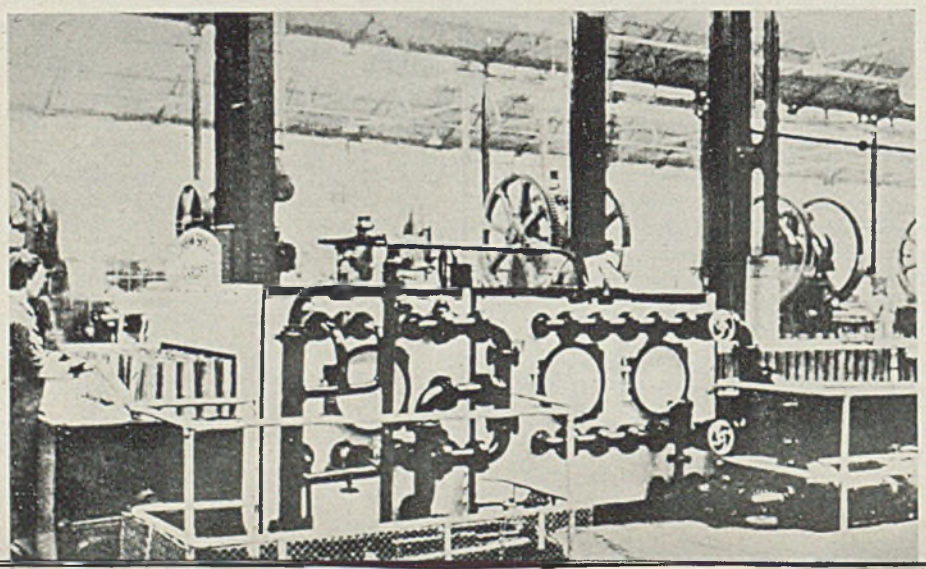
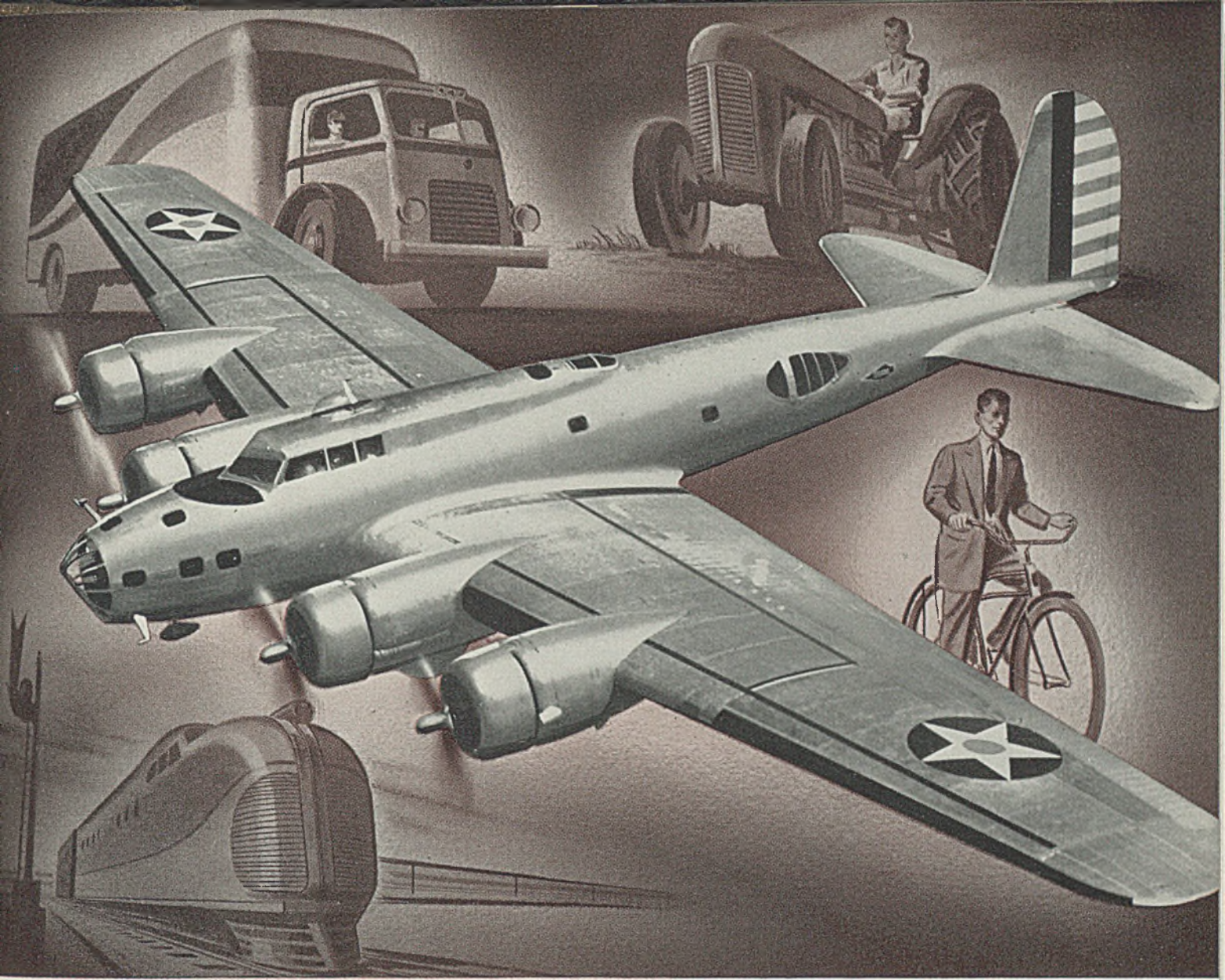


Woman operator unloading brass shell cases which have just passed through a line of automatic annealing, pickling, washing and drying equipment in an English munitions factory. The setup is also employed for treating steel shell bodies and other parts



America's largest wire maker

is on the job where it counts

IT'S no military secret. The nation is well aware of the fact that, among the enormous tonnages of steel now enlisted for war purposes, wire and wire products are high on the list. And rightly so. For they are indispensable in the vital task of equipping our fighting forces. That is why the ever-increasing withdrawal of wire from civilian use has been patriotically accepted by industry and the public alike.

For more than 100 years, we have been learning how to make wire and wire products better and better. But we have never let ourselves be satisfied. Our scientists and research men are still striving for constant improvements—not only for today's needs, but for the years to come.

With wire products so indispensable—with so many of the things we take for granted dependent upon wire in its various forms—isn't it important to make sure that the steel wire you use is the most reliable you can buy?

And isn't it reasonable to assume that the *safest* source of wire supply is the company that has the world's largest facilities for steel wire making, and has been at it for more than a hundred years?

★ ★ ★ ★ ★ ★ ★ ★ ★

American industry is accepting the fact that war needs have first call on all production. We are confident that our customers appreciate and understand the sacrifices that must be made during these times. In this all-out effort, our energies and resources are dedicated to the common task that lies before all of us.

So far as possible, we will endeavor to serve industry's needs, but—this above all—we must not forget that our very freedom is in danger. With courage and determination, let us all concentrate on its defense—so that we may march, hand in hand, to a victorious peace.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

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

Cold Finished Steel Bars · Cold Rolled Strip Steel · Stainless Steel
Manufacturers' Wires · Spring Wire · Welding Wire · Wire Springs

Wire maker to the nation . . . today and tomorrow

UNITED STATES STEEL

Campaign Ups Production

(*Continued from Page 37*)

12:30 p.m., 3:30 to 3:50 p.m., 4 to 4:20 p.m. and 5 to 5:20 p.m. Transcriptions are to be heard by the night shifts at certain set intervals,

Various requests have come in to RCA from companies throughout the United States and Canada for permission to adopt its "Beat the Promise" program, in its entirety or in part. Special posters, particularly the "Don't Be a Bottleneck" and the "Ideas Will Help" posters, have been in heavy demand. The company has gladly complied with all these requests. The company has purposely refrained from copyrighting any part of it. In furnishing posters, cut-outs, stickers, buttons and so forth, it does so at cost with all charges for art work and other initial expense marked off.

One company employing no more than 600 men recently adopted the whole program, beginning with the initial "teaser" campaign.

No phase of the entire program has attracted more attention than the company's suggestion plan, which has been developed to a high degree over the course of years. Last year when there was the special 3-month drive in the fall, not only were suggestions at the company's five plants especially numerous, but acceptances reached the rather astonishing total of 18 per cent of all suggestions submitted.

Monetary awards for accepted suggestions are paid to all employes except those who are employed for the express purpose of developing new methods, ideas, processes and the like or those whose suggestions or ideas arise from or have a direct bearing on the work they are specifically employed to do. This latter, however, does not apply to hourly wage employes or salaried employes not classified as supervisors, all of whom are eligible to receive monetary awards for any accepted suggestion or idea.

All salaried supervisory employes, except company officials, superintendents or heads of major departments, are eligible to receive monetary awards for accepted suggestions not specifically connected with their fields of activity. Officials of the company, superintendents or heads of major departments receive acknowledgment and commendation for accepted suggestions in fields other than their own.

Cash awards range from a minimum of $2 to a maximum of $100. Except when suggestions relate to intangible matters, awards are based usually on 5 per cent of the estimated net savings or profits for the first year. Such estimates not infrequently have to be revised upward during the course of the period because a greater volume of work

Fig. 9—Colorful action posters bring home to the workers the significance of their production efforts in winning the war. Constant reminders of the importance of production helps keep everyone on their toes

than anticipated may enhance the value of a given suggestion or because of some other reason. Obviously it is impossible in many cases to appraise definitely the full value of an idea at the time recognition is first given. Usually the suggestors themselves are very alert to new developments which might enhance the value of their ideas, and often they check with the suggestion supervisor just to make sure no bets are being overlooked. All this, of course, is as it should be and naturally is encouraged.

Inter-departmental campaigns are conducted throughout the year with special prizes offered. At the end of each year still other special awards are made not exceeding $250 each for the four outstanding suggestions adopted during that period. All items (the intangibles) which cannot be measured in dollars are evaluated by the suggestion supervisor or the foreman involved, with the awards ranging from $2 to $10. Awards for accepted suggestions are paid as promptly as possible or at intervals of not less than one month.

Tangible suggestions generally relate to production costs, material conservation, time saving, or waste elimination. The intangibles quite often bear on safety, plant protection, increased quality (although this may or may not fall in this group), or improved working conditions, such as better lighting or better ventilation.

If by some chance some idea does not appear to have merit at the time it is made but finds application through some subsequent development, the suggestor of the idea gets credit.

Originally a central or major suggestion committee was set up at each plant. It was composed of one representative from each of the major departments appointed by an officer or a leading executive of the company. This did not work out too satisfactorily in actual practice because of the difficulty in getting all members regularly assembled and the length of time required for going over a long list of suggestions.

Consequently decisions now are usually made in each case by the suggestion plan supervisor and whoever may be identified with the investigation and general appraisal of the suggestions; in other words, by the suggestion supervisor, the foreman or sub-foreman of the department to which the suggestion might apply and some member of the cost control department, who invariably is called in when the suggestion falls in the tangible category.

Suggestions are collected from the various suggestion boxes at least twice a week and are delivered by a special collector to the suggestion supervisor, who reads them over and passes them out for investigation. The suggestion forms are in three sections. One part is the suggestor's identification stub and the record of his or her suggestion. Part two contains space for the suggestor's name, number, location and date. This stub is removed and filed under lock and key by the suggestion supervisor until final decision has been made on the suggestion, thus keeping the suggestor's identification confidential. Part three is used for the submission of the idea.

Upon completing the study, the investigator makes out a statement, which is attached to the suggestion and returned to the supervisor. He also fills in certain items on a form which contains space for comments on feasibility, practicability, value, savings and so forth and also space for the final decision. This is returned to the supervisor at the same time as the suggestion.

If the idea appears good, (depending upon the type, of course) it is then generally forwarded to the cost control department for an estimate of savings. All suggestions with patent possibilities are referred to the patent department. Then with all comments attached the suggestion is again returned to the plan supervisor, who makes the final decision, based on the comments.

Full data then is delivered to someone in position over the suggestor, who presents the award. If the idea is rejected, explanation is made in detail why the idea cannot be used.

If the suggestor is not satisfied, he has the right to appeal. The company emphasizes that this is of the greatest importance. The mat-

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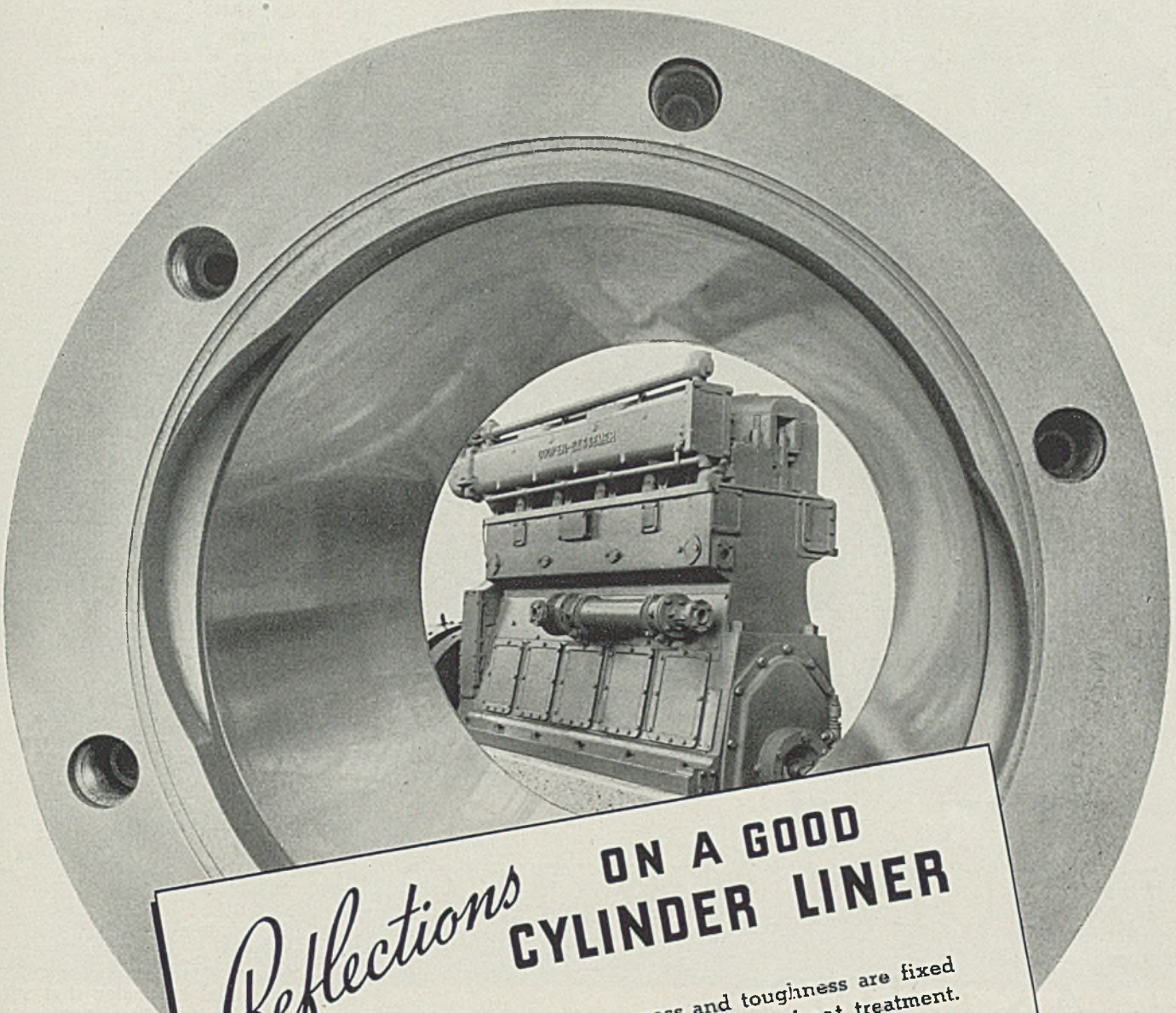
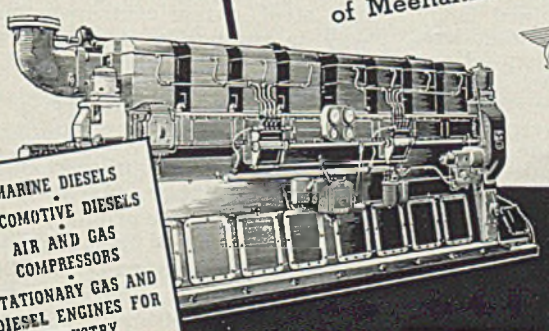


Reflections ON A GOOD CYLINDER LINER

Precision honed to a scientifically-correct mat finish and absolutely uniform throughout its entire length, this cylinder liner typifies Cooper-Bessemer workmanship . . . means maximum, efficient power throughout the engine's long life.

These cylinder liners are made of Meehanite Metal . . . hardness and toughness are fixed by scientific heat treatment. Example: After 5800 hours of tough service, liners from a pair of C-B Diesels showed less than a thousandth of an inch wear for each thousand hours of work.

Features like these have built a Cooper-Bessemer reputation for reliability, economy, and outstanding performance . . . are keeping thousands of these engines continuously on the job, in ships and shops and power plants, working night and day for American victory!



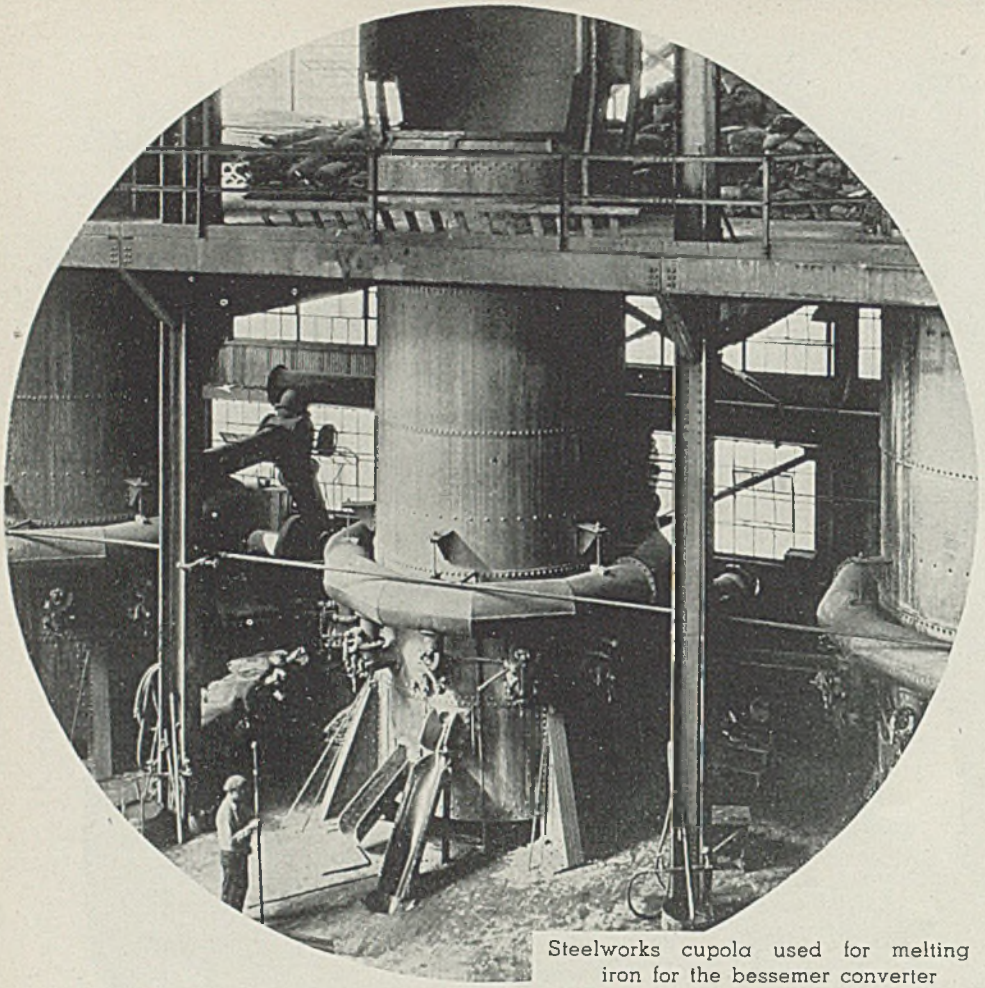
MARINE DIESELS
LOCOMOTIVE DIESELS
AIR AND GAS COMPRESSORS
STATIONARY GAS AND DIESEL ENGINES FOR INDUSTRY

Cooper-Bessemer

MOUNT VERNON, OHIO

PLANTS: MOUNT VERNON, OHIO AND GROVE CITY, PA.

NEW YORK CITY · WASHINGTON, D. C. · ST. LOUIS, MO. · TULSA · HOUSTON · DALLAS · SHREVEPORT · SEATTLE



Steelworks cupola used for melting iron for the bessemer converter

Recent Developments in

DESULPHURIZING CAST IRON

Rapid metallurgy makes use of the cupola, bessemer converter and electric furnace. Metal is desulphurized between cupola and converter and blown metal dephosphorized between converter and electric furnace. About 70 per cent of these elements are removed by ladle treatment

G. S. EVANS
Metallurgist
Mathieson Alkali Works Inc.
New York

THE USE of alkalies for desulphurizing and refining molten cast iron in the ladle and the effect of the treatment upon the properties of gray iron castings was first mentioned in literature during the 1905's. British patent No. 2282, dated 1867, on "Improvements in Treating Cast Iron" was issued to Thomas Horsley and described the treatment of cast iron in the ladle with alkalies. Claims made for the advantage of the process at that time anticipated in substance about all that since has been published on the subject. This patent specification states:

"The object to be attained is by fluxing and purifying the cast iron whilst in a state of fusion—either as it runs from the blast furnace or from other remelting furnaces to convert it into a 'clean' and 'dense' substance for the casting of steam and other cylinders, bearings . . . retorts and other articles, and to produce iron ore convertible into steel . . . I attain these ends by the use of . . . fixed alkalies or alkaline earths or mixtures of the same . . . The 'reagent' is by preference thrown into the ladle or into the iron whilst running."

In the years immediately following, others described desulphurizing with sodium carbonate (soda ash), reporting on the per cent sulphur reduction by the treatment and its effect on the structure, soundness and machinability of gray iron castings.

It would seem that anything offering such promises in the industry would have been adopted right off. However, nothing of import was done in the way of commercial applications of desulphurizing until after World War No. 1, when the process was taken up as a means of using the vast accumulation of iron and steel scrap dumped on the market both here and abroad—and for coping with the generally inferior quality foundry coke supplied to foundries during the period of industrial activity following the war.

Modern Developments

Since the early '20s, there has been a gradual increase in the use of the alkalies in the foundry industry. Although first adopted as a means of using percentages of scrap in cupola mixtures, this advantage in many instances is now considered of secondary importance when compared to improvements in the castability of the metal, soundness, strength and machinability of the finished castings coming with the refining.

Now the whole world is at death's grip again, and we are in the midst of an industrial expansion that surpases all imagination. Again we look for new ways of meeting an emergency, and new attention is attracted to this old process.

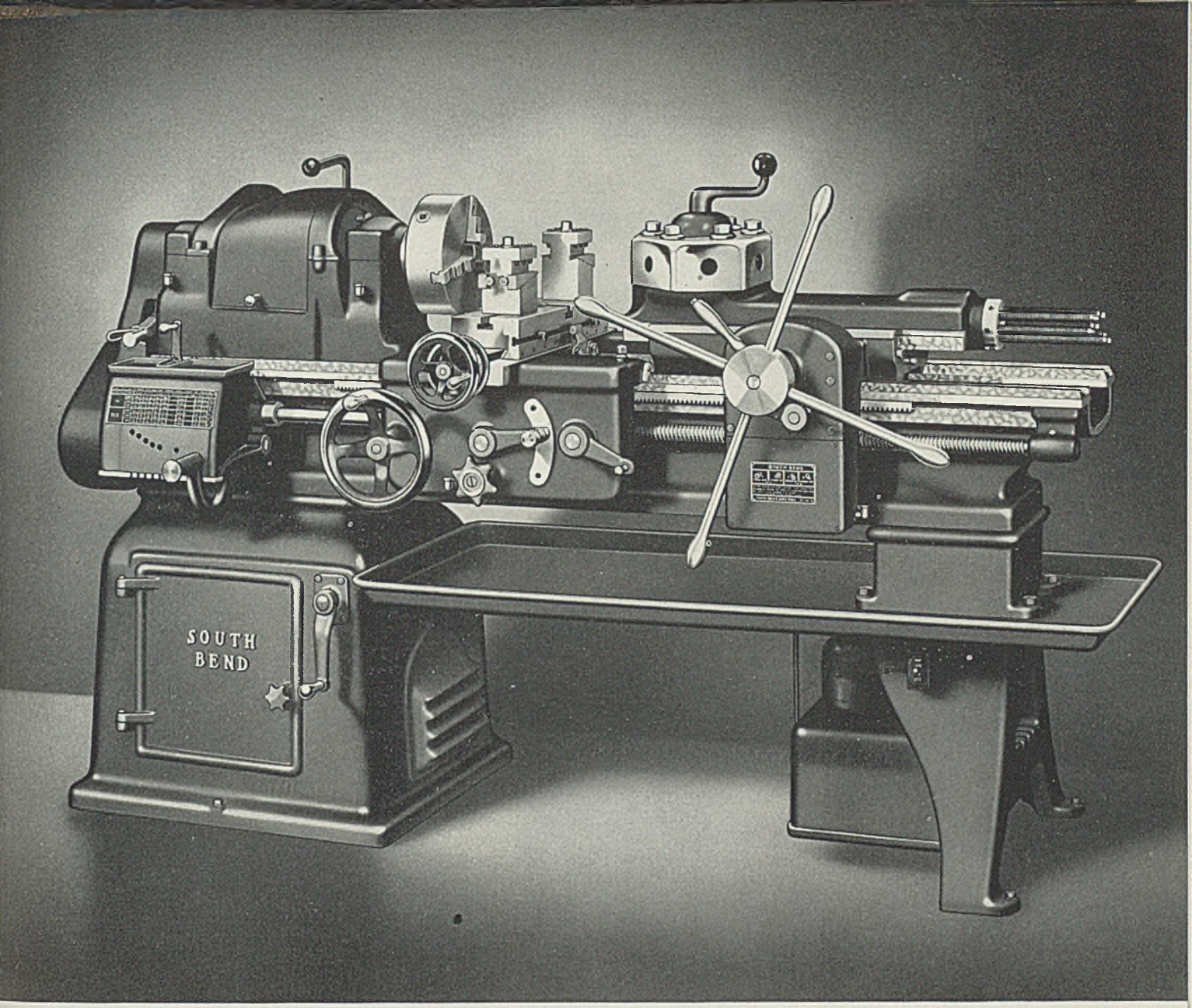
Today desulphurizing is extended to the iron and steel industry, where it offers the means of making more and better pig iron and steel with our present plant equipment. Available information discloses that desulphurizing offers a means of reducing costs at many locations, as well as effecting some increase in production.

Considering the present need for greater tonnages of both pig iron and steel, a few cents per ton one way or another is of secondary importance at this time.

Rapid Metallurgy

In a 40-ton electric furnace it takes about one hour to remove 10 points of sulphur (0.035 to 0.025 per cent) with an ordinary carbide slag. Yet, a heat finishing at 0.025 per cent sulphur will usually tap out at 0.018 per cent, a drop of 7 points in a matter of a few minutes—quick metallurgy, due in part to the pronounced increase in slag-

From a paper presented at the tenth annual Foundry Practice conference, Birmingham, Ala., Feb. 19-21.



SOUTH BEND TURRET LATHES

For Efficient Production of Duplicate Parts

THE No. 2H South Bend Turret Lathe is a dependable tool for the efficient production of duplicate parts. It has the precision for exacting, close-tolerance operations, ample power, and the rigidity required for producing a fine finish.

Twelve spindle speeds, ranging from 16 to 880 R.P.M. are available. A two-speed motor with convenient lever control permits quick change from high to low speed for reaming and tapping operations. Smooth operation for precision turning and boring operations at high speed is achieved by direct belt drive to the spindle. Slow speeds for heavy cuts on large diameters are driven through back gears.

Bar work up to 1″ round may be passed through the collet. The spindle hole has a capacity for stock up to 1⅜″ in diameter when a universal chuck is used. Maximum capacity for chucking operations is 6⅞″ swing over the universal saddle cross slide and 16¼″ swing over the bed ways.

The ram-type turret has power feed and hand feed, with individual adjustable feed trip and stop for each of the six turret faces. The turret head indexes automatically on the return stroke of the turret slide.

The universal carriage has power cross feeds and power longitudinal feeds, also lead screw and splitnut feeds for cutting accurate screw threads. Plain cross slide fitted with front and back tool blocks is standard equipment. A 4-way turret tool block can be supplied to order. Write for a catalog and the name of our dealer located nearest you.

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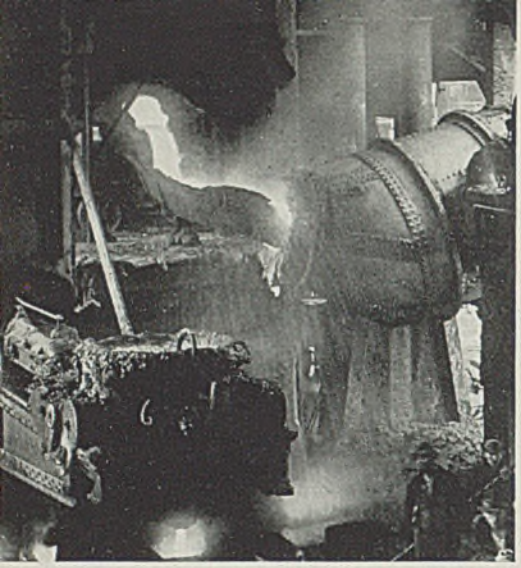


Cupola metal being poured from transfer ladle into a bessemer converter

metal surface contact resulting during the pour. What if this reaction can be accelerated or extended to remove an additional 5 points of sulphur? The answer is on the way.

Speaking of rapid metallurgy, plans are now under way at one plant to build up a large electric furnace charge with small additions of desulphurized and dephosphorized converter steel. The purpose of the small additions is to provide more frequent agitation of the bath as a means of accelerating the refining reactions.

If it is aslo found that a carbide slag can be maintained on the bath, this will reduce furnace time required for final desulphurizing and refining to a minimum—the epitome or parid metallurgy in steelmaking.

If all blast furnaces would leave off the amount of limestone required for reducing sulphur in the furnace from, say, an average of 0.07 to 0.035 per cent, or from 0.06 to 0.025 per cent, and desulphurize the iron from the furnace with alkalies to an equivalent extent, there would be from 7 to 10 per cent more and better iron and steel, and more coke for cupolas.

Low Silicon—Low Sulphur Iron

Each pound of silicon added to the open hearth in the pig iron requires in the neighborhood of 10 pounds of limestone and the formation of an even larger volume of slag in its removal—all of which takes that much more furnace time and fuel.

It has been demonstrated that physically hot iron averaging 0.70 per cent silicon can be produced regularly in the blast furnace, though at a sacrifice of 8 to 10 points in sulphur as compared to operating the furnace to produce 1.05 per cent silicon iron within the range of 0.025 to 0.035 per cent sulphur. With the proper equipment and a little added effort on the part of furnacemen, such iron can be reduced from 0.045 or 0.035 to 0.022 per cent sulphur for about 30 cents per ton of pig iron. It is true there is some loss in temperature with desulphurizing; however, it has been proven that this is more than offset by the advantages of lower silicon and by cleaner metal coming with desulphurizing, the advantages of which have not yet been appreciated.

Difference in cost of the ingot has not been determined but if all open-hearth superintendents charged hot fluid iron averaging 0.60 to 0.75 per cent silicon with under 0.025 per cent sulphur, instead of the usual 0.90 to 1.05 per cent silicon iron of the same sulphur content, more and better steel would be produced.

Furthermore, from information now available, it would seem that without any changes in blast furnace practice, other than desulphurizing the iron as it now comes from the furnace to the extent of 10 or 15 points, that the saving in open-hearth time, and improvements in the quality of the finished products coming with the use of such lower sulphur, would fully justify the cost of desulphurizing—certainly as applied to quality steels.

A prominent steelmaker has this to say: "As regards the effect of sulphur on the rolling qualities of electric alloy steels, a 10-point reduction (from 0.025 to 0.015 per cent) saves an hour's chipping time per ton on the average. One hour's chipping time with us means $1.95 per ton on the finished product."

In view of the great need for more and better pig iron and steel at this time and in view of the possibilities offered by desulphurizing, as explained, it would seem that this should now be given a thorough trial by the industry.

Why the Delay in Desulphurizing?

In the setup of most of our larger steel organizations the operating management is first of all interested in production and bonuses; the blast furnace superintendent's first thought is maximum tonnage of pig iron at low cost in the ladle; the open-hearth department likewise is interested first of all in ingot tonnage at low cost; and the rolling mill is also looking for more tonnage.

This system started by Andrew Carnegie and perfected by Charles Schwab has helped to make our large steel industry, but it has hampered new developments and refinements in pig iron and steelmaking processes.

Practices enumerated certainly promise an increase in the output of pig iron and steel, and at a saving in cost. They can be put into use now with a little added effort, when extra tonnage is in urgent demand.

To provide the tonnage of soda ash that would be required by our blast furnaces in such event might necessitate curtailing the production of soap or stop the use of alkalies for removing the odor from gasoline. But it would be better to be less clean than to be dominated by Japs and Germans.

Desulphurizing Cleans Iron

The value of desulphurizing can be appreciated when considering that with the proper adjustment of silicon and manganese by alloy additions and in some cases graphitizing, both stove-plate and high-test iron castings are being made regularly with refined cupola iron from mixtures made of the lowest grades of cast-iron scrap, including some burned grate bars. Also similarly desulphurized and refined cupola iron is being used as hot metal charges in open-hearth practice in the production of high-quality alloy steels, where before it was the custom to use only selected grades or pig iron in making these same steels.

It is difficult to make a sound, strong casting from blast furnace iron or from 100 per cent pig iron mixtures remelted in the cupola. On direct metal the effect of the refining action of soda ash in improving castability is pronounced and this practice now is followed at most blast furnaces using direct metal for making castings.

This improvement, it is believed, results from the action of soda slags in washing out entrained silicates, unreduced oxides, and/or kish—if so, this and the removal of only limited quantities of sulphur would help in the open hearth.

It will be understood that the use of such low-grade mixtures by foundries is not recommended and the practice is mentioned merely to illustrate what can be accomplished with good cupola melting practice and when molten cast iron is properly desulphurized or refined with alkalies.

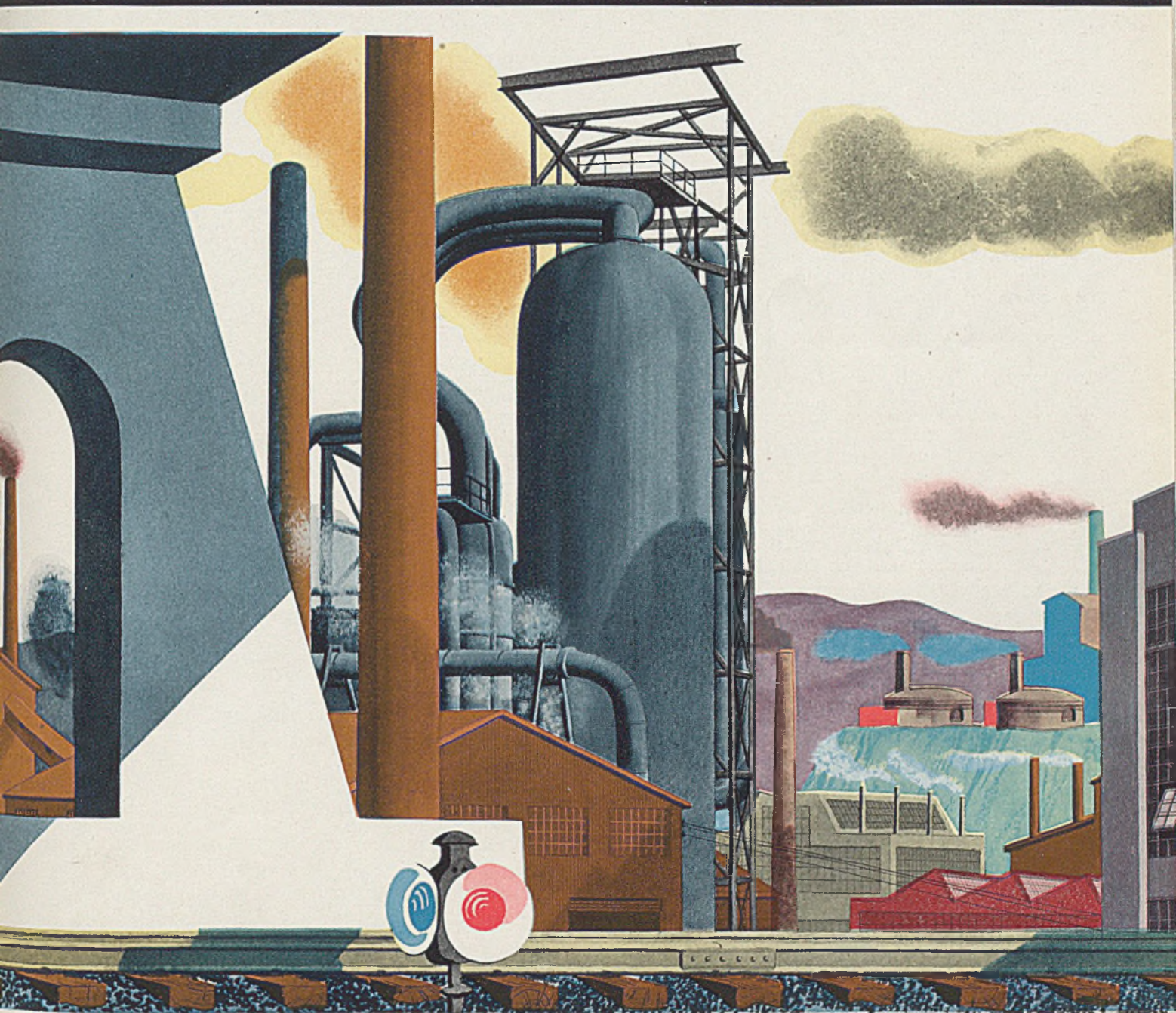
Again it would seem to illustrate

Per Cent Sulphur Reduction With Fused Soda Ash

Sulphur in Iron Original		Purite Per Ton, Pounds 2	5	10	20	30	40	Maximum reductions, Per Cent
0.15%	Final	0.13%	0.11%	0.07%	0.055%	0.045%	0.040%	73
0.12	Final	0.11	0.09	0.06	0.048	0.042	0.036	70
0.09	Final	0.085	0.075	0.055	0.045	0.037	0.032	65
0.07	Final	0.07	0.06	0.05	0.04	0.032	0.028	60

HARBISON-WALKER

REFRACTORIES



HARBISON-WALKER REFRACTORIES COMPANY

HARBISON-WALKER

FIRECLAY REFRACTORIES

IN 1865 Harbison-Walker Refractories Company, then known as Harbison-Walker Company, commenced operations with a single plant, located in the city of Pittsburgh, Pennsylvania. This original plant had a maximum capacity of only thirty-five thousand brick per day. Today, Harbison-Walker Refractories Company is the world's largest producer of refractories.

DEEPLY significant from the viewpoint of the user of refractories are the policies responsible for the growth of Harbison-Walker.

- From its inception, Harbison-Walker has sincerely endeavored to establish and maintain a constantly improving standard of quality.
- To this end the company has initiated many advances in the art and has availed itself of every improvement in production methods and machinery.
- By means of scientific research, refractory materials have been developed or adapted to meet the changing demands of industry.
- Carefully standardized procedures have been adopted for the inspection and testing of all raw materials and finished products.
- Constantly improved manufacturing methods have kept Harbison-Walker abreast of the ever-increasing demands of industry.
- An extensive building program has made every plant a model manufacturing unit.
- Flexibility of operation has been secured by the use of both periodic kilns and the more modern continuous tunnel kilns.

THE PLANTS at which Harbison-Walker manufactures fireclay brick are situated in Pennsylvania, Ohio, Kentucky, Alabama, Texas and Missouri. The clays used are taken from mines in those states and in Georgia, and embrace a wide variety of high-grade flint, semi-flint, and plastic bond clays. Brick are made by three processes, known respectively as the Hand-Made, the Extrusion or Steam-Press, and the Power-Press process. Each of these processes produces brick of characteristic texture.

AN IMPORTANT development of recent years is a method by which a high vacuum is applied during the forming of brick made by the Extrusion or by the Power-Press process. Brick made in this way are tougher, stronger, less porous, and of course heavier than brick made in the usual manner. As a consequence they are more resistant to impregnation and corrosion by slags, to abrasion, and to penetration by gases. For these obvious reasons the process of manufacture seems of particular value in the production of blast furnace linings and of checker brick.

THE PRODUCTION of super-duty fireclay brick is a relatively recent development, based on extensive research. The outstanding characteristics of this class of brick are excellent resistance to spalling, low porosity, and unusual strength and constancy of volume at high temperatures. Super-duty fireclay brick contain about one-tenth more alumina than do brick of the high heat duty class, and their softening point (as measured by the Pyrometric Cone Equivalent) is 35° to 100° F. higher.

REFRACTORIES FOR INDUSTRIAL FURNACES

HARBISON-WALKER products comprise refractories of various types and of widely differing properties, and include fireclay, super-duty fireclay, high-alumina, silica, magnesite, chrome and forsterite brick, acid-proof brick, and insulating fire brick. Included also are fire clays, silica clays, various other clays for special purposes, chrome ore, special furnace chrome, furnace magnesite, dead-burned grain magnesite, high temperature bonding mortars and bulk insulating materials.

With a complete line of furnace refractories and insulating materials, Harbison-Walker is able to recommend and furnish the correct combination for any service requirement.

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AND SUBSIDIARIES

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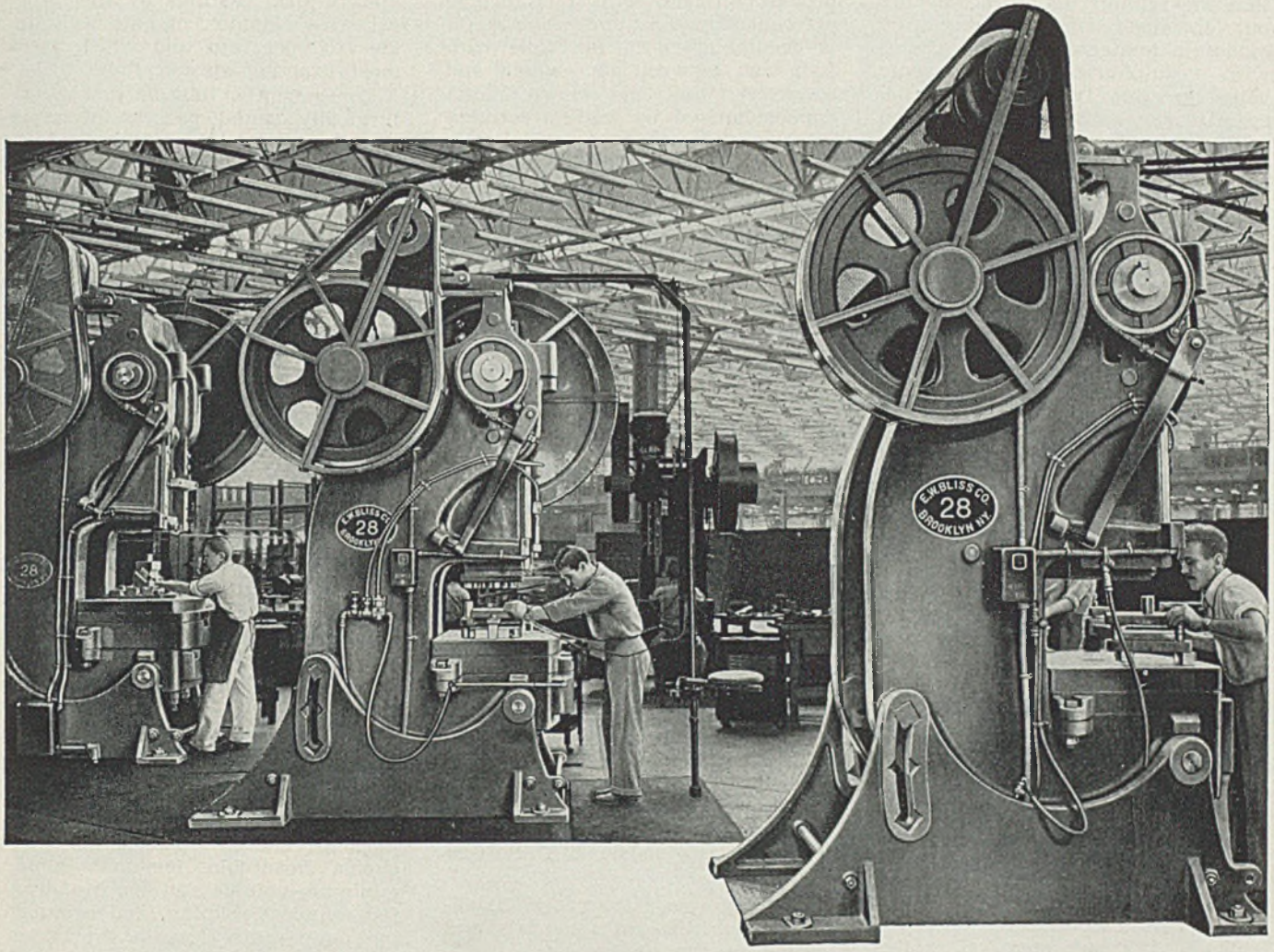
GENERAL OFFICES: 1800 FARMERS BANK BUILDING, PITTSBURGH, PA.



Peak PRECISION *Production*

WITH industry keyed to the war effort, and government constantly setting up new production goals, the need for precision equipment becomes more and more acute. Five American plants with a background of 85 years machinery building experience enable Bliss to play a prominent part in supplying Uncle Sam's industries with metal working equipment.

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that the refining action in washing out entrained slag or unreduced oxides in molten iron which comes with desulphurizing is of some value on every type of iron foundry mixture whether all-scrap or 100 per cent pig iron.

Duplexing Process

At outlying plants not having hot metal, cupola-open hearth duplexing offers the means of quickly increasing the output of ingots by upward of 20 to 25 per cent. This process is now in use at two plants with others under construction. Building and equipment, including cupolas, holding and desulphurizing ladles, and other auxiliary equipment for supplying metal for three or four 100-ton open-hearth furnaces can be installed for about one-half the cost of similar open-hearth furnaces and in about one-third the time required for building a new furnace of this capacity.

At most locations costs of ingots compared to costs with cold charging will not vary greatly. This process does, however, offer the advantage of adding flexibility both as regards raw materials and output.

Triplexing Process

Another recent development in rapid metallurgy, making use both of desulphurizing and dephosphorizing by ladle treatment, includes cupola - converter - electric furnace triplexing. This system offers the means of more than doubling the output of electric furnace units within a minimum of time and expense for buildings and equipment.

In this process low-grade steel scrap unsatisfactory for either open-hearth or electric furnace charging is melted in the cupola with pig iron or ferrosilicon to provide an iron with 1.25 to 1.50 per cent silicon content. The metal is desulphurized in the ladle with soda ash between the cupola and converter; and the blown metal dephosphorized by ladle treatment between the converter and electric furnace. Upwards of 70 per cent or more of either or both sulphur and phosphorus in the iron is removed by ladle treatment.

Equipment for the process is installed at much lower cost and in considerably less time than required to build and install similar electric furnace capacity. It is believed that ingot costs by this process compares favorably, both now and under postwar conditions, with cost of ingots of comparable quality made with cold charges. The process is to be used in the production of plain carbon and alloy steels or ordnance grades.

Converter Steel Castings Return

Prior to the advent of desulphurizing cupola iron by ladle treatment and the practice of melting high percentages of steel scrap in the cupola, converter steel foundries were limited to the use of high-priced raw materials. Even with the best available materials, it was impractical to produce castings by the converter process with sulphur contents below 0.07 to 0.09 per cent.

Although until recently handicapped by high-cost materials and limited to the production of relatively high-sulphur steel, the converter process has continued to fill a gap in the steel castings industry.

With the development of desulphurizing and advancements in cupola melting practice, it is now possible to use an all-scrap steel and ferrosilicon charge in the cupola and produce uniformly high-quality steel castings by this process with sulphur contents well under 0.05 per cent and which meet most exacting specifications.

Consequently, this old and metallurgically sound process of rapid metallurgy which was all but advertised out of existence by the electric power companies a few years ago, is now coming back strong.

An increasing number of gray iron foundries are installing converters and switching over from gray iron to the manufacture of light and medium steel castings as a means of keeping their plants going—and from all accounts are doing a good job.

Develops U-Shaped Ladles

Development a few years ago of the U-shaped mixer refining ladle with cover and insulation has served to extend refining in the gray iron industry to an increasing number of foundries during recent years. This type of ladle is not adapted to maximum per cent desulphurization but is particularly efficient as a mixer refining ladle; and by providing a continuous supply of refined metal is well suited to production foundries where, for best results, the extent of sulphur reduction is usually limited to some 25 to 40 per cent.

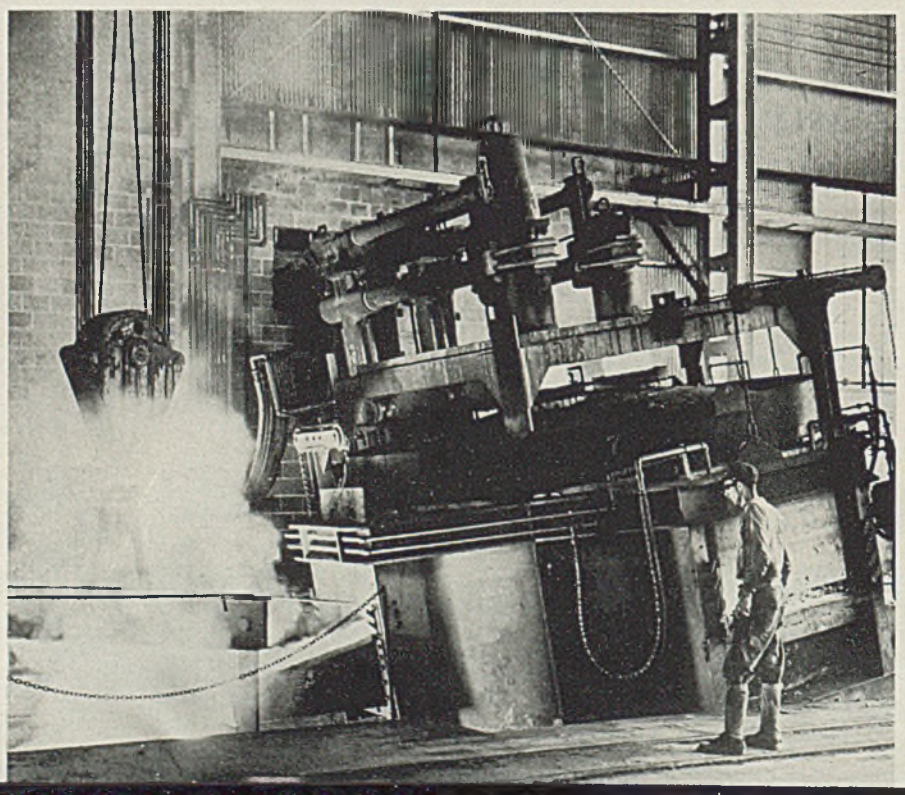
These ladles require minimum cupola headroom for installation, minimum volume and depth of iron for complete refining, and by holding temperature loss in the mixer ladle to a minimum, make the refining equally practical for heavy or light castings and for foundries melting 2 or 3 tons per hour.

The iron from the cupola and the refining agent enter the ladle at one end, and the refined iron is drawn off from the bottom of the ladle through a teapot spout at the far end. This restricts agitation of the bath due both to the stirring action of the stream and the violent boiling action set up by the reagent to one end of the ladle. Entrained impurities are converted into liquid soda slags which rise out of the bath as the iron travels across the ladle; thus providing a continuous supply of quiet desulphurized and refined iron at the teapot spout.

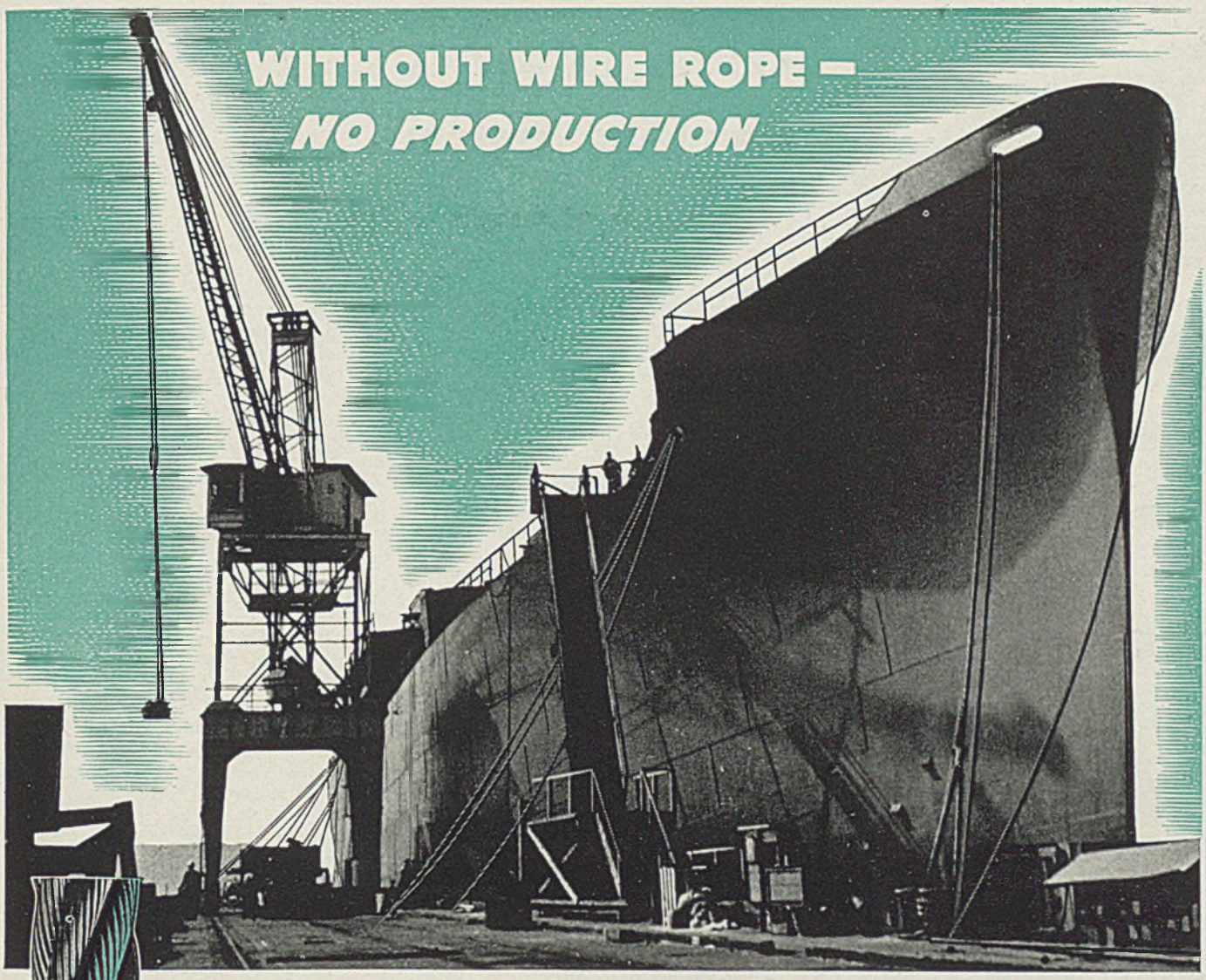
Soda Ash in the Cupola

There has been a gradual increase in the use of soda ash in the cupola during the past few years. This use of soda ash has been held back by fear of cutting action of soda slags on the cupola lining. It has now been proven, however, that with the proper application in the cupola, particularly

(*Please turn to Page* 111)



Type of electric furnace used for making steel by the triplex process



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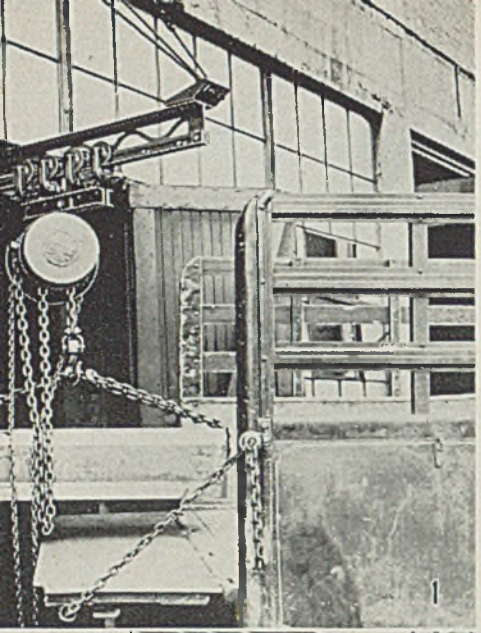

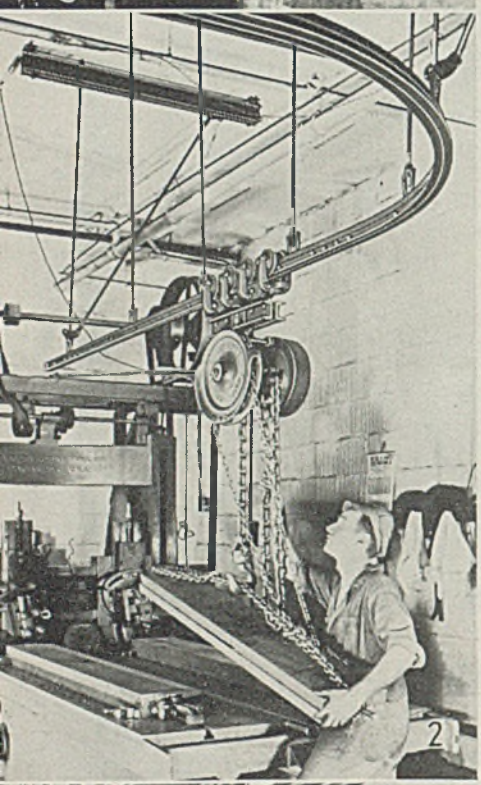

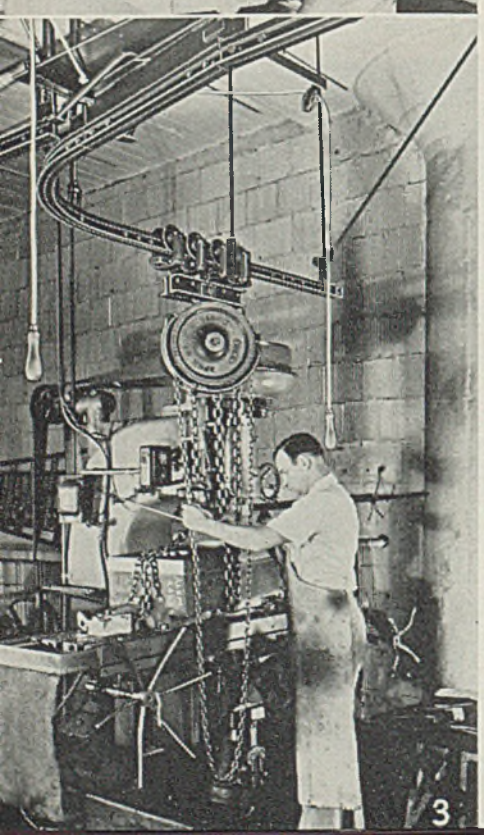

MONORAIL

Handling System

. . . . saves time and money in die shop

TWO AND three-ton die blocks are handled by an overhead monorail system aided only by one portable floor crane with hand chain hoist from the time they arrive at the I. J. Frindt Co., 13000 Athens avenue, Cleveland, until they are delivered as finished dies for aluminum forgings.

The blocks are carried on chain hoists to planer, router and other machines in the plant, which are served by monorail tracks branching off the two main tracks. Operators are saved much time by this system since they are able to place the blocks directly in work position on their machines. Since there is much back filing of the dies between the machine operations, there is a great deal of handling per block before a finished die is delivered. As every employe in the shop is a skilled worker, it has been found much cheaper to invest in labor-saving equipment than to pay the toolmakers for lifting and carrying heavy die blocks.

Monorail For Each Wing

This plant is composed of two wings, identified in diagram Fig. 4 as A and B. Each wing is served by a main monorail track designated by the same letter. Wing A is devoted to heavy machining operations, while layout and bench work are done on the dies in wing B. Branch monorail tracks C and D permit the die blocks to be carried by hoist to the large and small planers respectively. Branch E extends above milling machine shown in Fig. 3, and Branch F connects the unloading area with the main monorail tracks.

The monorail track F extends outside the building over the unloading area so the die blocks can be picked up directly from the delivery trucks by the hoists. Fig. 1 shows a heavy-duty spur-gear chain hoist supported by four sets of trolley wheels unloading a die block from a truck. The eight trolley wheels distribute the heavy load along the monorail to prevent excessive unit loads at any one point. Large blocks are carried either to planer storage or directly to one of the planers in wing A by way of branch C or D of the monorail system.

Branch Tracks For Machines

Fig. 5 is a general view in wing A (taken from the point marked "X" on the diagram, Fig. 4) before branch D of the monorail had been installed. On the left can be seen two lathes and on the right two rows of milling machines, the latter being served by the main monorail track A. Branch track C leading to the large planer also can be seen at the rear of the room. Note heavy-duty hoist on track A. See Fig. 3 for a closeup view of the vertical miller visible in the background at the extreme right of Fig. 5.

In Fig. 2 a die block can be seen being placed on the bed of the large planer. Note how the monorail track extends above the planer bed so hoist can position the die block on the machine without any manual handling of the work.

After completion of the planing operations, blocks are taken to the drill press, served by the monorail track A. A portion of this press can be seen in the center background of Fig. 5. Small blocks are taken directly from the delivery trucks to this drill press. After the drilling operations, all blocks go to the layout and bench room, wing B, which is equipped with portable drills and other hand tools.

System Is Flexible

Next, blocks come back to the die sinkers or milling machines in wing A. Fig. 3 shows a die being positioned on the vertical milling

Fig. 1—Die blocks arrive in trucks and are unloaded by heavy-duty spur gear chain hoists by means of the monorail track which extends outside the building over the unloading area. Note the four sets of trolleys supporting hoist

Fig. 2—Hoist is positioning die block on the large planer bed

Fig. 3—Section of main track has been swung over against branch track E so hoist could be run out over milling machine. Movable track section is positioned by two handles suspended on either side of the main track. Movable section could now be returned to the main track, permitting main track to be used while work is being processed from branch E

"Damn the torpedoes! ... full speed ahead!"

WHEN FARRAGUT stormed into Mobile Bay, his was a stirring watchword. "Damn the torpedoes! Full speed ahead!" Those are fighting words . . . to set the pace for a fighting nation.

And in every mine, factory, mill, or industrial plant, Farragut's cry must be remembered. Damn the *difficulties!* Full speed ahead! America needs ores, minerals, and armament. Our men at the fighting front must lay down a curtain of fire against a determined and treacherous foe. From now until final Victory dawns . . . we'll keep going at full speed to help *Keep America Rolling.*

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Double application of the ROPER principle

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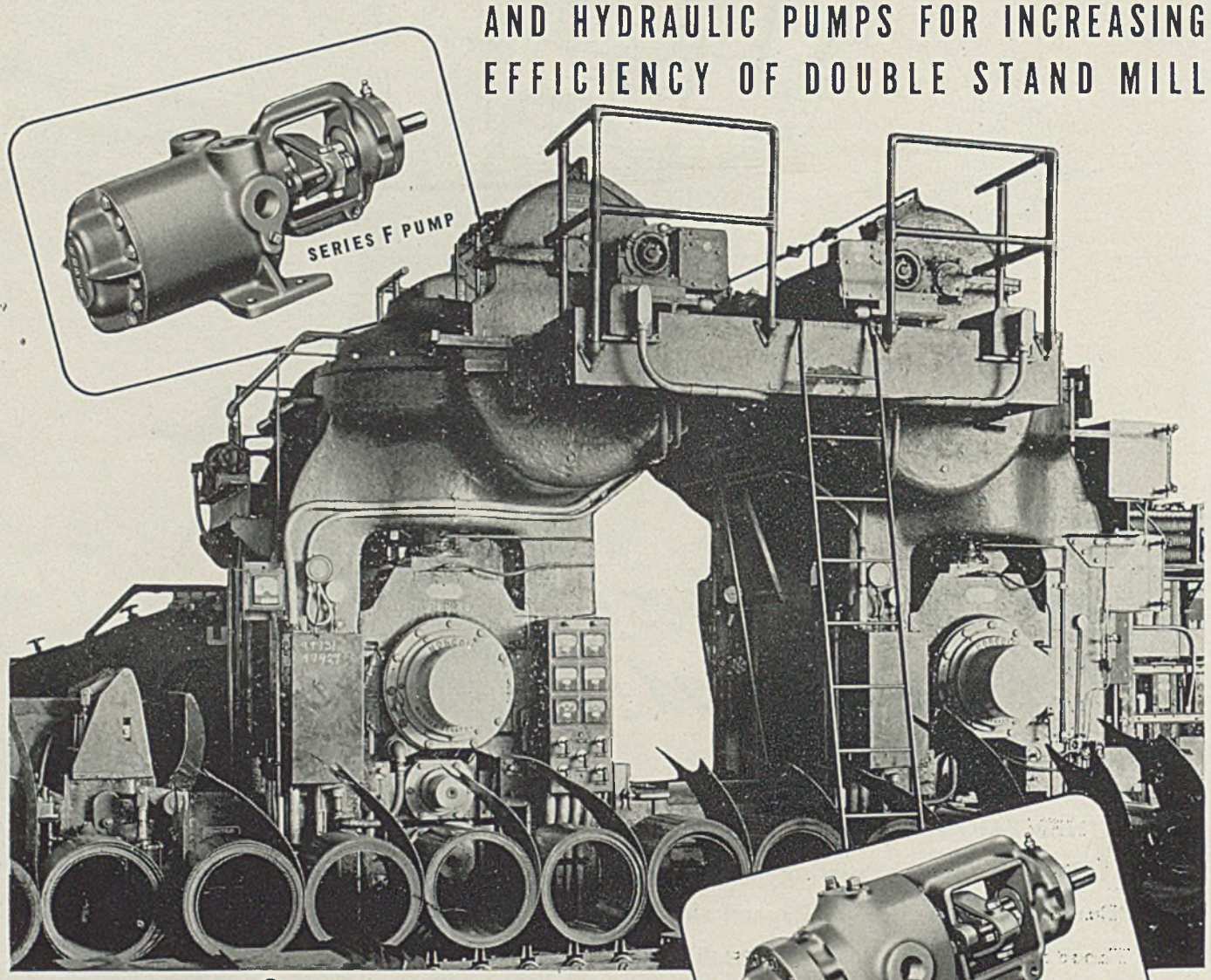

ROPER *Rotary* PUMPS

Space-saving direct drives eliminate belts and pulleys. ROPER PUMPS, when installed, become integral parts of the machinery they service. The double stand mill pictured here is served by two ROPER PUMPS: one lubricates the screw downs, and the other effects hydraulic actuation of feed reels and roller balance. Features include hydraulic balance, increased efficiency, silent operation, small space requirements, operation by direct motor connection. ROPER ROTARY PUMPS have *only two moving parts,* yet they produce the very maximum in mechanical and volumetric efficiency. There are hundreds of standard models; from these you can select practically a custom-built pump to handle your particular job. Catalog 948, with illustrations, cut-away views, drawings, dimensions and pumping capacity tables will aid you; write for it now. It is definitely helpful literature.

HYDRAULICALLY BALANCED

THIS SEAL appears on every ROPER "Hydraulically Balanced" PUMP. It assures higher efficiency, quieter operation, greater dependability and longer life.

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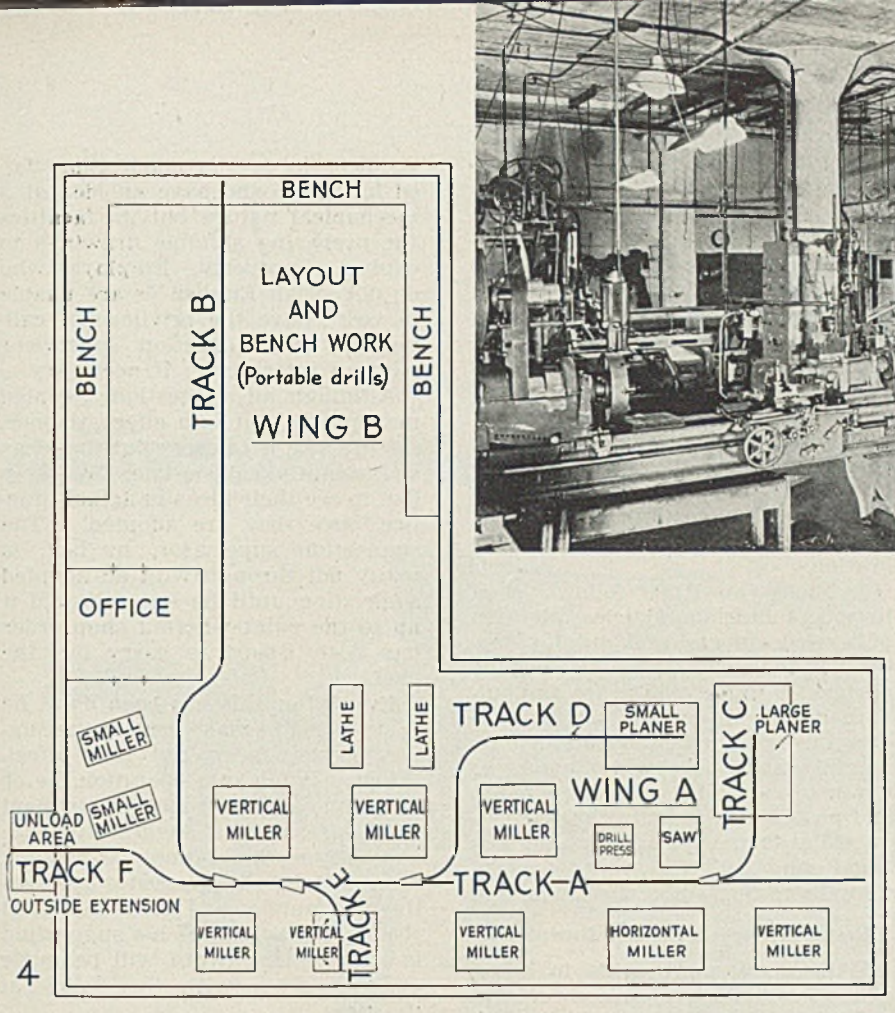


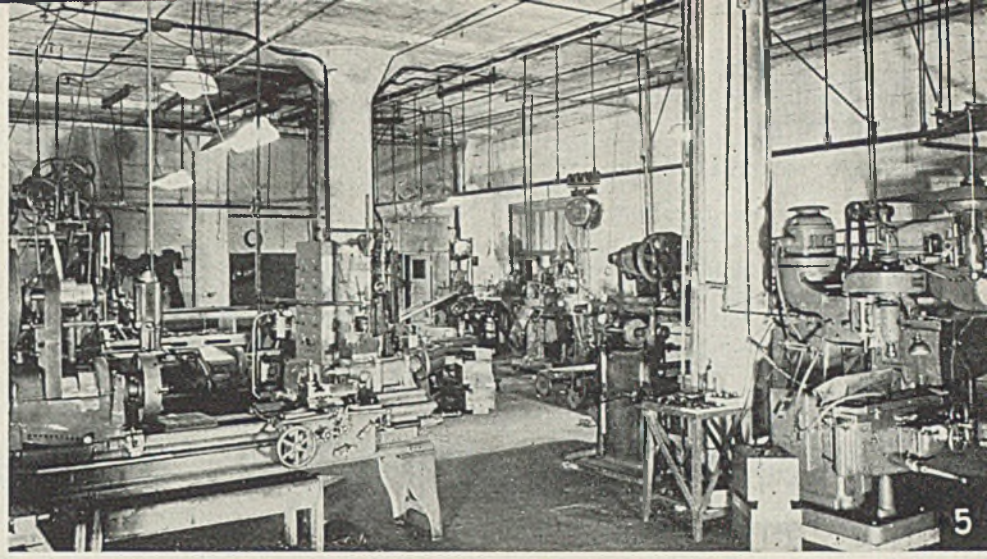


Fig. 4—Floor plan diagram of Frindt Mfg. Co. plant

Fig. 5—Heavy machining operations on the die blocks are performed in wing A. This view was taken from the point near track E on diagram Fig. 4 before the installation of branch D of the monorail track. Tracks A and C are visible along the side and end of the room respectively. Note hoist on track A. The milling machines on the right are served by track A, and the two lathes on the left and the small planer behind them are reached by track D

machine beneath monorail branch track E. The switching mechanism employed to permit hoists to be run out onto branch tracks is clearly shown in this view. One end of a movable section of the main track swings over against the end of the branch track extending over the tool. Hoist and load can then be run onto the branch track and main track section swung back to permit main track to be used while block is being supported and handled on the branch track.

The position of the movable section is controlled by pulling handles which can be seen hanging from either side of it.

All monorail equipment furnished by American MonoRail Co., Cleveland.

Automatic Spray Pickling (Contd. from Page 78)

acid which ordinarily would be required to pickle the same amount of work in the same time in a dip tank.

Hydrochloric acid also can be used. A strength of about 15 per cent given by a 50 per cent dilution of commercial muriatic acid is recommended when no heating is employed. Obviously, such a setup can be used to pickle, wash and dry objects made of any metal which can be pickled by either of these acids.

Automatic spray pickling units of the type described need not necessarily be made a structural part of an annealing furnace for the arrangements of equipment are such that no fumes emerge from either end of the chamber. It is evident, however, that combining the equipment with the annealing furnace affords economies in handling and loading the work and so offers most advantages.

The present equipment is designed for handling shell in sizes of 37-millimeter or larger. It includes the necessary pumps, filters, annealing furnace and pickling unit combined into a single piece of equipment.

Can Be Set Up Quickly

When installed, such a plant is ready to operate in a short time. The average pickling period in a sulphuric acid solution is 4 minutes. In the majority of cases, the complete operation of annealing, pickling, cleaning and drying can be handled in less than 100 minutes. When set up with a continuous conveyor-type furnace, obviously the capacity is quite large. The same furnace setup can be utilized for annealing steel shell bodies as well as brass cartridge cases.

To lay out a plant for such equipment, it is only necessary to know the production requirements, the size of shell and the material to be handled as well as the heat treating cycle desired. As previously mentioned, such a setup is also well suited for annealing and pickling many items other than shell components.

Spray pickling features a number of important advantages which can be summarized under five headings: A considerable saving in cost of pickling a given quantity of work; a saving in time; more efficient pickling owing to a marked increase in activity of the pickling solution afforded by the mechanical force of the impinging jets; absence of spray or fumes around the equipment, enabling such pickling equipment to be placed alongside presses or other equipment instead of in a distant, highly ventilated department, thus saving considerable handling of material and delay in process. A marked saving in the quantity of acid required is also experienced.

Campaign Ups Production

(*Continued from Page* 80)

ter is reconsidered, and then if there is still the slightest question in the suggestor's mind as to the fairness of the decision, it is put through the same routine again, but usually with a different investigator so as to insure a fresh viewpoint. Not infrequently the suggestor is able to throw further light on his idea, which helps in any further investigation.

Awards ranging from $2 to $15 are made by the foreman; $16 to $25 by the superintendent; $26 to $50 by the division manager; $51 to $75 by the general manager; and $76 to $100 by the president. Needless to say, an employe improves his chances for promotion in addition to awards he receives.

Essentially the success of the plan is due to the employe's conviction that the plan's objective is to improve the company's business and its competitive status, thereby making his own job more secure and increasing his chances of better pay. These facts should be made clear to all personnel.

Also, it is stressed that every contact with employes regarding the plan should be made on a personal, man-to-man basis, always assuring the individual that all suggestions will be given fair and careful consideration by impartial, competent judges—whether his idea is adopted or not. It is essential, too, that supervisors, executives and others understand the value of the suggestion effort so as to give their wholehearted co-operation because, as is the case in any other employer-employe activity, these men can make or break the plan.

Although it is pointed out that the best responses usually come from those supervisors who are most enthusiastic about the plan and who do their best to stimulate interest among the men, it is nevertheless advisable to offer prizes or give special recognition to supervisors and executives of departments from which the most valuable suggestions are received.

Well-balanced and sustained publicity is much to be desired since the objectives of the suggestion system are many fold. Briefly, publicity should: Inform employes regarding the operation of the plan, its aims, purposes, methods and benefits; cultivate proper attitude; stimulate interest; urge the employes to offer suggestions; guide employe thinking; direct attention to subjects upon which suggestions are desired; and develop confidence and co-operation.

Publicity at RCA follows such lines as editorials, articles, pictures of award-winners and similar features in the company's house organ; posters on suggestion boxes and bulletin boards; individual distribution of mimeographed material; departmental and plant-wide contests; newspaper publicity; posters made and posted by the individual department heads or supervisors; and personal congratulations by top executives to major suggestion winners.

Recognition—A Strong Incentive

With many men, pride in being able to contribute a successful suggestion meriting recognition by the company may be just as strong an incentive as an actual award. But, the novelty may wear off. Therefore, company officials believe it is better to appropriate definite, immediate and adequate financial awards. These supply the strongest incentive.

A point is made that it is important to give full help to all employes who need it. And when an idea is involved which requires considerable time to develop for proper consideration, provision is made whereby the suggestor may file it by subject or outline to protect himself against the possibility of some other person's submitting the same idea and getting credit for it.

Provided by the plan supervisor or others when requested, this help, needless to say, is much appreciated by those who have an idea of a mechanical nature but no facilities for preparing suitable drawings to explain it properly. Employes who do not speak English or are unable to write have the privilege of calling on the suggestion supervisor with an interpreter; if necessary.

Although all suggestions adopted may not be put into effect at once, the practice is to carry out the ideas as promptly as possible. Workers like to see their ideas in actual practice, once they are adopted. The suggestion supervisor, in fact, is really not through with an adopted suggestion until he has followed it up to the point where a shop order has been issued to carry out the idea.

Even after this has been done, he is supposed to make certain the suggestion has been put into effect. When it is put into operation, he or the employe's immediate department head informs the suggestor. If a good suggestion cannot be adopted immediately, the suggestor receives the minimum award and is informed that when, as, and if his suggestion is adopted, an award will be made commensurate with the policy at the time.

The suggestion system, especially when the suggestions are submitted unsigned may be used by some workers as a convenient method for forwarding complaints to the management. Consequently, when such complaints are found to be honestly offered, well grounded in fact, and when the forwarding of a complaint leads to actual improvement, the customary practice is to give the suggestion the same serious consideration received by suggestions that are signed.

At times when bad feelings exist between workers or between workers and their foreman, unsigned statements of an abusive or slanderous character may be received concerning certain employes. However, such misuse of the suggestion plan should not necessarily be regarded as a serious objection. Communications of this kind are han-

(*Please turn to Page* 108)

Fig. 10—Suggestion blank contains two stubs. Worker keeps stub at extreme left. Suggestion collector keeps second stub under lock and key until suggestion has been acted upon

IDENTIFICATION STUB

TEAR OFF THIS STUB *and* SAVE IT

It is your record that this suggestion was made by you. You should receive an acknowledgement from the Suggestion Committee about four days from date of submission. IMPORTANT: This acknowledgement will contain the Suggestion Committee's Special Serial Number of your suggestion. Make note of this number as it will be used in all correspondence concerning your suggestion.

Write the subject of your idea on the back of this stub for future reference.

Date.....

V 176650

V 176650

Paid Weekly ☐ Paid Semi-Mo. ☐

Name..... Floor..... Department No.....

Bldg. No..... Date.....

Clock No.....

This stub will be torn off by a special collector who will file it confidentially under lock and key. Its purpose is to further safeguard your suggestion. It will not be made available until AFTER a suggestion has been acted upon.

DO NOT TEAR OFF THIS STUB

A "BEAT THE PROMISE" SUGGESTION

"LET'S GO TO 'BATT' FOR MAC ARTHUR"

Think your Suggestion through. Be explicit. Tell what it will do if it is adopted.

SHOP ORDER:..... DRAWING No.....

DATE.....

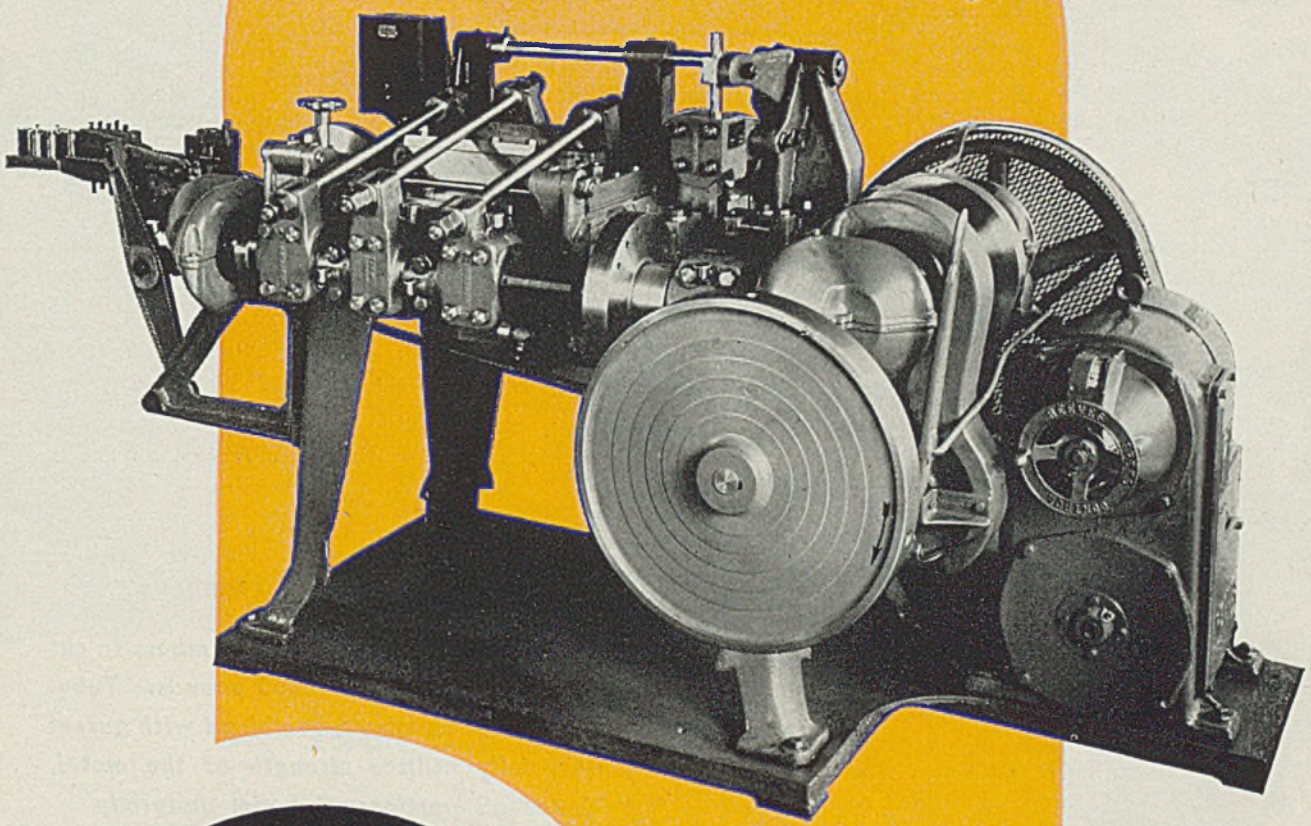
(*Please* DO NOT *write on reverse side — Use additional sheet of paper if necessary.*)

RCA MANUFACTURING COMPANY, INC. Form 19689

V 176650

NILSON

automatic metal wire forming machine

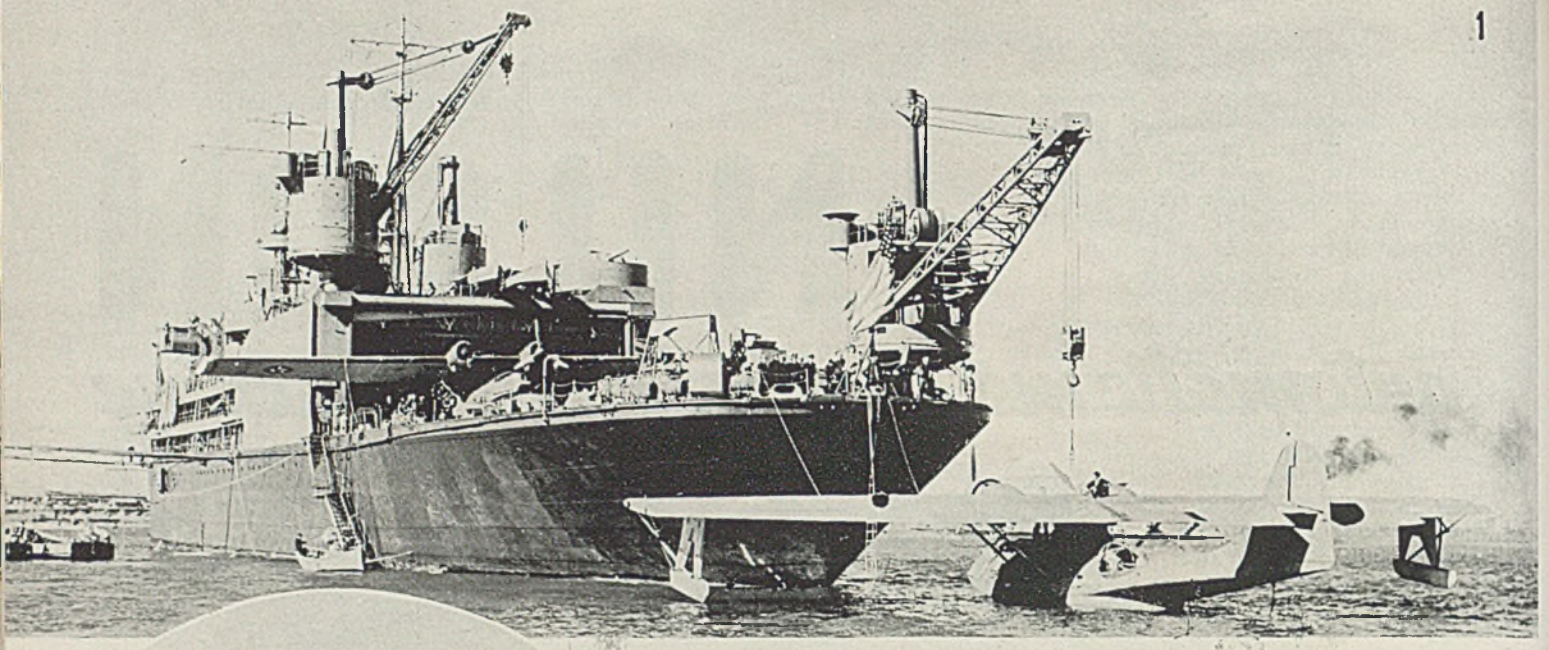


The Nilson line includes machines for forming paper clips, buckles, gate hooks, coat and hat hooks, ceiling hooks, wire ears, cable rings, screw eyes, sash chains, automobile slide chains, flat open link chains, staples, cotter pins, hose clamps, etc. Nilson also makes wire straighteners, wire reels, frame bending machines and special presses.

The machine pictured here is a simple and ingenious contrivance. Sturdy, solid, compact, requiring little space, it is a highly efficient and practical machine for forming wire and punching patterns from ribbon stock. Various patented features and extra attachments make it a necessary factor in reducing the manufacturing cost of your product. The Nilson automatic metal wire forming machine turns out the work faithfully, accurately and speedily—and it functions a long, long time free from repairs and replacements.

THE A. H. NILSON MACHINE COMPANY

BRIDGEPORT, CONN.



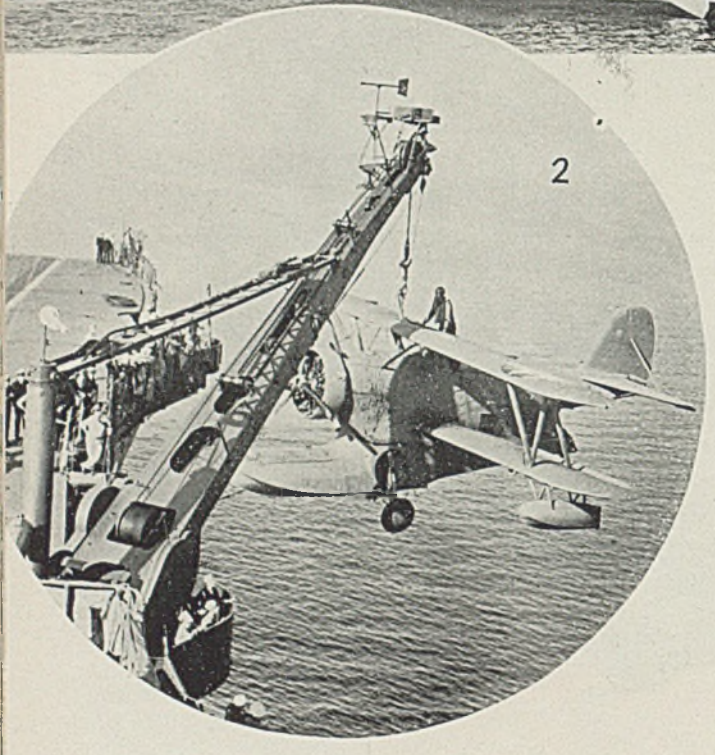


Fig. 1—This seaplane tendor is hoisting a patrol plane aboard, using one of the tubular welded crane booms. Another boom further to the left is placing a small boat in position. (International News Photo)

Fig. 2—A crane boom of the plate box-girder type is shown here on the USS Lexington. Although this design employs a highly efficient distribution of material, the tubular construction is an improvement permitting reduced weight (Press Association Photo)

Boat Crane Booms

. . . . are welded from tubular members to cut weight of typical boom 6000 pounds. Tubular section of members, combined with gusset plates, fully utilizes strength of the metal, loads all portions of boom uniformly

SINGLE steel tubes have been used for quite some time for crane masts and booms for various kinds of marine service. The statically perfect cross section of the round tube makes it theoretically the most efficient shape to use because it develops the maximum resistance to buckling with a minimum of weight. However, the practicable sizes of single-tube booms are limited by the resisting moment at the base and by the permissable deflection. A logical development was the design of booms of the plate box girder type for naval service, where loads are very heavy, the spans are relatively short, rigidity necessary.

Although the plate box girder, Fig. 2, embodies a highly efficient distribution of material, an improvement has been found in the more recent design of boat crane booms in the form of a box truss having tubular members. With a view to reducing the weight of these booms without sacrifice of either load capacity or rigidity, engineers of the New York Shipbuilding Corp., Camden, N. J., developed a general design which is typified in the all-welded tubular boom shown in Fig. 1. The design was approved by the Bureau of Ships, United States, Navy, and booms have been constructed in sizes suitable for tenders, battleships, and aircraft carriers.

Selection of sizes of the tube members was governed by stress analyses based on the theory of statically indeterminate space framework, and using the Moncrief formula for allowable unit stresses for compression members. This procedure almost constitutes an innovation in the construction of tubular frames because in the limited use that has been made of tube sections for important loadings, practice has generally been to select a pipe size which was obviously of sufficient area and to be satisfied if the resulting structure sustained the necessary load without failure. The more exact calculation of the tube components is a forward step which will doubtless be emulated.

With permission of the United States Navy, officials of the New York Shipbuilding Corp. have made available the basic information which is pertinent to the design and construction of these booms. Tests conducted by engineers of the United States Navy Model Basin have verified the soundness of the design, and the service records of this type of boom have been thoroughly satisfactory since 1933.

The general design of the boom illustrated is a rectangular box truss, the horizontal section being deeper than the vertical section. Vertical members taper from a point near the middle toward both ends, while the horizontal member tapers from the base toward the tip. Plate stiffeners, reduced by lightening holes, are inserted in end panels. Closure of the horizontal members is by a plate bent to a semicircle. Gusset plates

Here's a 48 to 60 hour week —by working 40 hours!

Everybody says our greatest shortage in the war program is TIME. Here's how to get the welding output of 48 to 60 hours with no more effort and no more time than 40 hours.

ALTER EGO: And how simple! Just select the proper electrode, use the new "Fleet-Fillet" Technique, boost the current—then speed like blazes!

Speed is right! At 50% operating factor, I used to make 15 feet per hour on these 3/8" fillets. Now, with this new "Fleet-Fillet" Technique, I'm getting 30 feet per hour. Twice as fast!

ALTER EGO: And look at the weld metal you save! All in all, the boss says this new technique has cut welding costs more than 50%.

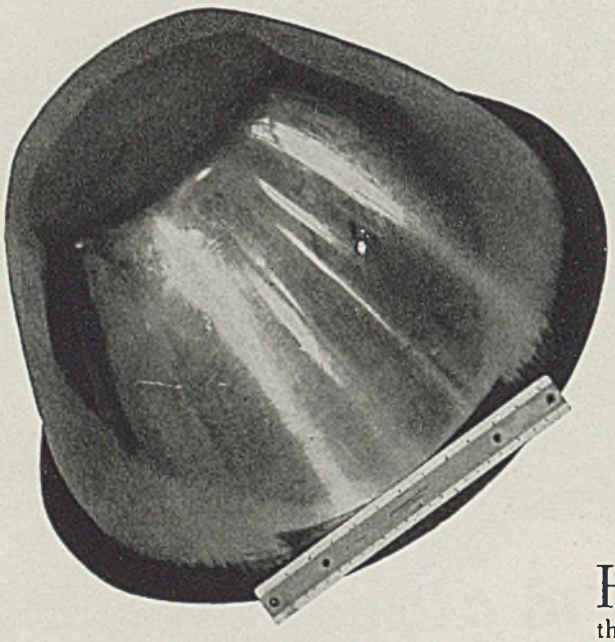
That's why every welder, supervisor, engineer and executive in metal-working industries should air mail a letter to The Lincoln Electric Company, Cleveland, Ohio, for their book on the new "Fleet-Fillet" Technique so that they can put this time saver to work for Uncle Sam at once.

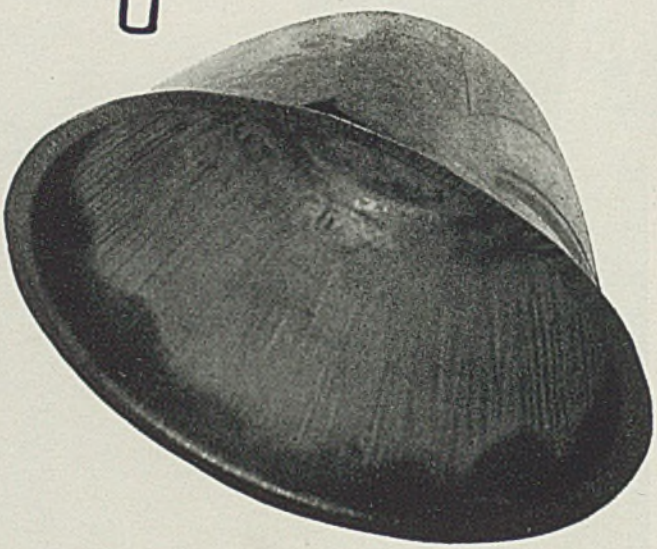
Free copy "Fleet-Fillet" Bulletin No. 432 on request.

THE LINCOLN ELECTRIC COMPANY
CLEVELAND, OHIO

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

Cecostampings





PROPELLER SPINNER. Made of stainless steel on a 66" x 48" CECOSTAMP. Rubber rings used extensively for the deep draw.

THE CECOSTAMP
The modern drop stamp for difficult forming of high strength steel and aluminum alloy sheet metal parts.

HIGH STRENGTH metals, such as stainless steels and many aluminum alloys, present a forming problem that taxes the most modern type of stamping machinery. Many forms cannot be drawn without a great deal of difficulty—other forms must be shaped without drawing as no reduction of section is permitted!

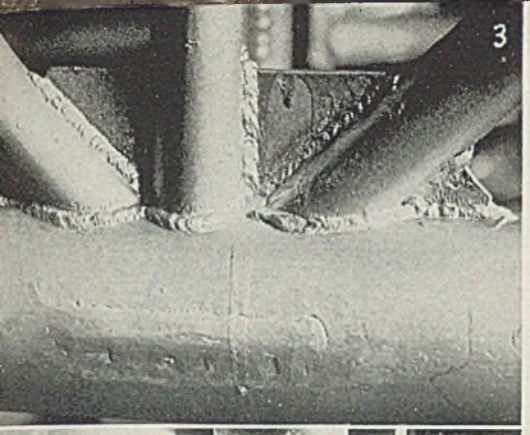
The Cecostamp provides a means for forming these difficult metals with fewer operations and greater true-to-die accuracy. The Cecostamp permits the operator to control the metal flow of stamping and thus produce shapes without drawing and the reduction of sectional areas.

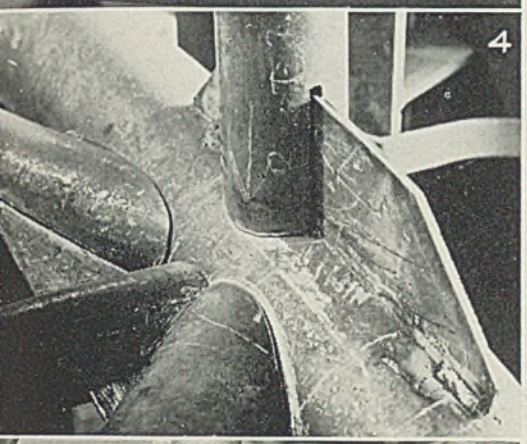
Controlled stamping overcomes the resiliency of these hard-to-form metals and gives them a permanent set at a greater rate of production.

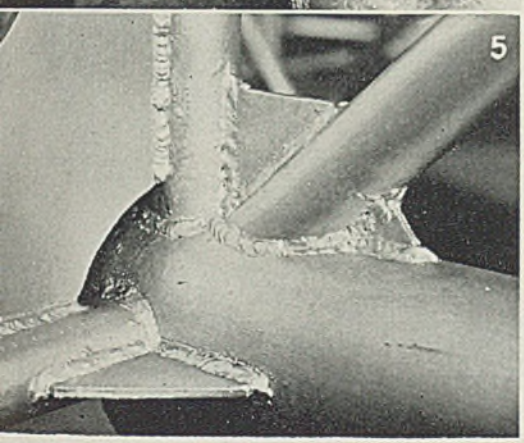
A new publication, just off the press, shows examples of Cecostampings and details of their production. Just write for a copy of "Cecostampings".

Chambersburg Engineering Co., Chambersburg, Pa.

CHAMBERSBURG
★CECOSTAMP★
HAMMERS PRESSES







are introduced to stiffen all joints where diagonals and cross braces connect with cord members. See Fig. 4. In the vertical truss members, the gusset plates are welded to the near wall of the chord tube only, but the chord tubes are slotted so that gusset plates for joints of the horizontal members can be inserted and welded to both the near and far walls.

Tubing used in the construction of these booms meets United States Navy Specification No. 44T1c (Structural Tubing), which conforms to the following analysis: Carbon, 0.31 per cent; manganese, 0.5; phosphorus, 0.045; sulphur, 0.055; silicon, 0.30; nickel, 0.25; copper, 0.25; other elements, 0.25. All figures are maximum values permissible. This tubing has a minimum tensile strength of 60,000 pounds per square inch and an elongation of 25 per cent in 2 inches. For compression members United States Navy specifications allow a unit compressive stress of 15,000 pounds.

It was advantageous to consider tubing for this application partly because of the much wider range of sizes from which to select the section with the most favorable radius of gyration, and partly because the material is of somewhat better quality. Both of these considerations are influential in attaining the objective of reducing the weight of structure. Fig. 1 shows the boom.

The size of the crane booms and the large number of component parts involved in their construction justifies the allocation of a large portion of one shop boy to this work. See Fig. 6. Here are the equipment and personnel for all of the cutting, forming, assembly and working operations. The entire construction has been studied closely and a systematic production followed.

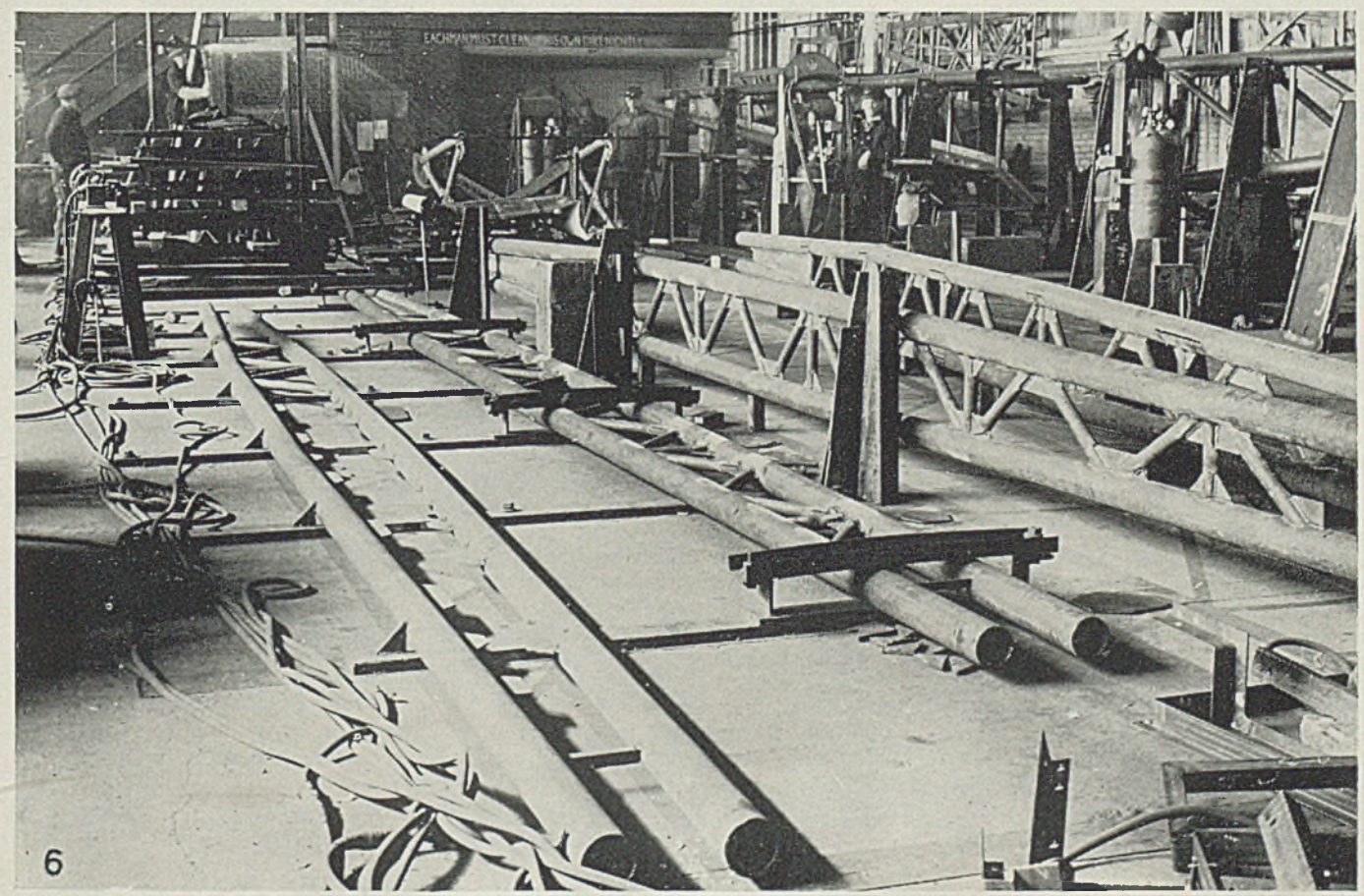
Tube ends which have to be profiled in order to fit into composite joints are prepared by first using wrap-around templets to lay out the cuts. Hand gas torches make the first cut; then the finishing and beveling are done with portable grinders. Selection of grinding wheels shaped to the size of the larger tube facilitates the production of well fitted joints for welding. Slotting of the tubes to receive the

Fig. 3—Finished joint of the type shown as No. 1, Fig. 9

Fig. 4—Closeup of assembly of multiple tube joints in two planes showing preparation of tube ends, use of gusset plates or reinforcing fins, and final fitup. One more tube end is still to be fitted over the upper fin here

Fig. 5—A finish welded multiple tube joint employing welding fins (gusset plates) and reinforcing web between members of the two planes

Fig. 6—Shop where booms are fabricated. Steel beams are embedded in the concrete floor to serve as grounds. To them are tackwelded the components of the assembly jig, forming a semipermanent jig which is extremely rigid. Guide marks are painted on the floor to show size and location of all elements entering into the assembly



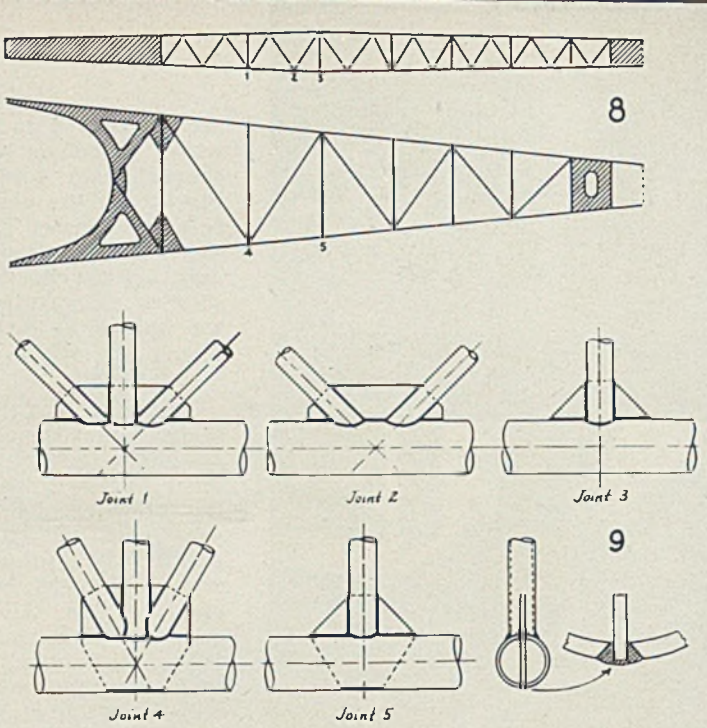


Fig. 7—Here are two completed vertical members set up ready for welding in the horizontal members. Note the markings on the floor which guide the fit-up crew in placing each tube correctly. Tubes are slotted for gusset plates

Fig. 8—Upper section is elevation outline of the tubular structure in a boat crane boom. Lower section is plan view of same unit

Fig. 9—Typical joint designs as employed in the tubular boat crane boom

gusset plates, Fig. 4 is also done with the gas cutting torch.

As shown in Figs. 6 and 7, the shop floor is the assembly jig. The floor is level and smoothly finished. Imbedded in the concrete surface are a series of H-beams set so that the top surfaces of the flanges are flush with the floor surface and all carefully grounded. Truss drawings are painted on the floor, tubes in black and gusset plates in orange, with the dimensions of each piece clearly indicated. Small plate cut-outs are welded to the steel floor beams to serve as positioning and holding pieces. The marking is so complete that the workmen can see at a glance exactly where each piece goes and what the proper dimensions are. This jigging is so rigid that nothing short of an earthquake could disturb the alignment.

Usual sequence is to weld two vertical truss assemblies, Fig. 6, then set these over the horizontal layout, Fig. 7, where the additional lacing tubes and gussets are inserted to complete the tubular framework of the boom. Adjoining spaces in the shop accommodate the fabrication of boom steps, rotating platforms and king posts.

Size of welds on the tube joints rangfies from ⅛ to ⅝-inch, and welding procerures follow accepted practice in pipe welding. The operators are selected from those who have qualified for welding pipe in all positions.

Although the steel tubing appears to be at a disadvantage on a cost per pound basis, this is largely if not entirely offset by the design, which utilizes minimum sizes in the construction, and by the organization of the work breaking down the entire job into basic operations which are performed by specialists. The systematic program makes for ease of inspection and control at each step, effectively avoiding mistakes and rewelding. Cost figures are not available, but under the conditions it is safe to assume that the welded tubular boom is being built for no more than the overall cost of previous designs.

The structural advantage of the tubular frame is derived first of all from the fact that the round tube has the most favorable radius of gyration, it being the same in all directions. The required degree of rigidity is therefore obtained with lighter compression members and with a smaller number of bracings in a given length.

Weight reduction, compared to designs utilizing plate and rolled shapes, has been estimated at 6000 pounds on a boom capable of sustaining a static load of 45 tons. From the standpoint of operating cost alone, this is worth while weight saving on any piece of mobile equipment.

The performance in service of the crane booms built of this design has been so successful that there is no question of its continued use. This satisfactory experience justifies the foresight of the engineering staff in the development of designs based upon an exact stress analysis of the structure.

All photographs shown are approved by the United States Navy. Except where otherwise noted, the photographs were supplied through the courtesy of the New York Shipbuilding Corp. The drawings are schematic diagrams only and are not to scale.

National Acme Offers Chaser Grinding Manual

National Acme Co., East 131st street and Coit road, Cleveland, announces a "Chaser Grinding Manual" covering in very complete way the technique of sharpening and dressing chasers—both circular and radial types—used in opening die heads and collapsing taps.

This 5¼ x 7¼-inch textbook contains 32 pages of text, tables and illustrations, the study of which not only will enable operators to get better work out of their threading tools but which also will enable them to lengthen the life of chasers—a highly important consideration these days when tool steel is scarce.

The book stresses the importance of proper fixtures and proper grinding wheels in sharpening and dressing chasers with minimum loss of material and to insure angles exactly suitable to the material being cut. Tables and diagrams make it easy for operators to set up for and carry out this effective grinding. In the back of the book are tables covering the American National system of threads; formulas for computing screw thread dimensions (including pipe threads); the 3-wire system of thread measurement; and a table of cutting speeds.

This manual is offered gratis to tool engineers and operators who supply satisfactory evidence they are users of National Acme threading tools. To others, the price is 25 cents per copy but the company does not solicit such orders.

WHAT'S the JOB?

Boxed Goods

Packaged Steel

Handling Pipe

Castings

Logs or Lumber

Ashes

WHAT do you have to handle today to get things done? Is it castings, steel, boxed goods trays of small parts, scrap? Is it oddly shaped stuff like pipe, pulp wood, borings or turnings bagged goods?

Whatever it is, a Northwest Crawler Crane wil destroy the material-moving bottleneck outside you plant. No other type of material handling equipmen can do what a Northwest can do. It goes anywhere Handles magnet, clamshell, sling, hook block, log grapple, concrete bucket, pipe hooks. It piles high o low, unloads cars or trucks, and can be routed from job to job. It starts as easily as a truck and is one man operated.

If you have a material moving or store yard prob lem, it may pay you to get in touch with the North west man.

Send for this Man!

He can help you speed up your material handling. No obligation.

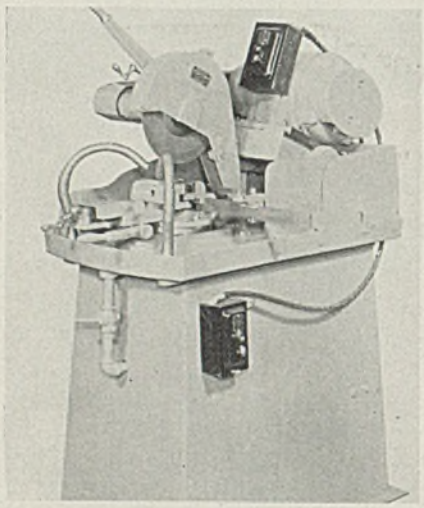
NORTHWEST ENGINEERING CO.
1805 Steger Building
28 East Jackson Blvd.
Chicago, Illinois

NORTHWEST

Industrial Equipment

Cut-Off Machine

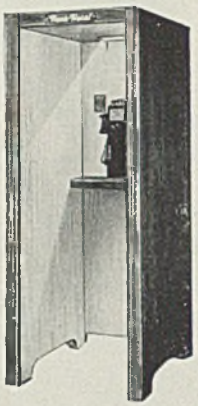
A. P. de Sanno & Son Inc., Phoenixville, Pa., announces a new Radiac type N abrasive wet cut-off machine for accurately cutting off bars, tubing and formed shapes. It is said to make such clean, smooth cuts that additional finishing is sel-



dom required. Coolant for this unit is directed to the wheel and work at the point of cutting. The machine can be supplied with two types of vises—a straight vise for straight cuts only, or a swivel vise for straight or angle cuts up to 45 degrees. The unit is capable of using stubs of larger abrasive disks from larger cut-off machines.

Factory Phone Booth

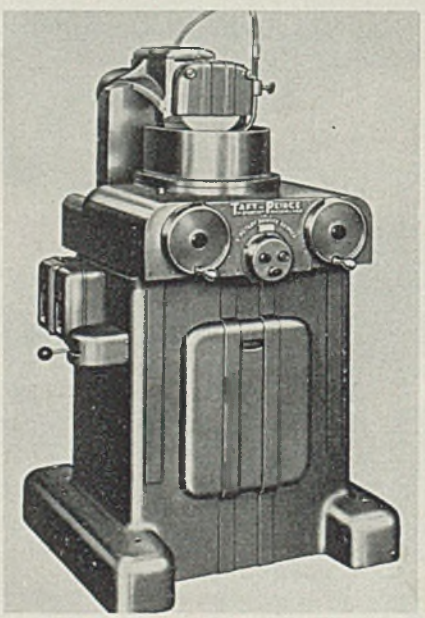
Burgess Battery Co., Acoustic Division, 2825 West Roscoe street, Chicago, announces a new model 210 wooden Acousti-Booth finished in a walnut color for use in mills, factories, power houses and other noisy industrial locations in order that telephone calls can be made without interference. The walls and ceilings in the booth are of heavy reinforced birch plywood panels, filled with a thick blanket of sound-absorbent material. The inside walls of the booth consist of a heavy perforated plywood facing which protects the sound-absorbent material. The doorless construction of the booth allows ample ventilation. It includes a shelf for the telephone instrument and for taking notes. Overhead electric light fixture with pull-chain provides illumination. Outside dimensions of the booth are



30 inches wide by 79½ inches high by 38 inches deep. The front opening is 24 inches wide.

Surface Grinder

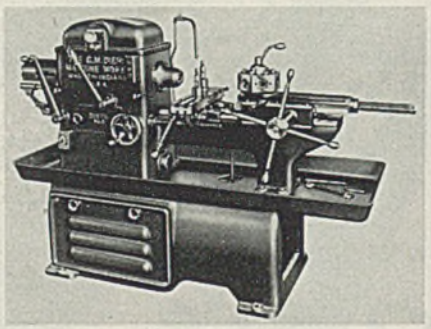
Taft-Peirce Mfg. Co., Woonsocket, R. I., announces a new 6-inch, rotary surface grinder capable of producing surfaces within extremely close limits of tolerance. It also features a tilting wheelhead which facilitates working on difficult shoulder work. The grinder uses an exclusive feature in the mounting of the wheel spindle, which swivels in a vertical plane about the center of the wheel. The spindle is carried in a cast-iron block mounted between two pairs of circular dovetail slides, permitting swiveling of the entire spindle about the wheel center through an arc from horizontal to 30 degrees below



center. The ball-bearing quill-type wheel spindle is driven directly from a 1-horsepower motor at 3600 revolutions per minute. Motor control is provided through a toggle switch mounted on the right side of the pedestal below the saddle. The work spindle is mounted on ball bearings and carried in a housing which gives suitable support and adjustment through its mounting on the machine saddle. The drive is through a worm and gear reduction from a ¼-horsepower motor mounted at the base of the spindle housing. Design of the magnetic chuck permits holding very small pieces of work at the center of the face plate. A handwheel operates the elevating mechanism. Pedestal and all supporting parts of the machine are heavily ribbed. Oil is supplied to all points requiring lubrication, except the wheel spindle and grease-sealed bearings.

Turret Lathe

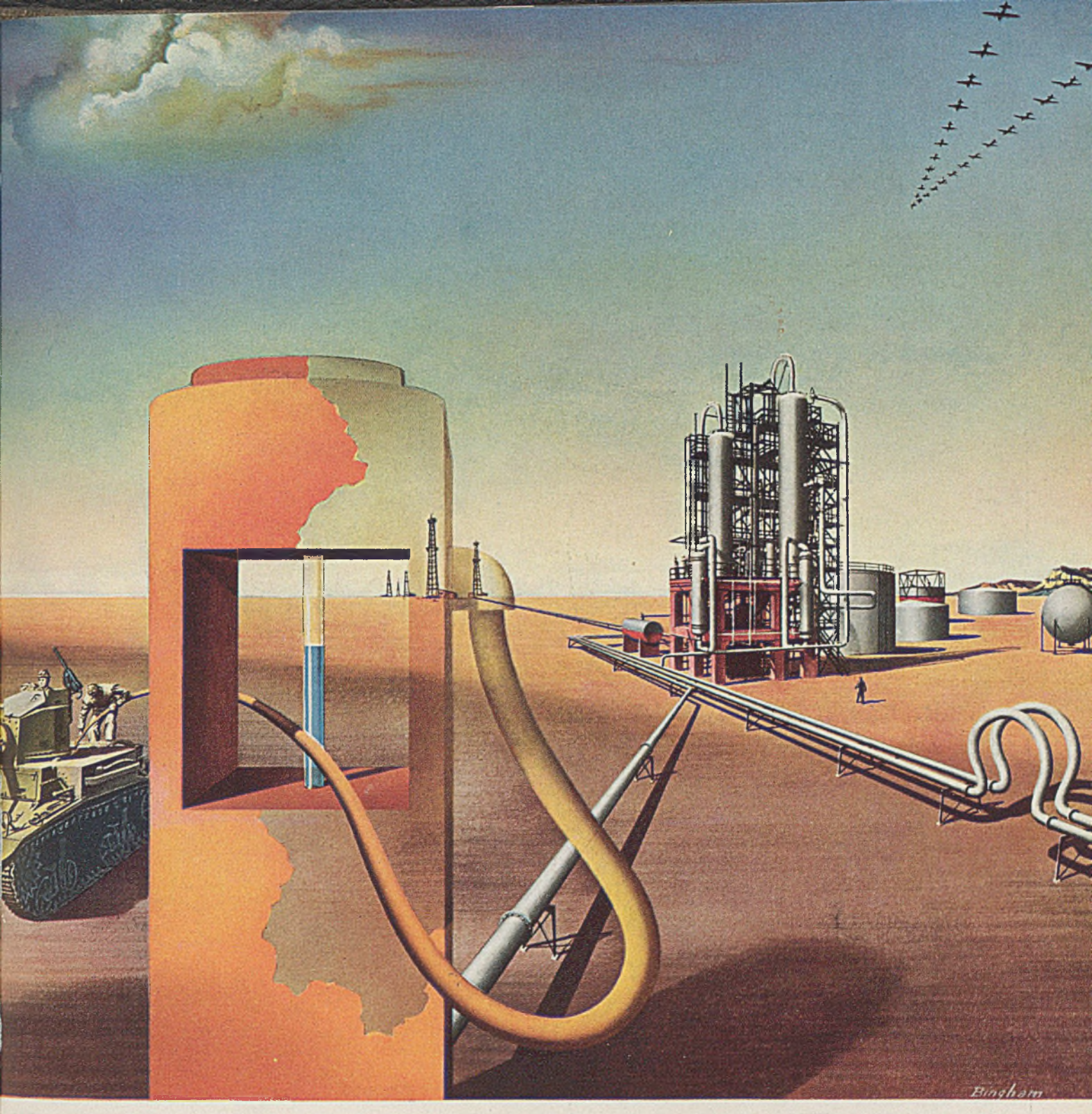
G. M. Diehl Machine Works, 107 Franklin street, Wabash, Ind., is now in production on a new type of turret lathe designed to use same tooling and collets as other standard No. 2 machines. Basically this Diehl turret lathe is a relatively simple machine to which various supplementary mechanisms can be



added if and when needed.

Thus initial cost and mechanical complexity of the machine for average jobs is held down to lowest terms without impairing its productive efficiency on these ordinary jobs and without precluding possibilities of its equally effective set-up on much more involved jobs when occasions demand. Ease, convenience and simplicity of control and operation of these machines, inherent in their design, make them especially well suited for use by operators of limited experience—including women.

Enclosed head and heavily ribbed rigid bed are cast as single unit and are mounted on a full cabinet base at the top of which is a chip pan of generous proportions. Cabinet base provides space for a large coolant tank and independently motor-driven pump, as well as for the main driving motor. Transmission is by multiple V-belts to an intermediate shaft—then by 2½-inch flat belt to the antifriction bearing spindle. A 3-horsepower constant-horsepower motor in conjunction with a lever operated 3-step belt shift with automatic idler, provide six progressive speeds forward or in reverse, which



Victory will be measured in gallons

When you hear, with bated breath, how close the enemy has come to a victory with some raid of fifty or a hundred planes, you may wonder what merciful fate kept them from using a thousand. It was more likely lack of *fuel*, not fate, that stayed them.

To reach more oil, the Axis has been flailing about Europe and Asia like a monster, sacrificing lives by the hundreds of thousands.

The American petroleum industry, with half the world's reserves, and a tremendous production of the finest gasolines and oils, is our greatest guarantee of ultimate victory.

For the petroleum industry, Koppers has built plants to remove the corrosive hydrogen sulfide and recover the sulfur in a form that can be readily converted into war-important sulfuric acid.

Koppers produces chemicals to help make gasolines anti-knock; ingredients for the manufacture of inhibitors to prevent gum formation in gasoline; chemicals for solvent refining and dewaxing for the improvement of lubricating oils; chemicals that improve the pour point and film strength of oils.

Among other products which Koppers furnishes to the petroleum industry are piston rings; Fast's self-aligning couplings; pressure treated piling, lumber and timber. In its service to the petroleum industry, Koppers feels that it is helping write the history of the war. Koppers Company, Pittsburgh, Pa.

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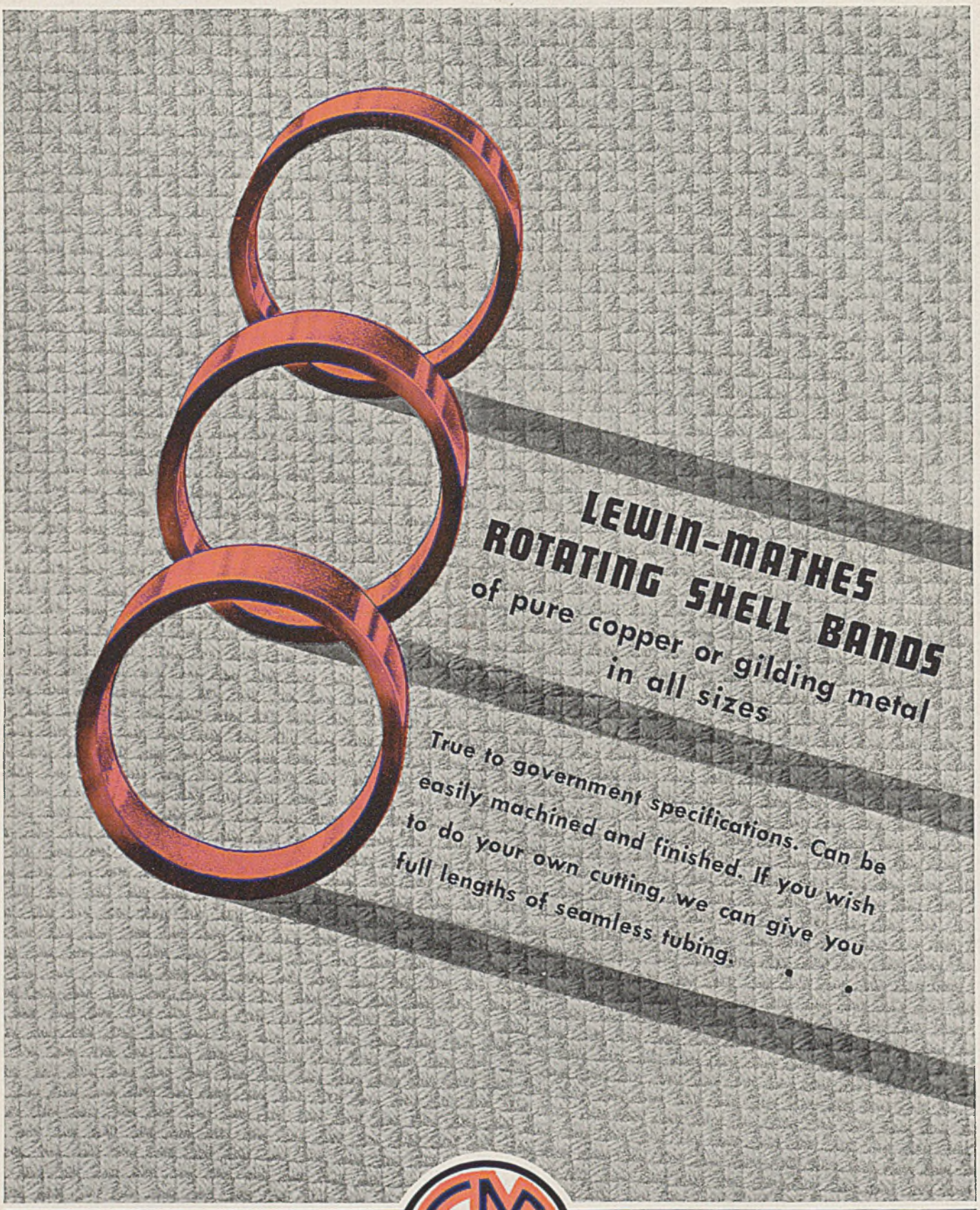

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Helpful Literature

1. Flexible Couplings

Lovejoy Flexible Coupling Co.—Illustrated bulletin describes type H, HQ, W and WQ flexible couplings. Complete engineering information is given for couplings which dampen and absorb shock, vibration, starting torque and intermittent overloads. Drawings and charts aid in selecting proper type coupling for any specific application.

2. Insulated Cable

General Electric Co.—12-page illustrated bulletin No. GEA-2623A lists general properties of No. 1799 varnished-cambric cable. Numerous illustrations show steps in manufacture of cable and picture representative types. Properties and specific uses are enumerated in detail.

3. Pumps

Geo. D. Roper Corp.—12-page illustrated bulletin describes rotary pumps which feature only two moving parts, equal size gears that operate in case with just enough clearance so that there is no perceptible wear. Design and operating features are explained and described. Eight series of pumps are pictured.

4. Cutting Oil Data

Gulf Oil Corp.—32-page illustrated bulletin No. SP 2043 gives information on properties and uses of improved cutting oils for increasing machine tool productivity. In addition, practical information is given on cutting speeds, tool settings and feeds for machining of nickel steels, stainless steels, high speed steels and wrought bronzes and aluminum.

5. Grinding Machines

Cincinnati Grinders Inc.—19-page illustrated bulletin G-491 contains complete design and construction data on 14 and 16-inch self-contained grinding machines which are recommended for finishing machine tool spindles, small mill rolls, gun mounts and the like. Numerous close-up illustrations show operating features.

6. Oil Burners

Peabody Engineering Corp.—4-page illustrated bulletin No. 108 announces improved type A and H oil burners. Individual paragraphs are devoted to descriptions of air registers, burner throat tile, atomizers and other component parts. Sketches show installation details.

7. Machine Tool

Cleveland Automatic Machine Co.—4-page illustrated bulletin deals with model A single spindle automatic. Sections treat spindle head, universal camming, tool turret, tool feed, cross slides, stock feed, independent cut-off slide, and bed and frame. Line drawings show construction features.

8. Conveyors

Standard Conveyor Co.—8-page illustrated bulletin No. 65 describes conveyors for use in ammunition plants, foundries, steel and brass mills and aviation machine shops. Illustrations shown representative installations and point out salient features.

9. Metal Cutting

Continental Machines, Inc.—48-page pocket-sized bulletin is entitled "A Chalk Talk on 40 Different Ways to Cut Machining Costs." It consists principally of sketches, each sketch being "chalk talk" explanation concerning such operations as how to stack parts for multiple cutting, how to grind and readjust saw guide inserts, use of mirrors in filing operations, speeding up template production and fixtures for sawing shells.

10. Unit Heaters

Reznor Manufacturing Co.—4-page illustrated bulletin No. 424 UB is titled "The Doors of Victory Are Opening." It tells how gas-fired unit heaters are being used in war plants and in army and navy installations. List of these installations is included.

11. Shear Type Mountings

Lord Manufacturing Co.—20-page illustrated bulletin No. 103 deals with applications of "Bonded Rubber" vertical snubbing mountings for vibration control and shock absorption in mechanical equipment. Basic engineering information is given.

12. Stampings

Whitehead Stamping Co.—16-page illustrated bulletin No. 1538-5140 shows stampings, washers and specialties produced by company. Specifications are listed for thrust washers, machinery bushings, copper burrs, tapered plugs, plain washers, Air Corps standard washers, felt retainers, tongue washers, tube connector gaskets, label holders, cable clips, and rear-view mirrors for vehicles.

13. Magnetic Clutches

Stearns Magnetic Manufacturing Co.—20-page bulletin No. 225-A, section 20, sets forth features of "High Duty" magnetic clutches and combination clutch-brakes. Given are general description, design features, information required when selecting clutch, installation details and specifications.

14. Presses

The Hydraulic Press Mfg. Co.—28-page illustrated bulletin is No. 34 of regularly-issued company publication. It contains articles describing use of "H-P-M Fastraverse" presses for producing artillery cartridge cases, for deep metal drawing of aircraft parts, and for forging high explosive shells.

15. Drills & Reamers

Whitman & Barnes—32-page illustrated bulletin, "Drill & Reamer Facts," describes and illustrates construction of twist drills and reamers, as well as general suggestions for proper use and care of these tools. Information is given on tap drill sizes and basic thread dimensions, hardness conversion table, detailed dimensions of taper shanks and wire gages.

16. Industrial Equipment

Worthington Pump & Machinery Corp.—12-page bulletin No. WP-1099-B10A is titled "How Worthington Serves Industry." It lists and pictures equipment made by company for power plant, chemical works, coal and metal mines, iron and steel mills, paper mills, marine and naval service, oil wells, railroads, textile industry, water works and sewage disposal plants.

17. Tungsten Electrodes

Vascoloy-Ramet Corp.—4-page bulletin No. W-421 explains importance of pure tungsten electrodes in atomic hydrogen welding process. Tabulated are properties of electrodes, available sizes, method of packaging and current range.

18. Care of Taps

Greenfield Tap & Die Corp.—8-page bulletin, "How To Get More Production From Taps," contains reproductions of series of advertisements appearing in trade journals on use and care of taps. It covers such subjects as tapping terminology, common sources of tapping trouble, how to lengthen life of taps and tolerances versus class of fit.

STEEL *Readers' Service Dept.*

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19. Steel Strapping

Brainard Steel Corp.—8-page illustrated bulletin discusses "Safe-Ty" strapping system for fastening cartons, crates, boxes, bales, carloads, truckloads and skidded shipments. Illustrations show representative products packaged, methods of applying steel strapping and steel bands, and types of banding and strapping available.

20. Pumps

Allis-Chalmers Manufacturing Co.—30-page illustrated bulletin B6018-B contains engineering data on "SSUnit" and "Electrifugal" pumps. Head capacity tables and dimensions aid in selecting proper pumps for individual applications. Performance data and engineering recommendations are included.

21. Industrial Ventilators

Powermatic Ventilator Co.—Illustrated bulletin, "Iron Lungs for Industry," describes "Iron Lung" ventilator which is recommended for foundries and steel mills, for buildings where welding operations are performed, and in locations where furnaces and forges are operated. Performance tables, lists of users and important features are tabulated.

22. Zinc Coated Metals

American Hot Dip Galvanizers Association, Inc.—6-page illustrated bulletin lists suggested specifications and data on hot-dip galvanizing. It also discusses subject of rust, how it can be prevented, value of zinc coatings for rustproofing, methods of applying zinc coatings, and general specifications.

23. Chromium Plating

United Chromium Inc.—14-page illustrated bulletin No. 1519-55 discusses value of chromium plating for salvaging parts and production tools, for reducing corrosion of equipment, for protecting and fortifying accuracy of gaging tools, and for increasing output of metal working tools. Representative cases are cited.

24. Tractors & Trailers

Mercury Manufacturing Co.—44-page illustrated bulletin lists important features and specifications for gasoline and electric-powered tractors, various types of trailers, and line of lift trucks. Action photographs show equipment in use in diversified industries.

25. Electrical Insulation

Owens-Corning Fiberglas Corp.—12-page illustrated bulletin No. H9.2.1 describes value of "Fiberglas" electrical insulation materials for minimizing breakdowns of electrical equipment. Electrical characteristics and properties are explained in detail with graphs, charts and tables. Available forms and types of this insulation are listed.

26. Dust Separators

Torit Manufacturing Co.—4-page illustrated bulletin No. 116-C explains features and advantages of cyclone-type dust collectors for carrying away dust-laden air from grinding, polishing and cutting wheels. Discussed are operation, application and comparison with filter bag units.

27. Metal Cleaning

Pangborn Corp.—26-page bulletin 213 discusses value of airless "Rotoblast Barrel" for economically cleaning of metal parts that are tumbled blast cleaned. Design and construction details of component parts are treated extensively and machines from sizes of 3½ to 28 cubic feet capacity are pictured.

28. Checks & Badges

Jas. H. Matthews & Co.—24-page illustrated supplement E to catalog No. 146 lists complete line of checks, badges, metal plates, tags, tokens and labels for industrial use. Numerous illustrations show representative samples of products and explanatory captions tell salient features and advantages.

29. Presses

F. J. Stokes Machine Co.—48-page illustrated bulletin No. 41-T discusses applications, economies and other advantages of manufacture, by tabletting or compressing, of powdered metals and other materials in powdered form. Various types of automatic presses are described, up to 100-ton capacities, to produce parts up to 4 inches in diameter at rates from 10 to several hundred per minute.

30. Welding Technique

Lincoln Electric Co.—18-page illustrated bulletin outlines "Fleet-Fillet" technique of arc welding which is said to permit greatly increased fillet welding. In addition to thoroughly describing technique, bulletin makes brief comparison between method and conventional procedures, and also reviews preliminary welding terms.

31. Aircraft Tubing

Summerill Tubing Co.—Two data sheets, Sec. 1, 16 a, b, c and d, are intended for insertion in company catalog on aircraft tubing data. Subjects discussed include decarburization of heat treated aircraft tubing, as well as surface defects, eccentricity and magnetic inspection of seamless tubing.

32. Dust Separator

American Air Filter Co.—16-page illustrated bulletin No. 272 describes "Roto-Clone Dynamic Precipitator," combined exhauster and dust separator. Design and construction features are explained, as well as details of installation. Tables list blower performance characteristics for various sizes.

33. Copper & Alloys

American Brass Co.—18-page bulletin No. B-31 contains information of "Anaconda Metals in the Aircraft Industry." Tables list nominal compositions, general constants and physical properties, uses, and available forms of series of copper alloys, well suited for aircraft work.

34. Colloidal Graphite

Acheson Colloids Corp.—4-page illustrated bulletin No. 130-D is one of series of technical bulletins pertaining to application of colloidal graphite to industry. Application of colloidal graphite as high temperature lubricant on oven chains, kiln cars, glass machinery, die casting machines and similar equipment are mentioned.

35. Handling Racks

Union Steel Products Co.—4-page illustrated bulletin pictures variety of types of handling racks for such diversified products as ammunition parts, bakery goods, paper rolls and textiles. Various types of hand trucks are also shown and described.

36. Cupola Air Control

Foxboro Co.—12-page illustrated bulletin No. B-268 describes Air Weight controller which insures uniform weight of air delivered to cupola, regardless of varying resistance and changes in temperature and barometer. Questions commonly asked about installations are answered in 4-page section. Lists of representative users are included.

37. Scales

Toledo Scale Co.—16-page illustrated bulletin, "Looking In On Honest Weight," takes reader on tour of plant, showing equipment and personnel used to produce variety of types of weighing devices. Scale terminology is explained, together with descriptions of principal types of scales.

38. Hard-Facing Alloys

Stoody Co.—16-page illustrated bulletin explains features of hard-facing for protecting wearing surfaces of industrial equipment. Various types of alloys are described and their applications of petroleum, steel, lumber and paper, brick and clay, agricultural, coke and gas, and dredging equipment are discussed in detail.

39. Welder Switch

Westinghouse Electric & Manufacturing Co.—6-page illustrated bulletin No. B-3025 deals with "Weld-O-Trol" power switch used in resistance welding to reduce time-outs for maintenance and to eliminate mechanical delay in contact timing. Schematic diagram shows how switch opens and closes circuit to primary of welding transformer.

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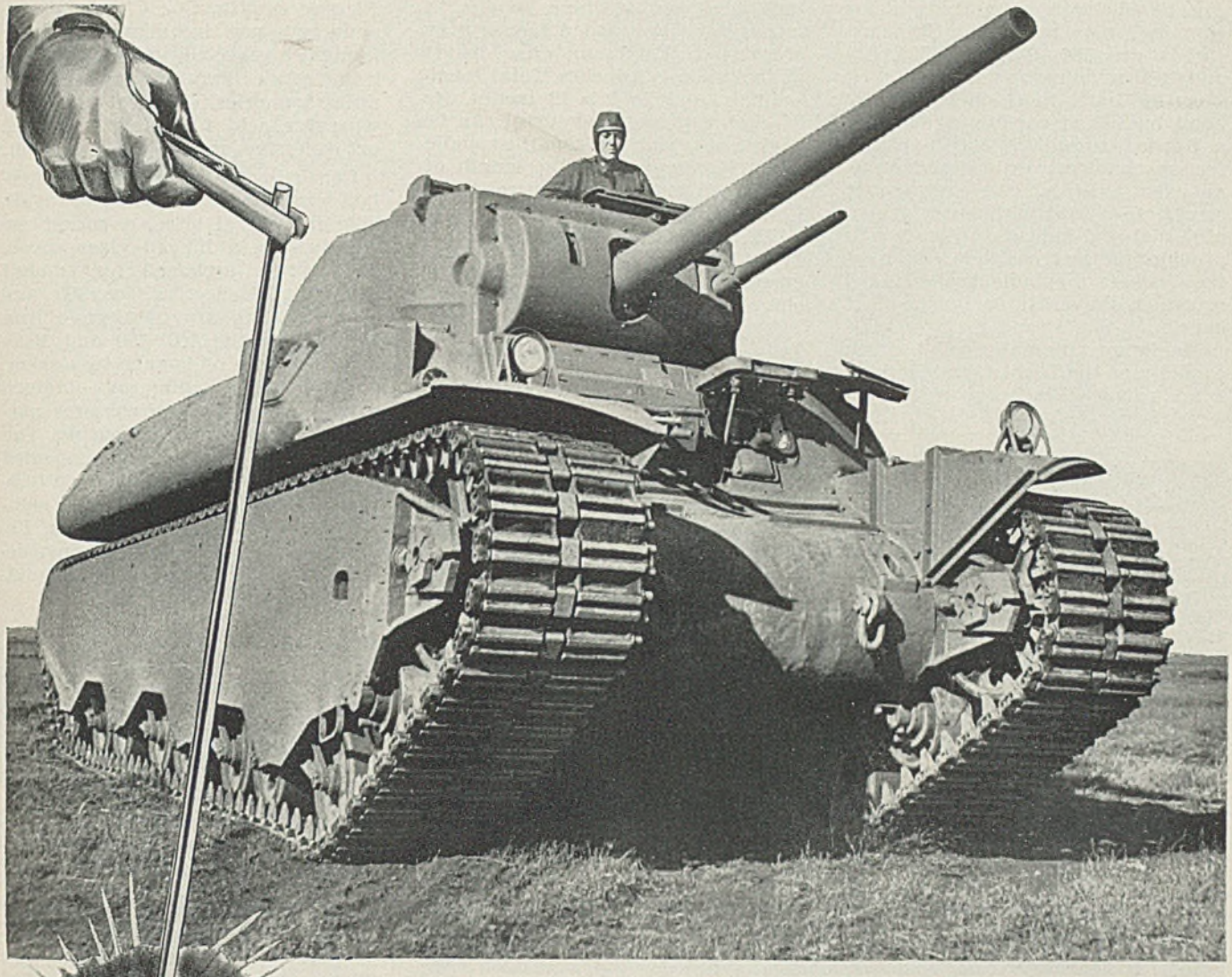

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Developed in collaboration with the leading authorities on armor plate, "AW-3" is a shielded arc electrode for fabricating cast, rolled homogeneous, and face hardened armor plate. Used also for repairing cast armor plate at room temperatures.

It's an austenitic modified 18-8 electrode with 308 base for all-position welding. Has an ultimate strength of from 85,000 to 87,000 pounds per sq. in. Available in sizes from 3/32" to 1/4". P&H engineers will gladly give you the benefit of their experience in this work. Write us for information and procedures.

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provide accurate current control with but one simple adjustment. The unique square frame design enables you to stack machines one above the other for single or parallel hook-up to meet every welding need. Write for bulletin W-28.

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can be changed instantly without stopping the machine. Standard speeds are 180, 300, 365, 500, 620 and 1000 revolutions per minute.

On the basic machine feed is by hand but when conditions demand, a 6-speed automatic cut-out power feed mechanism can be provided as an extra. Also as extra equipment screw cross feed with large graduated dial and indicator clips can be provided on the cross slide. Other extras include a spindle brake and 6 or 8-inch universal or independent chucks.

Maximum automatic collet chuck capacity of the Diehl turret lathe is 1-inch round, 11/16-inch square and 7/8-inch hexagon. Machine swings 14 inches over bed and 6 inches over cross slide. Maximum cross travel of tool slide is 5 inches. Total longitudinal hand feed is 12 inches. Its 7½-inch ram-mounted turret can be backed off 20 inches from the spindle nose. Maximum turning length of 6 inches is possible with turret tools. Power feeds of .0043, .0067, .0105, .0152, .0236 and .0367-inch per revolution are possible with extra mechanism. Net weight of this Diehl machine without extras is 2700 pounds.

Incandescent Luminaire

Lighting Division, Westinghouse Electric & Mfg. Co., Cleveland, announces a new incandescent Millite luminaire especially adapted for extreme service locations such as steel mills, foundries, chemical plants or wherever acid fumes, dust, smoke or excessive moisture is present.

Consisting of three parts, a porcelain enameled steel reflector available in several sizes, a socket assembly, and a hinged glass cover, the unit is arranged for conduit mounting. Reflectors for 300 and 500-watt sizes are of 19-gage iron sheets, and the 400, 750 and 1000-watt sizes are of 18-gage iron sheet.

Vapor-tight sealing is obtained with a heavy, treated asbestos gasket between cover and housing. The impact-resisting glass lens embodied is designed to withstand sharp temperature changes. If broken, it shatters into small dull fragments. Because of its weather-proof construction, the unit can be used for outdoor applications.

First Aid Equipment

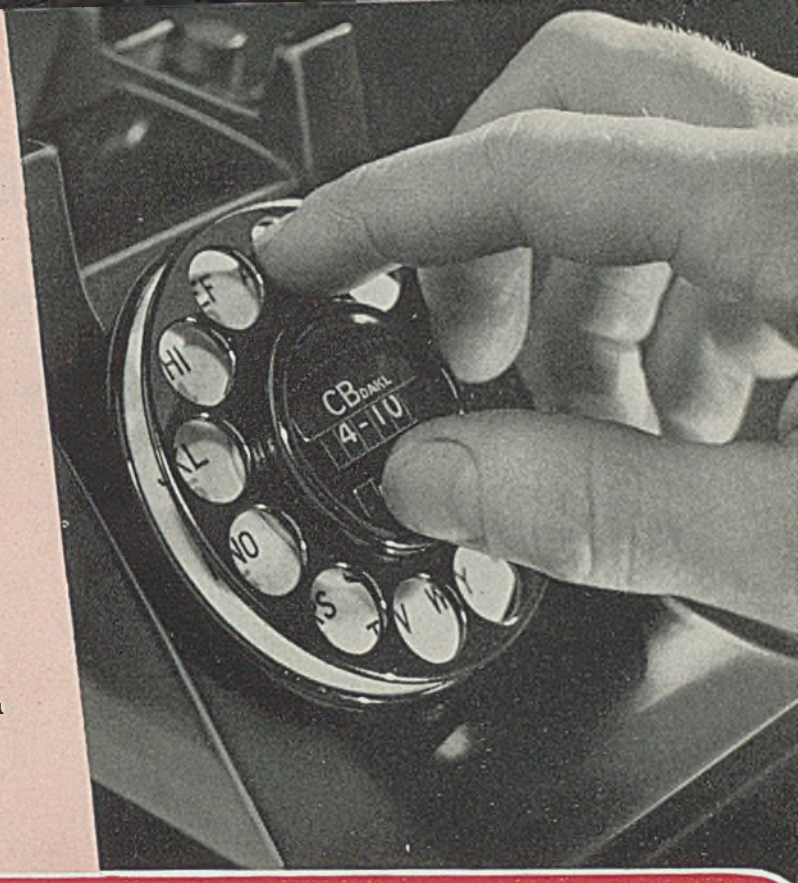
Mine Safety Appliances Co., Braddock, Thomas and Meade streets, Pittsburgh, announces two new first aid items—a folding stretcher outfit and a wood traction splint for industrial first aid centers. The folding stretcher is designed for locations where a compact unit is desired. It is quickly opened (49 inches long when folded) to full size Army type. Its frame is of dried ash, and all metal parts are of malleable iron. The cover is of 12-ounce duck. Included in the all-weather dust-proof steel case (53 inches long) besides the stretcher, are a wool and a rubber blanket, four wood splints, two chemical hot pads and a 16-unit first aid kit.

The new traction sprint is for use in supporting fractures of the arms or legs according to the accepted traction method prescribed by the American Red Cross. The splint, of hard maple with chamfered edges and shellac finish, is extensible to 66 inches, and telescopes to a compact size that is easy to pack and carry. Quickly adjustable to the patient, the splint is securely locked by bolts with wing nuts and knuried washers.

Steel Stamps

Jas. H. Matthews & Co., 3942 Forbes street, Pittsburgh, has developed new Lo-Stress steel stamps for face marking of aircraft tubular or heat treated parts. The rounded impression and special character design of the stamps provide the minimum stress set up by permanent marking. The new character is available in letter and figure stamps, hand stamps, stamping and roller dies, and in steel type for use in type holders.

Have you tried Scully?



WE are not magicians, but we will do everything within our power to help you get the materials you need. We have stocks of many steels on hand, also tools, machinery and other equipment.

Be sure to try Scully — see our phone numbers below. Cut out the number of the warehouse nearest you and paste it in a handy spot.

Structural material
Plates, various qualities
Floor Plates
Sheets: Hot Rolled, Cold Rolled, Galvanized, etc.
Bars (all shapes): Hot Rolled Carbon and Alloy grades
Hot Rolled Strip Steel
Spring Steel · Tool Steel
Drill Rod
Cold Finished Bars, Carbon and Alloy grades
Wire
COR-TEN and MAN-TEN Shapes, Sheets and Plates
Abrasion-Resisting Sheets and Plates
Eaves Trough, Conductor Pipe
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Expanded Metal
Rails
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PITTSBURGH	**CEdar 7780**
Teletype PG. 475	
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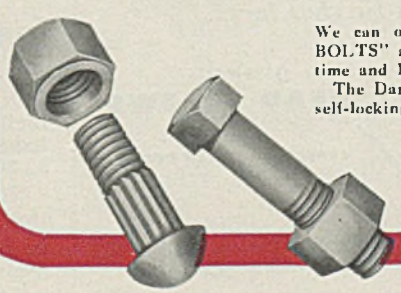
IN STOCK! DARDELET "RIVET-BOLTS"



We can offer immediate shipment of both Dardelet "RIVET-BOLTS" and Dardelet Machine Bolts. These bolts save valuable time and labor and assure permanently tight joints.

The Dardelet "RIVET-BOLT" is a ribbed bolt with Dardelet self-locking thread, and is widely used for field erection of structural steel. Has recessed nut. Bolt is driven in and nut is applied with wrench. Economical and strong.

The Machine Bolt with Dardelet self-locking thread is for general use where vibration is present.

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UNITED STATES STEEL

Campaign Ups Production

(*Concluded from Page 94*)

dled the same as any other anonymous communication.

Intended to stimulate an employe's imagination and thinking, the plan will do both when wisely operated. Surprisingly good ideas result from a large number of employes, but the plan's total effectiveness cannot be judged accurately by the quantity and quality of the suggestions received. Only a small percentage of the employes may actually be turning in suggestions, but a very much larger percentage may be trying hard to develop ideas, which indicates an attitude conducive to improvement in quality and quantity of the products.

In addition to forms previously mentioned is one used to notify employes upon receipt of their suggestions by the plan supervisor. It is delivered through the time keeping or payroll department. Another is posted semi-monthly showing who has been receiving cash awards for accepted suggestions. Stub numbers, amounts of the awards and divisions in which the suggestors are employed are also shown.

The company has an inter-exchange system whereby all adopted and paid-for suggestions or ideas can be used in any or all of the various plants of the company. From the first, as may well be assumed, management has had the full cooperation of labor, not only individually, but collectively through the CIO affiliate.

This suggestion plan has contributed much to the fine record of the "Beat the Promise" program—a record in which some departments have beaten their promises by more than 100 per cent and at least one by more than 160 per cent.

No higher praise of the work being accomplished by the program can be found than in the award to the company of the Navy "E" earlier in the year.

Guide to Erecting and Installing Machinery

Erecting and Installation Work, fabrikoid, 128 pages, 5½ x 8½ inches; published by Chemical Publishing Co. Inc., Brooklyn, N. Y., for $2.50.

This is a practical guide to erection and installation of machines and structures on site, prepared by a staff of technical experts and edited by E. Molloy. It is illustrated by 142 illustrations and drawings. Proper erection and installation on the site is necessary to obtain the benefit of precision work in present-day engineering appliances, such as engines, pumps, machine tools, electric motors and associated drives.

Speeding Production

(*Continued from Page 76*)

inspection qualifications so they will fit accurately when they reach our final assembly line.

Why does the prime contractor have all the headaches? Obviously, subcontracting multiplies the normal type of manufacturing procedure difficulties several times. While any management would prefer to have under one roof all of the manufacturing problems, the need for expanded production and the necessity of enlisting every production facility convertible, no matter how small, demand a rapid expansion of subcontracting.

Consider our own case, for instance. Our manufacturing problems are spread over 43 different plants located in different geographical areas, all of which have had to convert from their normal product to a new product and thus encounter all the difficulties which that involves. Furthermore, we have had to supply the subcontractors with materials, locate sources of supplies for castings, forgings, bar stock and other raw materials. We have to establish the proper contacts with the ordnance department and in Washington to set up inspection.

Active combat shows where ordnance items can be improved, so these design changes are occurring constantly to further complicate the manufacturing problem. Nevertheless, they must be accommodated.

Third, there are things that all of us can do. For example, all war production work involves a tremendous amount of planning and scheduling, organization and thinking before a job can be put on a machine. The average man has no conception of the mass of details and the tremendous amount of work involved. Naturally, he becomes impatient. At the same time it should be realized that the men working on these programs have tremendous demands made upon their time and energies and are thoroughly fatigued so the question of personal relationships and the ability to get along well with people is one of the important factors in facilitating war production which everyone in this picture should appreciate more fully.

Many people cannot understand the things holding back war production. From my many field contacts, not only with subcontractors but with other prime contractors in war work, I believe I am correct when I say that we must get a new attitude in our personal lives and toward the war program as a whole. In short, we must feel the HURT of war.

Too many people want to hang on to their present jobs—to their present standards of living—to their

accustomed habits. We all resist change, so when a national emergency arises, we are not prepared either in our thinking or in our mode of living or in our attitude to adapt ourselves quickly to the demands of the situation.

Furthermore, we love to criticize without giving a remedy. Certainly there is some incompetence—certainly there is some inefficiency. But when I look into the average company and see the difficulties and problems involved, I realize that we are dealing with the same people, the same petty jealousies, the same politics and the same problems of organization as in peace times. It is not unnatural that in a task as stupendous as our war program the same problems will be found.

Thus to accomplish our task we must have a greater degree of tolerance, we must back up more of our suggestions with action, we must have a greater willingness to change from normal activities to the end that we, as individuals and companies, can fit into our one common objective of winning the war.

Right here a word of caution should be sounded. Do not be misled by exceptional cases of unfairness, dishonesty or selfishness exposed in the press or on the radio. Do not make the mistake of generalizing from these individual cases that because these things happen, our whole structure is in need of radical changes. Rather, let's consider our own situation and see what we can do to correct faults over which we have control.

I hear people ask again and again, "What can I do, as an individual, to help win the war?" As far as people working in the war production industries are concerned, that is an idle question for obviously production and more production are the answer.

With the same machine tools that are at work in war plants today it is my firm belief from personal observation that we can get 20 per cent more production, once the men operating these tools feel the hurt of war.

With the same plants we have today when management converts to all-out war production by subcontracting to the greatest possible extent (90 per cent in some cases), we can step up our war output 30 per cent—when management feels the hurt of war. With our present organizations for planning the entire war program at Washington and in the various centers throughout the country, 20 per cent additional step-up can be obtained when our leadership puts aside petty jealousies and feels the hurt of war.

When Will We Feel the Hurt of War? You feel it when someone close to you is lost in the Philippines or off the coast on a ship sunk by a submarine. You feel it when reverse after reverse shocks you out of your complacency. You feel it today when you look through this issue of STEEL and read what other manufacturers are doing and must do to reach our war production goal. That's why there is a new fire of earnestness sweeping the nation. That's why we are getting down to hard work.

Certainly tremendous difficulties confront us, but *let's admit the chaos of change.* Let's admit the imperfections of individuals and organizations. Let's recognize delay and difficulties. But as individuals, as companies, as groups, as organizations, let's be prepared to do something about it. Let's change our attitude.

On the wall of my office I have framed a sign which I had painted for one specific purpose. As our company got further into this war program, it became evident that there would be dozens of reasons why certain things "could not be done." All kinds of new and unforeseen difficulties would arise. I knew that in conferences and in discussing plans invariably the word would come to me that it "could not be done." I put a frame on the wall and in it this slogan. It is well worth passing on to you:

"FIND A WAY TO DO IT"

Desulphurizing

(*Continued from Page* 88)

metal added along with the limestone charge will lower the sulphur in the iron at the spout by about 15 per cent or from 0.11 to 0.095 per cent sulphur. With high-steel mixtures, which tend to pick up more sulphur during melting, the effect is normally more pronounced; while with straight cast scrap and pig iron charges, the effect upon sulphur pickup is somewhat less. The soda ash increases the fluidity of the slag and accelerates the combustion reactions, thereby reducing oxidation of the metal charge which, as we know, is usually more pronounced with high-steel mixtures.

More recently operators have learned better how to use soda ash in the cupola; now the most generally adopted practice is to use double the regular amount of limestone on the bed coke, adding 1 pound of fused soda ash with each 10 pounds of stone, both on the bed and first two or three regular coke charges. The soda ash is reduced to 1 pound with each 20 to 40 pounds of limestone on the following charges or as required to maintain a good fluid slag throughout the heat.

This practice provides a good volume of fluid first slag for flushing off the bed coke. It prevents excessive sulphur pickup by the first iron and makes for a good start every day.

It is necessary to use fused or briquetted soda ash in the cupola, as the ordinary commercial grades would be blown away by the blast.

Desulphurizing Reagents

The alkalies available for use in commercial desulphurizing practice include, in the order of their activity: (1) Soda ash (Na_2CO_3), (2) Soda ash-Caustic mixtures, and (3) Caustic soda (NaOH). These chemicals are rated in commercial parlance on the basis of their sodium oxide (Na_2O) content. Thus caustic soda with 76 per cent Na_2O is proportionately more active than soda ash with 58 per cent Na_2O.

Under favorable conditions upward of 85 per cent of the sulphur present in cupola iron, within the range of from 0.06 to 0.13 per cent sulphur, can be removed with caustic soda in one treatment without external heat. The maximum reduction obtainable when treating similar irons with soda ash is about 75 per cent.

The limits of percentage reductions would be somewhat lower with blast furnace iron owing to the impracticability of attaining ideal conditions for maximum efficiency in practical operations at most blast furnaces—probably in

the order of 75 to 65 per cent maximum reduction, respectively.

Caustic soda, because of its higher concentration, lower melting point and greater activity as compared to soda ash, makes for more violent boiling action or more rapid contact between the metal and slag, which together account for the higher per cent sulphur reduction obtained with this reagent. Boiling of caustic slags may be prolonged in some cases by addition of soda ash and other carbonates with the caustic. With fused soda ash the boiling action is prolonged by gradual melting of the 2-pound briquettes thus effecting some increased efficiency.

Desulphurizing Reaction

Causes for the erratic or unsatisfactory results with desulphurizing sometimes reported by both blast furnaces and foundry operators usually have been due to their failure to take into account the chemical reactions and physical phenomena involved in desulphurizing with the alkalies. For instance, at cupolas variations in the quantity of slag coming out with the metal, and at blast furnaces differences in the amount of entrained silicates, and/or kish in the different casts, will among other things materially affect results.

As the alkalies instantly unite with any free slags, dirt in the ladle, or silicates in the iron, these, along with any kish coming off, both dilute the reagent and reduce the slag-metal surface contact; thereby retarding the desulphurizing reactions.

Per Cent Sulphur Reductions

By knowing the approximate sulphur contents of the iron coming from the blast furnace, and varying the desulphurizing treatment accordingly, it is thoroughly practical to reduce the sulphur in any and all irons up to 0.09 per cent sulphur and down to 0.035 per cent sulphur. This applies alike to high or low-manganese irons.

Under ordinary blast furnace practice, with proper separation of the furnace slag by the skimmer, and assuming a reasonably clean ladle, 10 pounds of granular soda ash per ton of iron properly fed on the stream during the cast normally will effect sulphur reductions in the order of: 30 per cent of an 0.03 per cent sulphur iron, 40 per cent of an 0.04 per cent sulphur iron, 50 per cent of 0.05 per cent sulphur iron, and upward of 60 per cent of an 0.09 per cent sulphur iron.

The foregoing represents the minimum per cent reductions that can be expected almost anywhere. Increased reductions would be obtained with larger additions of soda ash per ton; however, the per cent sulphur reduction per unit of reagent will fall off rapidly with increased additions.

Starting with hot clean cupola iron and with good desulphurizing practice, the per cent sulphur reduction with fused soda ash will vary about as shown in the accompanying table.

Proportionate percentage sulphur reductions can be expected with similar treatment of intermediate irons and higher or lower sulphur irons.

Efficient Desulphurizing Practice

The most important factors in efficient desulphurizing, excepting temperature, are: Clean metal free of slag or any siliceous impurities, and rapid and intimate contact between the metal and soda slag.

The stream of iron flowing into the desulphurizing ladle promotes slag metal contact due both to the physical effect of the stream in stirring the metal and to its action in whipping portions of the freshly melted or undecomposed alkali down into the metal bath. This not only increases the extent of slag metal surface contact, but makes for more effective contact because of the pressure of the over-

lying metal. Moreover, decomposition of the reagent under the metal surface with the consequent evolution of gases, causes a violent boiling action which acts to further increase surface contact.

The following procedure is recommended to insure both clean iron and maximum contact between the slag and metal:

(1) *Cupola Operations*—The tap hole should be smaller than average so as to extend the tapping time over a longer period; thus prolonging the stirring action by the stream of iron; and a small head of iron always should be held back in the cupola at the end of the tap to prevent any cupola slag coming out with the last iron. For maximum desulphurization, such as required in converter steel practice, the use of pigs or lumps of fused ash, which penetrate the slag and melt in contact with the metal gradually releasing fresh alkali, usually will give lower and more uniform sulphur.

(2) Blast Furnace Operations—The iron runner immediately in front of the furnace should be made as large as practical and the skimmer should extend well below the surface of the iron in the runner so as to completely separate the slag and iron.

The reagent, preferably granular soda ash, should be added on the stream of iron as it flows into the ladle. The rate of additions should be relatively higher at the beginning of the cast in order to provide a good volume in the ladle at the start, reducing the rate of feed thereafter to finish near the end of the tap.

Standard Covers Four Series of Screw Threads

A standard for Acme and other translating threads was recently approved by the American Standards Association, 29 West Thirty-Ninth street, New York. According to the association announcement, four series of translating screw threads are covered in the standard: General purpose Acme threads, with an angle of 29 degrees between the sides of the thread; the 29-degree stub thread; the 60-degree stub thread; and a modified square thread with a 10-degree angle between the sides of the thread.

Because of the importance of this standard in the war effort, the British Standards Institution is said to be considering its adoption. Copies of the standard are available from association headquarters at 45 cents per copy.

Publishes Engineering Essentials for Welders

In a paper covering most of the important engineering aspects of welding, H. Malcolm Priest, engineer, Railroad Research Bureau, United States Steel Corp. Subsidiaries, so simplifies the subject that it is readily usable by welding operators and by junior executives who have a limited background of technical training.

The author explains the nature of stresses in welded structures and the importance of the different physical properties of steel in relation to those stresses. From there he proceeds to an outline of the fundamentals of design for welding for different types of load.

Without attempting to give a complete coverage of metallurgy, the paper clarifies the importance of heat conductivity and of the phenomenon of expansion and contraction in sufficient detail to indicate why welding techniques should be adjusted to take advantage of the metallurgical properties of the material wherever possible.

Concluding portions of the paper deal with the nature of fatigue stresses and with modern trends in the design of welded structures. The presentation is available from the American Welding Society, 33 West Thirty-ninth street, New York, in the form of a 24-page booklet for 25 cents per copy.

Illustration at left shows Trantinyl guides in bar mill.

Below—Shoe of Trantinyl in seamless tube piercing mill.

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★

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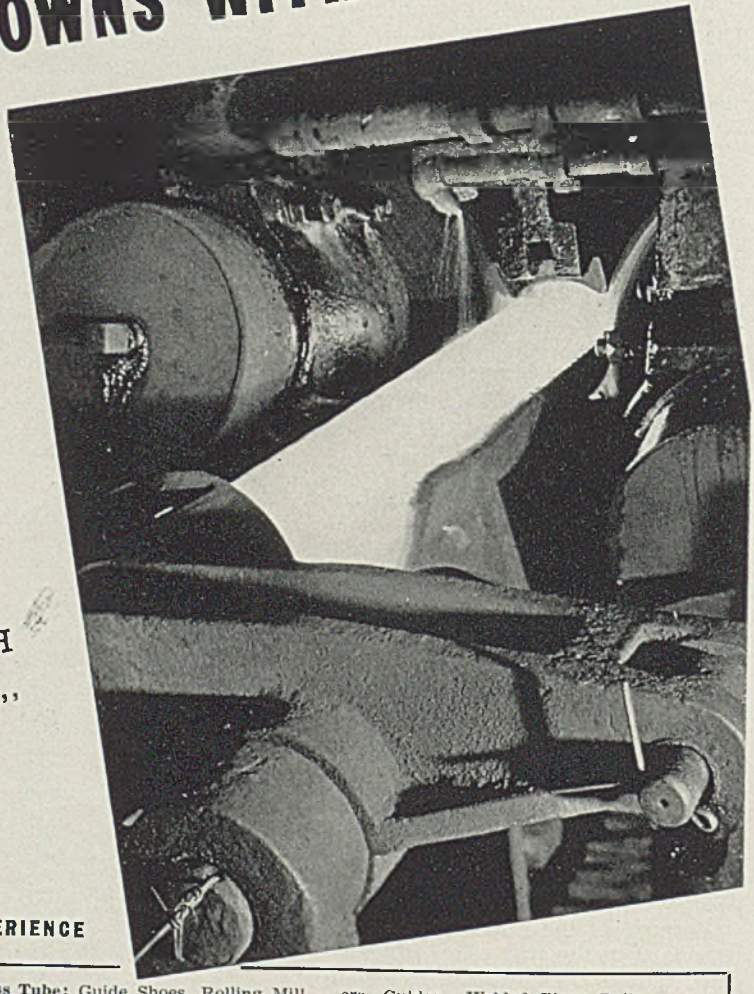

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War Need Exceeds Record Steel Output

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MARKET IN TABLOID ★

Demand
War needs increasing.

Prices
Steady at ceilings.

Production
Down ½-point to 99 per cent.

WHILE production and shipment of steel are at an unprecedented rate, new records being made constantly, demand is outrunning best efforts of the industry and war requirements are crowding out practically everything else.

Critical ratings are moving up steadily and producers who have been forced to refuse all business rated below A-1-a are receiving directives which jeopardize commitments even at this top rating. Steelmakers who have been able to promise delivery at lower priorities find the margin steadily narrowing. At the same time orders are increasing as more manufacturing plants complete conversion to war production and enter the market for steel. This trend promises to continue for some time, until changeover to essential goods is completed.

While there is variation in ability of steel producers to make delivery promises the difference is small. Plates are entirely on an allocation basis. Bars are tightening to a degree that allocation may be applied soon, few promises being made on A-1-c ratings, most makers being unable to consider anything under A-1-a, with even this contingent on later directives, which constantly interfere with rolling schedules.

In sheets a slightly wider range is possible, some producers rolling A-1-d ratings last week, while making no promises under A-1-b or A-1-c. Tonnage on books of some producers ranges down to A-1-j, with slight hope of delivery within a reasonable time. Merchant pipe output is suffering from application of priorities back to the ingot and A-1-b is necessary on most orders.

Consumers able to use bessemer steel instead of open-hearth are getting better deliveries but shift to this grade is constantly raising the level of ratings, which has tightened considerably in recent weeks.

Structural shapes are coming to the front as a factor in shipbuilding, though not as important as plates. Since plate supply has been lifted to meet requirements of shipyards, largely by product of converted continuous strip and sheet mills, shape supply has not kept pace with plate fabrication. War Production Board has ordered curtailment of other shape uses to increase supply for ships, considered of prime importance.

Necessity for open-hearth repairs in a number of districts and curtailment of pig iron supply at Pittsburgh cut into steel production last week, resulting in a drop of ½-point to 99 per cent. Loss of 2 points to 94 per cent at Pittsburgh and 1 point to 104 per cent at Chicago contributed most of the decline. Other districts going to a lower rate included Detroit, down 3 points to 93 per cent, Cleveland down 3 points to 91½ per cent, Wheeling 3½ points to 78. Eastern Pennsylvania edged up 1 point to 96 per cent, Cincinnati 7 points to 94½ and St. Louis 4½ points to 98 per cent, all a result of better scrap supply. Rates were unchanged at Buffalo, 90½; Birmingham, 95; New England, 100; Youngstown, 94.

Current scrap supply is meeting production needs, little complaint being heard of shortage. Intensive collection programs continue, with good results. Melters have an eye to the future, desiring to accumulate reserves for next winter. In most areas this meets little success, though a start has been made at Buffalo, by aid of shipments by lake and barge canal, and on the Pacific Coast receipts are above consumption. Registration of dealers under the license provision of OPA must be completed by June 20, blanks for the purpose to be distributed soon.

Maximum prices have been set by OPA on bolts, nuts, screws and rivets, effective May 28. The order is accompanied by a simplified stock list reducing from 450,000 to 250,000 the number of diameters and lengths, as a measure to conserve steel by lowering inventories.

Blast furnaces in the United States this year to May 1 consumed 26,899,347 gross tons of Lake Superior iron ore, compared with 23,741,465 tons in the period last year. Ore at furnaces and Lake Erie docks May 1 totaled 20,694,579 tons, compared with 16,937,173 tons a year earlier. Canadian figures are not available. Vessels carrying ore May 15 numbered 291, compared with 283 April 17, all fleets but one being at 100 per cent.

Composite steel and iron prices are steady at the ceiling level imposed by Office of Price Administration, finished steel at $56.73, semifinished steel at $36.00, steelmaking pig iron at $23.05 and steelmaking scrap at $19.17.

COMPOSITE MARKET AVERAGES

	May 23	May 16	May 9	One Month Ago Apr., 1942	Three Months Ago Feb., 1942	One Year Ago May, 1941	Five Years Ago May, 1937
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$62.18
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	40.00
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	23.05	22.84
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	18.50

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 melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

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

Finished Material

	May 23, 1942	Apr. 1942	Feb. 1942	May 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.49	2.47	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.22	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to 9/32-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	May 23, 1942	Apr. 1942	Feb. 1942	May 1941
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.34	25.39	25.34	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	24.06
No. 2X, del. Phila. (differ. av.)	26.215	26.265	26.215	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.54	31.54	31.34	31.09
Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.19
Ferromanganese, del. Pittsburgh	140.65	125.63	125.33	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	17.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	21.50

Coke

Connellsville, furnace, ovens	$6.25	$6.25	$6.25	$5.70
Connellsville, foundry, ovens	7.25	7.25	7.25	6.30
Chicago, by-product fdry., del.	12.25	12.25	12.25	12.25

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 and Feb. 4, 1942. 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. All seconds and off-grade products also are covered. Exceptions applying to invidividual companies are noted in the table.

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.)

Alloy Steel Ingots: Pittsburgh base, uncropped, $45.00.

Rerolling Billets, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $34.00; Detroit, del. $36.25; Duluth (bil.) $36.00.

(Wheeling Steel Corp. allocated 21,000 tons 2" square, base grade rerolling billets under lease-lend during first quarter 1942 at $37, f.o.b. Portsmouth, O.; Andrews Steel Co. may quote carbon steel slabs $41 gross ton at established basing points.)

Forging Quality Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $40.00; Detroit, del. $42.25; Duluth, $42.00.

(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points.)

Open Hearth Shell Steel: Pittsburgh, Chicago, base 1000 tons one size and section: 3-12 in., $52.00; 12-18 in., $54.00; 18 in. and over, $56.00.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54.00.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $34.00.

(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel sheet bars at $39 gross ton, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Pt., Youngstown, Coatesville, lb., $1.90.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—9/32 in., inclusive, per 100 lbs., $2.00.

Do., over 9/32—47/64 in., incl., $2.15. Worcester add $0.10 Galveston, $0.27. Pacific Coast $0.50 on water shipment.

Bars

Hot-Rolled Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, base 20 tons one size, 2.15c; Duluth, base 2.25c; Detroit, del. 2.27c; New York del. 2.51c; Phila. del. 2.49c; Gulf Ports, dock 2.52c, all-rail 2.59c Pac. ports, dock 2.50c; all rail 3.25c. (Phoenix Iron Co., Phoenixville, Pa., may quote 2.35c at established basing points.) Joslyn Mfg. Co. may quote 2.35c, Chicago base.)

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. 2.82c.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	5100 Spr. flats	0.15
2100	0.75	5100 80-1.10 Cr.	0.45
2300	1.70	6100 Bars	1.20
2500	2.55	6100 Spr. flats	0.85
3100	0.70	Carb., Van.	0.85
3200	1.35	9200 Spr. flats	0.15
3300	3.80	9200 Spr. rounds, squares	0.40
3400	3.20	T 1300, Mn, mean 1.51-2.00	0.10
4100 .15-25 Mo.	0.55	Do., carbon under 0.20 max.	0.35
46.00 .20-.30 Mo. 1.50-2.00; Ni.	1.20		

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.47c.

Turned, Ground Shafting: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c; Detroit 2.72c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.27c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, base 2.15c; Detroit, del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.25c.

(Sweet's Steel Co., Williamsport, Pa., may quote rail steel reinforcing bars 2.33c, f.o.b. mill.

Iron Bars: Single refined, Pitts. 4.40c, double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, common, 2.15c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.10c; Granite City, base 2.20c; Detroit del. 2.22c; Phila. del. 2.28c; New York del., 2.35c Pacific ports 2.65c.

(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, ... base.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.17c; New York del. 3.41c; Phila. del. 3.39c; Pacific ports, 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c; Granite City, base 3.60c; New York del. 3.74c Phila. del. 3.68c; Pacific ports 4.05c.

(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.31c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh 4.25c.

Enameling Sheets: Pittsburgh, Chicago, Gary,

Cleveland, Youngstown, Middletown, 10 gage, base 2.75c; Granite City, base 2.85c; Pacific ports 3.40c.
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c; Granite City, base 3.45c; Pacific ports 4.00c.
Electrical Sheets, No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.20c	3.95c	3.30c
Armature	3.55c	4.30c	3.65c
Electrical	4.05c	4.80c	4.15c
Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	.....
65	7.15c	7.90c	.....
58	7.65c	8.40c	.....
52	8.45c	9.20c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c; Detroit del. 2.22c; 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. 2.92c; Worcester base 3.00c.

Commodity C. R. Strip: Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; 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.
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.
Manufacturing Ternes: Pittsburgh, Chicago, Gary, 100-base box $4.30; Granite City $4.40.
Roofing Ternes: Pittsburgh base per package 112 sheets, 20 x 28 in., coating I.C., 8-lb. $12.00; 15-lb. $14.00; 20-lb. $15.00; 25-lb. $16.00; 30-lb. $17.25; 40-lb. $19.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.10c; New York, del., 2.30-2.55c; Phila., del., 2.15c; St. Louis, 2.34c; Boston, del., 2.42-67c; Pacific ports, 2.65c; Gulf Ports, 2.47c.
(Granite City Steel Co. may quote ship plates 2.25c, f.o.b. mill.)
Floor Plates: Pittsburgh, Chicago, 3.35c; Gulf ports, 3.72c; Pacific ports, 4.00c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c.
Wrought Iron Plates: Pittsburgh, 3.80c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del., 2.28c Phila., del., 2.22c; Gulf ports, 2.47c; Pacific ports, 2.75c.
(Phoenix Iron Co., Phoenixville, Pa. may quote carbon steel shapes at 2.30c at established basing points.)
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):

Bright basic, bessemer wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c

Wire Products to the Trade:

Standard and cement-coated wire nails, polished and staples, 100-lb. keg	$2.55
Annealed fence wire, 100 lb.	3.05
Galvanized fence wire, 100 lb.	3.40
Woven fence, 12½ gage and lighter, per base column	67
Do., 11 gage and heavier	70
Barbed wire, 80-rod spool, col.	70
Twisted barbless wire, col.	70
Single loop bale ties, col.	59
Fence posts, carloads, col.	69
Cut nails, Pittsburgh, carloads	$3.85

Pipe, Tubes

Welded Pipe: Base price in carloads 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

Steel In.	Blk.	Galv.	Iron In.	Blk.	Galv.
⅛	56	33	½	24	3½
¼ & ⅜	59	40½	¾	30	10
½	63½	51	1-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

Steel In.	Blk.	Galv.	Iron In.	Blk.	Galv.
2	61	49½	1¼	23	3½
2½-3	64	52½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½, 3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	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	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Lap Weld— Steel	Charcoal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2¼"	13	14.54	16.76	13.79	21.63
2¼"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.....
5"	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, $40.00.
Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, $40.00.
*Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, $28-$30.
Supplies: Angle bars, 2.70c; tie plates, 2.15c; track spikes, 3.00c; track bolts, 4.75c; do. heat treated, 5.00c.

*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.
High Speed Tool Steels:

Tung.	Chr.	Van.	Moly.	Pitts. base, per lb.
18.00	4	1	..	67.00c
18.00	4	2	1	77.00c
18.00	4	3	1	87.00c
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

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
*316	40.00	44.00	48.00	40.00	48.00
*317	50.00	54.00	58.00	50.00	58.00
†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					
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
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00
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. **Emergency basing point** is the basing point at or near the place of production or origin of shipment.
Dislocated tonnage: Producers shipping material outside their usual marketing areas because of the war emergency may charge the basing point price nearest place of production plus actual cost of transportation to destination.
Seconds or off-grade iron or steel products cannot be sold at delivered prices exceeding those applying to material of prime quality.
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. Domestic or export extras may be used in case of Lease-Lend tonnage.

Bolts, Nuts

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

Carriage and Machine

½ x 6 and smaller	65¼ off
Do., ⅝ and ⅝ x 6-in. and shorter	63¼ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	56 off
Plow bolts	65 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less	62	64
⅝-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger	56	..

Hexagon Cap Screws

Upset 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	68 off
Headless, ¼-in., larger	55 off
No. 10, smaller	60 off

Piling

Pittsburgh, Chicago, Buffalo	2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural	3.75c
⅞-inch and under	65-5 off
Wrought washers, Pittsburgh, Chicago Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l.	$2.75-3.00 off

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	$6.00
Connellsville, foundry	7.00- 7.50
Connellsville prem. fdry.	7.25- 7.60
New River, foundry	8.00- 8.25
Wise county, foundry	7.50
Wise county, furnace	6.50

By-Product Foundry

Kearny, N. J., ovens	12.15
Chicago, outside delivered	11.50
Chicago, delivered	12.25
Terre Haute, delivered	12.00
Milwaukee, ovens	12.25
New England, delivered	13.75
St. Louis, delivered	12.25
Birmingham, ovens	8.50
Indianapolis, delivered	12.00
Cincinnati, delivered	11.75
Cleveland, delivered	12.30
Buffalo, delivered	12.50
Detroit, delivered	12.25
Philadelphia, delivered	12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do. less than car lots	13.25c
Do. tank cars	11.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$29.00

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941. Exceptions indicated in footnotes. Allocation regulations from WPB Order M-17, expiring Dec. 31, 1942. Base prices bold face, delivered light face.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$25.00	$24.50	$26.00	$25.50
Newark, N. J., del.	26.62	26.12	27.62	27.12
Brooklyn, N. Y., del.	27.65	.....	.....	28.15
Birdsboro, Pa., del.	25.00	24.50	26.00	25.50
Birmingham, base	†20.38	†19.00	.....	.....
Baltimore, del.	25.67	.....	.....	.....
Boston, del.	25.12	.....	.....	.....
Chicago, del.	‡24.47	.....	.....	.....
Cincinnati, del.	24.30	22.92	.....	.....
Cleveland, del.	24.12	23.24	.....	.....
Newark, N. J., del	26.24	.....	.....	.....
Philadelphia, del.	25.51	25.01	.....	.....
St. Louis, del.	‡24.12	23.24	.....	.....
Buffalo, base	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rochester, del.	25.53	.....	26.53	26.03
Syracuse, del.	26.08	.....	27.08	26.58
Chicago, base	24.00	23.50	24.50	24.00
Milwaukee, del.	25.17	24.67	25.67	25.17
Muskegon, Mich., del.	27.38	.....	.....	27.38
Cleveland, base	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.47	24.97	25.97	25.47
Detroit, base	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.45	25.95	26.95	26.45
Duluth, base	24.50	.....	25.00	24.50
St. Paul, del.	26.76	.....	27.26	26.76
Erie, Pa., base	24.00	23.50	25.00	24.50
Everett, Mass., base	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
Granite City, Ill., base	24.00	23.50	24.50	24.00
St. Louis, del.	24.50	24.00	.....	24.50
Hamilton, O., base	24.00	23.50	.....	24.00
Cincinnati, del.	24.68	24.68	.....	25.35
Neville Island, Pa., base	24.00	23.50	24.50	24.00
‡Pittsburgh, del., No. & So. sides	24.69	24.19	25.19	24.69
Provo, Utah, base	22.00	.....	.....	.....
Sharpsville, Pa., base	24.00	23.50	24.50	24.00
Sparrows Point, Md., base	25.00	24.50	.....	.....
Baltimore, del.	26.05	.....	.....	.....
Steelton, Pa., base	.....	24.50	.....	25.50
Swedeland, Pa., base	25.00	24.50	26.00	25.50
Philadelphia, del.	25.89	25.39	.....	26.39
Toledo, O., base	24.00	23.50	24.50	24.00
Mansfield, O., del.	26.06	25.56	26.56	26.06
Youngstown, O., base	24.00	23.50	24.50	24.00

•Basic silicon grade (1.75-2.25%), add 50c for each 0.25%. †For phosphorous 0.70 and over deduct 38c. ‡Over 0.70 phos. §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.

High Silicon, Silvery

6.00-6.50 per cent (base)	$29.50		
6.51-7.00	$30.50	9.01- 9.50	$35.50
7.01-7.50	31.50	9.51-10.00	36.50
7.51-8.00	32.50	10.01-10.50	37.50
8.01-8.50	33.50	10.51-11.00	38.50
8.51-9.00	34.50	11.01-11.50	39.50

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%.

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 irons, Nos. 5 and 6.)

Charcoal Pig Iron

Northern

Lake Superior Furn.	$28.00
Chicago, del.	31.54

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.	$23.50
Valley, base	23.50

Low Phosphorus

Basing points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50 base; $30.81, delivered, Philadelphia.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: 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%).

Phosphorous Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorous content of 0.70% and over.

Manganese Differentials: Basing point prices subject to an additional charge not to exceed 50 cents a ton for each 0.50% manganese content in excess of 1.0%.

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: Pittsburgh Coke & Iron Co. (Sharpsville, Pa. furnace only) and 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, effective April 20, 1942.

Export Prices: In case of exports only, the governing basing point nearest point of production may be used, plus differentials and export transportation charges.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	$64.60
First Quality	
Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00
Ohio	43.00
Second Quality	
Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	38.00
New Jersey	49.00
Ohio	36.00
Malleable Bung Brick	
All bases	$59.85
Silica Brick	
Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30
Ladle Brick (Pa., O., W. Va., Mo.)	
Dry press	$31.00
Wire cut	29.00
Magnesite	
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Basic Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$23.00-25.00
Do., barge	23.00-25.00
No. 2 lump	23.00-25.00

(OPA May 11 established maximum at Jan. 2, 1942, level.)

Ferroalloy Prices

Ferromanganese: 78-82%, carlots, gross ton, duty paid, Atlantic ports, $135; Del. Pittsburgh $140.65; f.o.b. Southern furnaces $135; Add $6 per gross ton for packed carloads $10 for ton, $13.50 for less-ton and $18 for less than 200-lb. lots, packed.

Spiegeleisen: 19-21%, carlots per gross ton, Palmerton, Pa. $36.

Manganese Briquets: Contract basis in carloads per pound, bulk freight allowed 5.50c; packed 5.75c; ton lots 6.00c; less-ton lots 6.25c; less 200-lb. lots 6.50c. Spot prices ¼-cent higher.

Electrolytic manganese: 99.9% plus, less carlots, per lb. 42.00c.

Chromium Metal: Per lb. contained chromium in gross ton lots, contract basis, freight allowed, 98% 80.00c, 88% 79.00c. Spot prices 5 cents per lb. higher.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, f.o.b. Niagara Falls, N. Y. $2.25; less-ton lots $2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: 66-70%, per lb. contained chromium in carloads, freight allowed, 4-6% carbon 13.00c; ton lots 13.75c; less-ton lots 14.00c; less than 200-lb. lots 14.25c. 66-72%, low carbon grades:

	Car loads	Ton lots	Less ton	200 lbs.
2% C.	19.50c	20.25c	20.75c	21.00c
1% C.	20.50c	21.25c	21.75c	22.00c
0.20% C.	21.50c	22.25c	22.75c	23.00c
0.10% C.	22.50c	23.25c	23.75c	24.00c

Spot is ¼c higher.

Chromium briquets: Contract basis in carloads per lb., freight allowed 8.25c; packed 8.50c; gross ton lots 8.75c; less-ton lots 9.00c; less 200-lb. lots 9.25c. Spot prices ¼-cent higher.

Ferromolybdenum: 55-75%, per lb. contained molybdenum, f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Calcium Molybdate (Molyte): 40-45%, per lb. contained molybdenum, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, 80.00c.

Molybdic Oxide Briquets: 48-52%, per lb. contained molybdenum, f.o.b. Langeloth, Pa., any quantity 80.00c.

Molybdenum Oxide: 53-63%, per lb. contained molybdenum in 5 and 20 lb. molybdenum contained cans, f.o.b. Langeloth and Washington, Pa., any quantity 80.00c.

Molybdenum Powder: 99% per lb. in 200-lb. kegs, f.o.b. York, Pa. $2.60; 100-200 lb. lots $2.75; under 100-lb. lots $3.00.

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.

Ferrophosphorus: 23-26%, based on 24% 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 Mt. Pleasant, Tenn.; contract price $75, spot $80.

Ferrosilicon: Contract basis in gross tons per carload, bulk, freight allowed; unitage applies to each 1% silicon above or below base.

	Carloads	Ton lots
50%	$ 74.50	$ 87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

Spot prices ¼-cent higher.

Silicon Metal: Contract basis per lb., f.o.b. producers' plants, freight allowed; 1% iron; carlots 14.50c, ton lots 15.00c, less-ton lots 15.25c, less 200 lbs. 15.50c.

Silicon Metal: Contract basis per lb.; 2% iron; carlots 13.00c, ton lots 13.50c, less-ton lots 13.75c, less 200 lbs. 14.00c. Spot prices ¼-cent higher.

Silicon Briquets: Contract basis; in carloads, bulk freight allowed, per ton $74.50; packed $80.50; ton lots $84.50; less-ton lots per lb. 4.00c; less 200-lb. lots per lb. 4.25c. Spot ¼-cent per lb. higher on less-ton lots; $5 per ton higher on ton lots and over.

Silicomanganese: Contract basis freight allowed, 1½% carbon; in carloads per gross ton $128; ton lots $140.50. Spot $5 per ton higher.

Ferrotungsten: Carlots, per lb. contained tungsten, $1.90.

Tungsten Metal Powder: 98-99%, per lb. any quantity $2.55-2.65.

Ferrotitanium: 40-45%, f.o.b. Niagara Falls, N. Y., per lb. contained titanium; ton lots $1.23; less-ton lots $1.25. Spot 5 cents per lb. higher.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb. contained titanium; ton lots $1.35; less-ton lots $1.40. Spot 5 cents per lb. higher.

High-Carbon Ferrotitanium: 15-20%, Contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and North of Baltimore and St. Louis, 6-8% carbon $142.50; 3-5% carbon $157.50.

Ferrovanadium: 35-40%, contract basis, per lb. contained vanadium, f.o.b. producer's plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Vanadium Pentoxide: Technical grade, 88-92 per cent V_2O_5; contracts, any quantity, $1.10 per pound V_2O_5 contained; spot 5 cents per pound higher.

Zirconium Alloys: 12-15%, contract basis, carloads bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot $5 per ton higher.

Zirconium alloy: 35-40%, contract basis, carloads in bulk or package, per lb. of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot ¼-cent higher.

Alsifer: (Approx. 20% aluminum, 40% silicon, 40% iron) Contract basis, f.o.b. Niagara Falls, N. Y., per lb. 7.50c; ton lots 8.00c. Spot ¼-cent higher.

Simanal: (Approx. 20% each silicon, manganese, aluminum) Contract basis, freight allowed, per lb. of alloy; carlots 10.50c; ton lots

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1941

	Soft Bars	Hot-rolled Strip Bands	Hot-rolled Strip Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: S.A.E. 2300	Cold Drawn Bars: S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.68	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.56	4.05	4.65	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.04	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.42	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.92	3.45	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.38	4.23	4.98	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Chattanooga*	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	5.25	5.00	4.60	....	....
Houston, Tex.	3.75	4.30	4.30	4.05	4.05	5.50	4.00	....	5.25	....	6.90	....	....
Seattle	4.20	4.25	5.45	4.75	4.45	6.50	4.65	7.60	5.70	....	5.75	....	....
Los Angeles	4.50	4.95	6.80	4.50	4.50	6.75	4.65	6.50	5.85	....	6.10	10.55	9.55
San Francisco	3.95	4.50	6.25	4.65	4.35	6.35	4.55	6.40	6.10	....	6.80	10.80	9.80

*Not named in OPA price order.

	S.A.E. Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	....	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	8.80
San Francisco	5.45	9.80	8.80	8.65	9.05

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities, New Orleans; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-10,000 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 500-999, Los Angeles, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	£	s	d
Merchant bars, 3-inch and over	$66.50	16	10	0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20	0	0
Structural shapes	2.95c	15	10	0
Ship plates	2.90c	16	2	6
Boiler plates	3.17c	17	12	6
Sheets, black, 24 gage	4.00c	22	5	0
Sheets, galvanized, corrugated, 24 gage	4.61c	25	12	6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1	10	9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

		£	s	d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$25.79	6	8	0(a)
Basic pig iron	24.28	6	0	6(a)
Furnace coke, f.o.t. ovens	7.56	1	17	6
Billets, basic soft, 100-ton lots and over	49.37	12	5	0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14	10	6
Merchant bars, rounds and squares, under 3-inch	3.17c	17	12	0††
Shapes	2.77c	15	8	0††
Ship plates	2.91c	16	3	0††
Boiler plates	3.06c	17	0	6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22	15	0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26	2	6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23	15	0
Bands and strips, hot-rolled	3.30c	18	7	0

(a) del. Middlesbrough 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	12.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% f.o.b. Rio de Janeiro	8.00c

Tungsten Ore

Chinese wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African, 2.8:1 lump, 48%	$39.00
South African (excluding war risk)	
No ratio lump, 44%	28.00
Do. 45%	29.00
Do. 48%	34.00
Do. concentrates, 48%	33.00
Do. 50%	34.00
Brazilian (nominal)	
2.5:1 lump, 44%	31.00
2.8:1 lump, 44%	32.50
3:1 lump, 48%	41.00
No ratio lump, 48%	35.00-35.50
Do. concentrate, 48%	33.00-33.50

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	
S. African, 48%	65.00
Indian, 50%	68.00-70.00
Brazilian, 48%	
Chilean, 48%	68.00-69.00
Cuban, 51%, duty free	83.00-85.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

PRICES FOR OTHER THAN RAILROAD SCRAP

				ELECTRIC FURNACE AND FOUNDRY GRADES										
				Low Phos. Grades		Heavy Structural, Plate			Cut Auto Scrap					
	OPEN HEARTH GRADES*	Machine Shop Turnings	BLAST FURNACE GRADES*	Billet, Bloom Forge Crops	Bar Crops and smaller; Punchings, Plate	3 ft. and less	2 ft. and less	1 ft. and less	3 ft. and less	2 ft. and less	1 ft. and less	Alloy-Free Low Phos. & Sulphur Turnings	First Cut Heavy Axle & Forge Turnings	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Johnstown, Midland, Monessen, Sharon, Steubenville, Weirton, Canton, Youngstown, Warren	$20.00	$16.00	$16.00	$25.00	$22.50	$21.00	$21.50	$22.00	$20.00	$20.50	$21.00	$18.00	$19.50	$21.00
Claymont, Coatesville, Harrisburg, Conshohocken, Phoenixville	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Bethlehem	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Buffalo	19.25	15.25	15.25	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25
Cleveland, Middletown, Cincinnati, Portsmouth, Ashland	19.50	15.50	15.50	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50
Detroit	17.85	13.85	13.85	22.85	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85
Toledo	.....	13.85	13.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicago	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Kokomo	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Duluth	18.00	14.00	14.00	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00
St. Louis	17.50	13.50	13.50	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50
Birmingham, Atlanta, Alabama City, Los Angeles, San Francisco, Pittsburg, Calif.	17.00	13.00	13.00	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	12.50	12.50	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50
Seattle	14.50	10.50	10.50	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50
Portland, Oreg.	.....	.....	.....	.....	15.50	14.00	14.50	15.00	13.00	13.50	14.00	11.00	12.50	14.00

RAILROAD SCRAP

	Heavy Melting Steel	Scrap Rails	Rails for Rolling	Scrap Rails: 3 ft. and under	Scrap Rails: 2 ft. and under	Scrap Rails: 18 in. and under
Pittsburgh, Wheeling, Steubenville, Sharon, Youngstown, Canton	21.00	22.00	23.50	24.00	24.25	24.50
Philadelphia, Wilmington, Sparrows Point	19.75	20.75	22.25	22.75	23.00	23.25
Cleveland, Cincinnati, Middletown, Ashland, Portsmouth	20.50	21.50	23.00	23.50	23.75	24.00
Chicago	19.75	20.75	22.25	22.75	23.00	23.25
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Kokomo	19.25	20.25	21.75	22.25	22.50	22.75
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00
Birmingham	18.00	19.00	20.50	21.00	21.25	21.50
Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Seattle	15.50	16.50	18.00	18.50	18.75	19.00

CAST IRON SCRAP OTHER THAN RAILROAD

(Shipping point prices in gross tons)

	Group A	Group B	Group C
No. 1 Cupola Cast	$18.00	$19.00	$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & Under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	17.00	18.00	19.00
Unstripped Motor Blocks	17.50	18.50	19.50
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Miscellaneous Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C includes states not named in groups A and B, plus Kansas City, Kans.-Mo.

*Open Hearth Grades refer to No. 1 heavy melting steel, No. 1 hydraulic compressed black sheet scrap, No. 2 heavy melting steel, dealers' No. 1 bundles, dealers' No. 2 bundles and No. 1 busheling. Blast Furnace Grades refer to mixed borings and turnings, shoveling turnings, No. 2 busheling and cast iron borings. Add $5 per ton for chemical borings containing not over 0.5 per cent oil content.

A basing point includes the switching district of the city named. The Pittsburgh basing point includes the switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Pa. Cincinnati basing point includes the switching district of Newport, Ky. St. Louis basing point includes the switching districts of Granite City, East St. Louis and Madison, Ill. San Francisco basing point includes the switching districts of South San Francisco, Niles and Oakland, Calif.

Inferior Grades: Maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. No premium allowed on grades considered superior, unless approved by OPA. Addition of special preparation charges prohibited. Purchase of electric furnace or foundry grades for open hearth or blast furnace use permitted only at no more than price for corresponding open hearth grade. Exceptions: Low phos. billet, bloom and forge crops and electric furnace bundles may exceed open hearth price, and electric furnace bundles may exceed blast furnace price, if material is delivered to the consumer direct from the original industrial producer.

Commissions: No commission is payable except by a consumer to a broker for services rendered, the commission not to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; the broker does not split the commission with the seller of the scrap, with another broker or sub-broker, or with the consumer. Commissions must be shown as separate item on invoice.

Maximum Shipping Point Price: Where shipment to consumer is by rail, vessel or combination of both, scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel. In such cases, maximum shipping point prices are: (1) For shipping points located within a basing point, the price listed in the above table for scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point; and (2) for shipping points located outside a basing point, the price in the above table for scrap at the most favorable basing point, minus the lowest transportation charge by rail, water or combination thereof. When vessel movement is involved, dock charges shall be 50 cents at Memphis, $1 at Great Lakes ports, $1.25 at New England ports, 75 cents elsewhere. New England shipping point prices computed on most favorable basing point prices; maximum transportation charge on scrap from New England, $6.65 per ton.

Scrap shipped by motor vehicle is at its shipping point when loaded. For shipping points within basing points, maximum is price listed in table minus lowest switching charge. When outside basing point, maximum is price at most favorable basing point minus lowest established charge when hauled by common carrier. When hauled by seller charges are based on carload rate for rail shipment, minimum $1.00 per ton.

Maximum Delivered Prices: Determined by adding established transportation charges to shipping point price, not to exceed by more than $1 (plus freight rate increase March 18, 1942) the prices listed in the table for the nearest basing point. Certain exceptions specified in Revised Price Schedule No. 4 (Amendment 1) apply to St. Louis district consumers, to WPB allocations, to water shipments from Duluth or Superior, Wis., to shipments of billets, blooms and forge crops from Pittsburgh and to shipments of electric and foundry grades from Michigan; to shipments of turnings to ferroalloy producers and of borings to chemical users. Delivered prices of scrap shipped under WPB allocations may exceed prices at nearest basing point by more than $1; provided most economical transportation is used.

Unprepared Scrap: Above prices are for prepared scrap. Maximum prices for unprepared scrap are $2.50 less (railroad grades $3.50 less) than for the corresponding grades of prepared scrap, except for heavy breakable cast. In no case shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Graveyard autos not considered unprepared scrap.

Remote Scrap: Consists of all grades, except railroad scrap, located in Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon, Washington and Utah. Delivered price may exceed by not more than $5 the price at the basing point nearest consumer's plant, provided sworn details furnished OPA. Permission required to exceed by more than $5 the nearest basing point price. Colorado scrap is remote scrap for Colorado consumers only.

AVAILABLE FOR IMMEDIATE SHIPMENTS

COLD ROLLED STRIP STEEL—WIRE

at the Lowest Market Prices

Government restrictions and limitations resulted in certain overstocks of Cold Rolled Strip Steel in standard coils; oiled, papered, or burlapped—High Carbon Steel—Miscellaneous Wire that we are offering for immediate sale as listed below.

ALL PRICES ON THIS STEEL ARE F.O.B. CARS, OUR LOADING PLATFORM, CHICAGO, ILLINOIS

COLD ROLLED STRIP STEEL

Size	Pounds	Temper No.	Edge No.	Finish No.	
.011 x 3″	2,767	5	3	2	
.012 x 13/32″	1,716	1	3	2	
.015 x 1 7/8″	17,235	5	3	2	
.016 x 1″	700	5	3	2	Coppered
.016 x 1 7/8″	1,464	5	3	2	Coppered
.016 x 2 1/32″	1,586	5	3	2	Coppered
.016 x 3 1/8″	6,000	5	3	2	Coppered
.016 x 6 3/8″	7,724	4	3	2	Coppered
.016 x 7 13/16″	100,000	4	3	2	Coppered
.018 x 1 15/16″	1,997	4	3	2	
.016 x 4 13/16″	33,570	4 DD	3	2	Coppered
.018 x 1 3/8″	1,042	1	3	2	
.020 x 3 1/8″	5,000	1	3	3	
.025 x 1/2″	29,600	3	4 RD	2	
.025 x 1 1/2″	44,000	4 Pinch	3	2	
.025 x 2″	57,200	4	3	2	
.025 x 3 1/4″	19,000	4 Pinch	3	2	
.025 x 3 15/16″	10,000	4 Pinch	3	2	
.025 x 4″	35,377	2	3	2	
.025 x 4 3/16″	56,700	4 Pinch	3	2	
.025 x 5 1/2″	127,000	4	3	3	
.030 x 2 3/16″	60	3	3	2	
.040 x 1 5/16″	13,653	3	4 RD	3	
.030 x 2 1/4″	7,000	3	3	2	
.030 x 4 3/8″	35,000	1	3	2	
.030 x 5″	127,885	4 Pinch	3	2	
.031 x 2 5/8″	68,000	4	3	2	
.035 x 1 3/8″	80,000	3	3	2	
.035 x 3 21/32″	9,220	2	3	3	
.035 x 5 7/8″	17,000	4	3	2	
.040 x 13/16″	2,383	4	3	3	
.040 x 1 13/16″	7,000	3	3	2	
.040 x 1 15/16″	20,000	3	3	2	
.040 x 3″	78,000	3	3	2	
.050 x 2 3/16″	17,000	1 Soft	3	2	
.060 x 1″	4,307	2	3	2	
.060 x 1 7/16″	5,540	4	4 RD	3	
.060 x 1 3/4″	15,000	1	3	2	
.062 x 2 5/16″	3,499	4 Pinch	3	2	
.0625 x 3 11/16″	21,600	2	3	3	
1/16″ x 1/4″	6,502	2	4 RD	2	
.080 x 1 1/4″	7,200	2	6	3	

COLD ROLLED STRIP STEEL

Size	Pounds	Temper No.	Edge No.	Finish No.	
.088 x .710	18,600	2	4 RD	3	
.095 x 1 1/2″	14,000	2	3	2	
1/8″ x 1″	2,475	2	4 RD	2	
1/8″ x 2 1/4″	861	4	4 RD	2	
.130 x 2″	794	2	3	2	
Straightened and Cut to 9′ 2″ Long					
1 1/4″ x 3/16″	1,050	2	4 RD	3	
Straightened and Cut to 9′ 10″ Long					
1 1/4″ x 3/16″	7,780	2	4 RD	3	
.032 x 11″ x 27 3/4″	3,460	4	3	3	Boxed

HIGH CARBON STEEL

Size	Pounds	Flat Annealed	Untempered Spring Steel	Carbon	Edge
.035 x 2 1/8″	9,000	″	″	51-75	3
.040 x 1 3/16″	30,000	″	″	51-75	3
.040 x 2 7/8″	7,000	″	″	51-75	3
.050 x 1 3/4″	200,000	″	″	51-75	3
.050 x 5 1/16″	32,000	#1 Temper	#3 Finish	26-50	3

MISCELLANEOUS WIRE

Pounds	
68,000	1/2″ x .047 Half Oval Tinned Cake Pan Wire—small coils—wrapped.
1,600	.020 x 1/4″ Brightly Tinned Flat Cold Rolled Steel Wire—burlapped.
536	.037 coppered Premier Spring Wire—paper wrapped—in coils—weight coil 40 lbs.-50 lbs.
10,000	1/8″ x 1/4″ Half Round Bright Cold Rolled Strip Steel Wire—Extra Soft—#3 Temper—#3 Finish—in standard coils—burlapped, i.d. of coils 22″—weight coil 50 lbs.

BLACK BANDIRON

Pounds	
20,000	3/4″ x 1/8″ O. H. Low Carbon Hot Rolled Bands—in coils.
6,850	2 3/8″ x .0312 O. H. Low Carbon Bands—in coils.

All purchases of the above materials must be in accordance with W. P. B. orders that govern disposition of this material

This material is offered subject to all Government regulations applying to its sale. Items are offered subject to prior sale.

Write, Call or Wire Purchasing Dept., Berkshire 6000

EDWARD KATZINGER COMPANY • 1949 N. Cicero Avenue • Chicago, Illinois

Sheets, Strip

Sheet & Strip Prices, Pages 118

Sheet consumers are making further progress in conversion to war work and orders involve heavier tonnages and cover a more extended period. Trend is to higher ratings. Delivery promises for most part do not go lower than A-1-b or c. Most producers have orders on books down to A-1-j which they hope to be able to roll.

Sheets are required for many war applications, including ammunition cases, bomb components, bomb crates, mess equipment and tool boxes for the armed forces. Much goes into signal corps equipment, especially into cabinets for radios.

Much confusion persists concerning the clause in amendment No. 4 to supplementary order M-21-b, with respect to rejects. This generally is taken to mean that a jobber can place no more than 25 per cent of the primes bought in 1940 from a given producer and that rejects purchased that year can not be used to establish a quota for primes. It develops that in spite of high pressure in steel mills the proportion of rejects is much lower than normal.

While the recent amendment to PD-73, with its certificate and regrouping provisions, does not call for information on end use and date of requirements, an increasing number of producers insist on as much detail of this character as possible. They claim it is important for them to know the requirements so they can furnish the proper type of sheet without processing beyond what is necessary for the work intended.

Annealing is a bottleneck with many narrow cold-rolled strip mills, backlogs including a one-sided ratio of high carbon and alloys. Depleted inventories of hot strip for rerolling are dependent on replacements keyed to high priorities, deliveries of straight carbon rated at A-1-a being four to five weeks in most cases. Hot strip producers are limited by restricted semifinished material, due to allocations to other uses. Cold mills are unable to promise delivery on alloy strip much under four months, anticipating end use requirements for primary melting schedules about three months in advance.

Bars

Bar Prices, Page 118

Carbon bars are becoming more difficult to place with mills. Some producers are still able to promise deliveries on A-1-c ratings, but they are fewer in number. Many can consider nothing under A-1-a and this is contingent on allocations and special directives. This applies to both hot-rolled and cold-finished, more especially to the latter. The tightest situation is in sizes above 1½ inches and in small rods.

Early return to complete allocation on cold-finished bars is expected, in view of the increasing number of directives, to permit nonintegrated mills, who compose most of the industry, to obtain adequate steel. In some plants output has fallen below capacity because of slow deliveries on semifinished steel, although as a group cold finishers have the highest priority, in most cases A-1-c or better. Some AA ratings have been assigned recently and on other cases direct allocations have been made.

Distributor stocks of alloy bars are badly broken, some sizes being entirely out. Deliveries of both hot and cold-rolled carbon bars are more extended in the top ratings, with demand unabated. Forging shops are crowded with war work and are producing at capacity. High-speed tool steel stocks is active, producers of small tools promising 18 to 20 weeks on twist drills, 16 to 18 weeks on high-speed chucking reamers, 22 weeks on taper-shank twist drills and 120 days on diestock taps and threading sets.

Pipe

Pipe Prices, Page 119

Due to priorities reaching back to the ingot, high ratings are demanded on all merchant pipe made from open-hearth steel. Some mills claim they can offer definite deliveries on pipe of this character only on ratings of A-1-b or higher and others require A-1-a. Pipe of bessemer steel is easier though nothing under the A-1 ratings can be considered.

Increased use of bessemer products has tightened the situation on this steel.

Work has been started on the first of six projects in a pipeline relocation program designed to increase flow of oil to the east coast by about 200,000 barrels daily. Used pipe will be employed to a great extent. The work now under way will provide a route from East Texas and Kansas to the Atlantic coast for 25,000 barrels per day, mainly through existing systems.

Cast iron pipe sales are below normal for this season, municipal and utility buying being held in abeyance. Inquiry for Army bases and depots is active. Production is regulated by pig iron allocations, deliveries being less than requirements in cases where foundries do not have war contracts.

Wire

Wire Prices, Page 119

Wire mill backlogs have been revised by elimination of orders affected by limitation rulings, mandatory restrictions and low priority. Further ban on use of steel is expected on a larger number of products.

Heavy commitments for lend-lease have tightened supply of wire for ropemaking. Restrictions on alloy steels has forced numerous consumers to substitute carbon steel wire for many uses. Annealing and other heat treating processes are a choke point in production.

Rails, Cars

Track Material Prices, Page 119

Class I railroads had 985 locomotives on order May 1, according to the Association of American Railroads, 408 steam and 577 electric and diesel. A month earlier 930 were on order and May 1, 1941, the total was 438. During the first four months this year 237 locomotives were placed in service, 96 steam and 141 electric and diesel. The roads put 10,478 freight cars in service in April, bringing the number for the first four months to 37,741. Last year the corresponding figure was 28,284 cars.

Structural Shapes

Structural Shape Prices, Page 119

Increasing use of wood in construction has made no appreciable inroad on demand for structural steel. Considerable uncertainty has arisen from announcement by WPB that war plant construction that cannot be completed by the middle of 1943 will be cancelled. It is believed this would be followed by easing of demand for shapes, reinforcing bars and plates. Some projects have been cancelled in recent weeks, these for the most part reflecting change to wood.

Requirements for steel sheet piling have lessened sharply, due to use of timber piling. Floor plate demand shows some increase.

Curtailment of other steel products to increase structural shape output for shipbuilding has been ordered by iron and steel branch, WPB. Since strip mills have been converted to plate production supply of the latter has been increased to a point where shapes are not sufficient to match. Steel producers have been instructed to increase output of such shapes as enter into ship construction.

Pig Iron

Pig Iron Prices, Page 120

An increasing number of gray iron foundries are closing down or preparing to do so soon as a result of amendment to M-21, restricting delivery of pig iron and castings to orders with A ratings. Some closed as early as the beginning of this month when it was announced the order would be in effect May 15. This condition will have some effect on June allocations of pig iron but its effect will be more marked on the July distribution.

Washington has advised foundries unable to get priority work in gray iron to convert to steel castings, which are in strong demand, especially for the Navy. This shift has been found difficult as equipment is not easily obtained. Gray iron foundries engaged in production of machinery castings are busy,

though some have been forced to go slowly on account of lack of finishing capacity.

Some pig iron sellers believe demand for foundry iron will be reduced over the next several weeks, as a result of the foundry situation, which will increase steelmaking grades to make up for scrap shortage.

Reinforcing Bars

Reinforcing Bar Prices, Page 119

A large producer of reinforcing bars can take no new tonnage below A-1-c except by allocation. Releases against contracts for export, depot and base construction and dry dock requirements are lighter at the moment, although these requirements have far exceeded original estimates. Numerous projects not related to the war effort may be halted for the duration, including some for the Federal Works Agency. Some housing work also is expected to be stopped.

Scrap

Scrap Prices, Page 122

Supply of industrial scrap from processing of the unprecedented tonnage of finished steel now being produced is not keeping pace, fabrication of war goods apparently not yielding as much scrap as normal civilian use. Shortage of labor for preparing scrap in yards is causing delay in some instances. Floodlights have been installed in many preparation yards where sufficient labor is available for a second shift.

Buffalo interests estimate scrap movement this year at 35 per cent above the same period in 1941. Drive for material is being continued in an effort to build reserves for winter, 200,000 tons being considered necessary for maximum consumption through cold weather. Boat shipments from the head of the lakes and through the barge canal have allowed a start on accumulating reserves.

Flow of scrap into the St. Louis area has receded somewhat from the level of preceding weeks, due partially to heavy rains, limiting collections in rural districts.

In the Pacific Northwest scrap is being delivered in volume to support peak consumption and also to allow some stock piling.

Small quantities of relaying rail and rerolling scrap rail, under ten tons per month, may be sold without authorization under an amendment to L-88, by WPB, which has found it desirable to permit deliveries of small quantities of scrap rail. The original order had practically halted shipments of this material.

OPA forms are being printed for registration of dealers selling scrap, salvage material and waste to consumers, in case of iron and steel scrap to consumers or their brokers. All dealers must be licensed by June 20 in order to continue business.

Modification of regulations on mixed carloads has eased the situation of smaller dealers, allowing shipments to be made earlier, without waiting for full carloads of a grade.

Institute of Scrap Iron and Steel Inc. has protested order No. 5 of the Office of Defense Transportation, providing that trucking of scrap from 15 miles outside a city must include a full load outward and a 75 per cent load back. A committee of steel mill representatives and scrap brokers last week conferred with OPA on various problems, such as reconsignment of rejected cars, as in the case of suits against Jones & Laughlin Steel Corp.

Iron Ore

Iron Ore Prices, Page 121

April consumption of Lake Superior iron ore totaled 6,806,529 gross tons, compared with 6,899,667 tons in March and 5,679,992 tons in April, 1941, this applying to furnaces in the United States, figures not being available for Canadian furnaces, according to the Lake Superior Iron Ore Association, Cleveland.

Ore on hand at docks and furnaces May 1, Canadian figures also lacking, totaled 20,694,579 tons, compared with 19,550,606 tons a month earlier and 16,937,173 tons a year ago. Number of furnaces in blast May 1 in the United States was 174 and in Canada 7, compared with revised figures of 175

in the United States and 7 in Canada, a month ago. A year ago 150 were blowing in the United States and 6 in Canada. Seven stacks were idle in the United States and 1 in Canada May 1.

Cumulative ore consumption to May 1, this year, was 26,899,347 tons, compared with 23,741,465 tons for the comparable period in 1941, United States figures only.

American Great Lakes vessels in the iron ore trade May 15 numbered 291, with trip capacity of 2,691,440 gross tons, compared with 283 ships rated at 2,643,240 tons April 15, as compiled by C. C. Lindeman, statistician for the M. A. Hanna Co. All the 23 ore-carrying fleets were 100 per cent active except the Nicholson Universal Steamship Co., which has two vessels still in the pulpwood trade and five being converted to ore carriers. A ship of the Cargo Carriers Inc. entered the ore trade May 16 and is not included in the May 15 report.

A bill has been introduced in the Senate authorizing vessels of Canadian registry to transport iron ore between United States ports on the Great Lakes "during continuance of the present war or until such earlier time as Congress by concurrent resolution or the President by proclamation may designate". Last year similar authorization was voted for one year.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 119

Maximum manufacturers' prices on bolts, nuts, screws and rivets were announced last week by OPA. Prices, with the exception of cap and set screws, are stabilized at levels prevailing Oct. 1, 1941. Prices of cap and set screws are stabilized at the levels of June 1, 1941. Maximum prices are set forth in regulation No. 147, on ferrous and nonferrous bolts, nuts, screws and rivets, and become effective May 28.

In conjunction with the regulation OPA issued a simplified stock list of standard sizes of bolts, nuts and other fastenings, reducing the number of stock sizes from approximately 450,000 to 250,000.

Delivery charges and allowances provided for in the new price regulation are, with one exception, those historically developed and adopted by the industry in its basing point system which came into being about 1910. The exception is a provision allowing a charge for all-rail freight to the Pacific Coast as far as the cost exceeds the amount of freight, which, in general, would normally have ben absorbed by the producer if shipped by rail and water.

Industrial fastenings made from aluminum, as well as nails, tacks and washers made of any metal, are specifically excluded from the regulation.

Bolt and nut production is limited only by quantity of bar and rod steel they are able to get from mills, and most are unable to operate more than 48 hours per week at best. This situation may be changed by expanding volume of high-rated tonnage for building construction. Considerable tonnage of bolts, nuts and rivets is coming up for export to England under lend-lease, with high priority.

Pacific Coast

San Francisco—Demand for plates and shapes predominate and some heavy tonnages are being placed. Among outstanding awards were 42 Liberty ships for the United States Maritime Commission, placed with the Oregon Shipbuilding Co., Portland, Oreg., nad 38 with Permanente Shipbuilding Corp., Richmond, Calif. The Alameda, Calif., yard of Bethlehem Shipbuilding Co. has been awarded ten transports.

Utah Construction Co. is low bidder at $18,996,392 for the Davis Dam and power house, Davis Dam Project, Arizona-Nevada, involving 7000 tons of reinforcing bars, 741 tons of shapes for crane installations, 425 tons for roofing, crane runway beams and power house, 195 tons for stoplog guides, 570 tons for trash racks, 187 tons for gate hoists and penstock gates, 277 tons for hoists and spillway gates, 135 tons for bulkhead gates and 1122 tons for fixed wheel gates.

All reinforcing bar mills are booked months in advance and little material is finding its way into the hands of private interests.

Seattle—Reports are current that Defense Plant Corp. plans to es-

tablish a steel rolling mill near Spokane, Wash., but no official announcement has been made. Washington state has surveyed potential iron ore deposits and reports approximately 4,500,000 tons in Kittitas, Okanogan, Stevens, Ferry and Chelan counties, adjacent to Spokane, with less than 1,000,000 tons definitely are located in western Washington.

Cast iron pipe inquiries are mainly for defense housing and other public projects taking the highest priority ratings. Bids are in at Seattle for two district improvements, and while figures were received on cast iron pipe, awards are expected to be for transite.

Scrap continues to arrive from the country in satisfactory volume, mills being able to increase inventories in spite of record consumption. The salvage campaign is producing increased receipts at tidewater.

OPA Cancels Special Price for Two Sellers

Office of Price Administration has ordered two steel companies to reduce prices previously allowed them above the maximum because of higher costs, as conditions are said to have changed. Central Iron & Steel Co., Harrisburg, Pa., previously allowed a maximum of $2.35 per 100 pounds on steel plates, has been ordered to restore the price to $2.10, provided by schedule 6. Eckles Nye Steel Co., Syracuse, N. Y., previously allowed to charge $2.50, has been ordered to reduce price to $2.40 for rail merchant bars, which is still higher than the maximum of $2.15 provided in schedule 6. Both orders are effective May 23.

Steel in Europe

Foreign Steel Prices, Page 121

London—(*By Cable*)—Demand for small structurals is increasing in Great Britain but pressure for heavy material is lessening. Expanding shipbuilding needs bring increased call for heavy plates. Steady demand is met for steel for colliery and railroad maintenance.

Canada

Toronto, Ont.—The Canadian government is beginning to take drastic action to provide metals necessary for war industry. While many restrictions have been placed on use of steel and other metals by non-war consumers, all loopholes now are being closed to provide materials urgently needed for the war.

The Department of Munitions and Supply has announced that effective immediately all orders for sheets, plates, structural shapes, bars and some other materials, must be approved by the steel controller. Pig iron has been under these restrictions for many months, and producers have been confining deliveries to top rating war contractors on most of the other lines.

Structural steel demand has increased, due to further expansion of war industry and power developments. Awards for the week were down to about 8000 tons, but there are indications of sharp expansion in the next two or three weeks as a result of several construction jobs pending.

With prectically all civilian production suspended, merchant pig iron sales have been holding at about 8000 tons weekly, which absorbs practically all output of foundry and malleable grades. The market could absorb almost double this tonnage, but under strict control only essential war melters are being supplied.

Illinois Freight Rates Raised 3 to 6 Per Cent

Illinois Commerce Commission last week granted railroads intrastate rate increases of 3 and 6 per cent on certain commodities, ending a controversy which developed when it refused to accede to higher rates in Illinois. They are on a par with those granted March 2 by Interstate Commerce Commission. Included among lower rated commodities are limestone and coal shipped to East St. Louis and Alton districts on which the rate will be 3 instead of 5 cents a ton, as on other coal movements.

Nonferrous Metal Prices

May	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-22	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.50	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.75
Zinc, 100 lb. base	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices
(In cents per pound, carlots)

Copper

No. 1 heavy	9.50-10.00
Light	7.50- 8.00

Brass

No. 1 composition	9.00- 9.50
Light	6.00- 6.50
Heavy yellow	6.50- 7.00
Auto radiators	7.25- 7.75
Composition turnings	7.75- 8.25

Zinc

Old	5.25- 5.75
New clippings	6.75- 7.25

Aluminum

Clippings	10.50-11.00
Cast	10.00-10.50
Pistons	10.00-10.50
Sheet	10.00-10.50

Lead

Heavy	5.12½-5.62½
Mixed babbitt	6.00- 7.00
Electrotype shells	5.00- 5.75
Stereotype, Linotype	6.50- 7.50

Tin and Alloys

Block tin pipe	45.00-47.00
No. 1 pewter	37.00-39.00
Solder joints	9.50-10.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	13.25
Standard No. 12 aluminum	14.50

Nonferrous Metals

New York—Failure to keep posted daily on WPB and OPA regulations will be costly, since violators will be faced with suspension orders or with official rebukes. Several firms in the nonferrous metal field were penalized during the past week.

Copper—Every consumer who has not done so should secure immediately a copy of the "End Use Code" from WPB since it must be used soon to guide users in requesting allocations of copper, brass and bronze ingots, scrap, etc.

Lead—Between private producers and the Metals Reserve Co. a stockpile of more than 100,000 tons of lead has been accumulated in this country. April production rose 2 per cent over March and 20 per cent over January.

Zinc—The State Department's proposal to reduce the import duty on zinc is meeting stiff opposition from the industry. It is pointed out that a further reduction would force the United States to shift its peace and war dependence upon other countries for part of our ore supply.

Semifinished Steel

Semifinished Prices, Page 118

An increasing number of finishing mills are hampered by supply of semifinished steel, in spite of the fact that ingot output is steady at a maximum rate. With priority applying as far back as the ingot, raw and semifinished steel are diverted to most needed finished products, leaving insufficient supply to meet all demands for less favored products. Some steelmakers believe it will be necessary to obtain allocations of semifinished from mills whose needs are not as pressing.

NEW BUSINESS

Plant Expansion, Construction and Enterprise, Government Inquiries, Sub-Contract Opportunities, Contracts Placed and Pending

SUB-CONTRACT OPPORTUNITIES . . .

Data on subcontract work are issued by local offices of the Contract Distribution Branch, WPB. Contact either the office issuing the data or your nearest district office. Data on prime contracts also are issued by Contract Distribution offices, which usually have drawings and specifications, but bids should be submitted directly to contracting officers as indicated.

Chicago office, Contract Distribution Branch of WPB, 20 North Wacker Drive, is seeking contractors for the following:

O-119-K-R: Materials furnished by prime contractor, aluminum airplane parts requiring machine work only, limits close, machines required Nos. 3, 4 and 5 horizontal milling machines. Contact Indianapolis office, Circle Tower building.

I-557-MCH-R: Indiana prime contractor needs subcontractor to manufacture cast steel castings, from one to six pounds each. Contact Indianapolis office, Circle Tower building.

M-120-CH-R: Subcontractors wanted to figure on assembly or component parts individually. Manufacture drop forgings 3½ x 4½-inch steel. Reduce on one end for seamless steel tubing. Weld tubing to forgings. Machine forgings. Contact Indianapolis office, Circle Tower building.

VBM-D1-R: Iowa concern urgently seeking available time on Fellows gear shapers, for spline work. Tolerance .001. Material furnished. Contact Des Moines, Iowa, office, 708 Crocker building.

7-A-505-R: Jigs and fixtures of several kinds needed at once. Designs may be seen at office of prime contractor in Chicago. Tool and die shops should advise how much open time there is for this work. Time of delivery is paramount. Priority A-1-a.

8-A-505: Automatic screw machine capacity required at once for making fuze parts. Production will be at rate of approximately 200,000 per month and at present 2,000,000 to 3,000,000 total production will be required for each of four parts. Brown & Sharpe No. 0, 00 and 2 preferred. Both 0 and 00 should have slotting attachment. Material to be furnished by subcontractor. A-1-a priority. Drawings at Chicago office.

9-F-N-205-R: Navy requires 10 small parts. Samples and drawings at this office. Total number approximately 52,000 pieces. Requires multi-spindle automatic, cylindrical grinders and milling machines. Also, 15 items are needed. Require spur and bevel gear cutting, Potter & Johnson or Fay automatic broaching and milling machines and auxiliary tooling equipment. Blueprints at permanent Chicago exhibit.

15-N-508: Louisiana firm requires rudder stock fittings, mild steel castings, completely machined. Planers and millers required. Blueprints at Chicago office.

18-A-315-R: Large prime contractor has six automatic screw machine items to sublet. Quantities vary from 5000 to 50,000 pieces each. Machine required, 2⅝-inch six-spindle Gridley or four-spindle Acme. Machining time in minutes given for each item, also price agreeable to prime contractor. Subcontractor to furnish material. Blueprints at this office.

24-F-A-217-R: Prime subcontractor on tanks has subcontract work to let for 7-foot or larger vertical boring mills, large Keller machines or horizontal boring mills with 5-inch bar. Parts involved weigh approximately three tons each. Urgent and carries top priority which supersedes much work at present on this type equipment.

29-A-514: Urgent and immediate requirement for thread grinding facilities has come to this office, 2000 pieces for component parts of tools for fuze production, several sizes ranging from ⅝ to 1¼-inch in diameter, 24-thread, maximum length ½-inch, hardened alloy steel. A-1-a priority. Report available machine hours on any unit of this style to this office at once. Can also use external grinding facilities. Full information from prime contractor.

Minneapolis office, Contract Distribution Branch of WPB, 326 Midland Bank building, is seeking contractors for the following:

S.O. No. 194: Local contractor desires to subcontract relatively simple work on 18 parts. Operations consist of milling, boring, reaming, turning, drilling, threading, welding and curling. Materials, tools, dies, jigs and fixtures furnished. Quantities, 25 to 200. Pieces not difficult but being sublet to relieve congestion in prime contractor's shop. Drawings at Minneapolis office.

S.O. No. 196: Local contractor desires subcontract quotation on machine work on three small iron castings. Will require a turret lathe. Quantities, 5000 to 10,000, with daily delivery of 100 of one casting and 50 each of the other two. Tolerance .001 and .002. Contractor will furnish castings and pay freight both ways. Drawings available.

S.O. No. 197: Numerous automatic screw machine parts from ⅛ to 2½ inches in quantities from 200 to 7200. Material furnished and early delivery required.

S.O. No. 198: Quotations wanted on small drop forging in quantities of 1000 to 20,000. First delivery required early in June. Drawing available.

S.O. No. 204: Midwest engine builder wants diesel cylinder heads machined. Operations include milling, drilling, reaming, boring and grinding of valve seats. Iron castings furnished, 1000 for one model, 600 of another. First delivery of 200 July 1. Drawings and route sheets at this office.

S.O. No. 205: Local navy contractor urgently needs Gleason bevel gear cutting and testing capacity (No. 6 and No. 12 cutters) about 500 altogether needed. Lots run to about 200 per size and sizes run from 2½ to 9 inches diameter. Blanks and arbors will be furnished.

New York office, Contract Distribution Branch of WPB, 122 East Forty-Second street, New York, reports the following subcontract opportunities:

S-127: Chicago firm seeks subcontractors for turning, threading, milling and recessing 100,000 bodies for No. 48 fuzes; to be made of steel, WDx 1314, free-turning, cadmium plated. Length is 1.935-inch, diameter 2.298-inch; threaded outside 1.7-14 NS1. Tolerance .005. Machines needed, multiple spindle automatic screw machines and cadmium plating facilities. Quotations asked with or without materials furnished. Blueprints at New York office.

S-128: New Jersey toolmaking firm seeks subcontractors with facilities for making steel dies of various dimensions to commercial tolerances. Materials will be furnished by prime contractor. Blueprints available at Newark, N. J., contract distribution office, 20 Washington place.

S-129: New York City firm wishes to locate subcontractors who have casting facilities for production of brass die castings.

S-130: New Jersey instrument manufacturer needs subcontractors with automatic screw machine facilities to produce parts. Close tolerances required. Machines needed Brown & Sharpe 00, 0, 1, 2 or equivalent. Blueprints for inspection at Newark, N. J., office, 20 Washington Place.

Boston office, Contract Distribution Branch of WPB, 17 Court street, is seeking contractors for the following:

SC-41: Prime contractor requires facilities of 12 hand milling machines, either bench or pedestal type.

SC-42: Facilities required for lifting eye, steel forging, Gr M. (46-S-1), 6.5 pounds each. Is oval shaped ring standing on a base, inside diameter of eye 1½-inch radius, 1¼-inch diameter of material. Base 4 inches in diameter, ¾-inch thick. Drawings supplied to prospective subcontractors. Quantity is 2000 per month, total order at present 20,000 pieces. Delivery to start the early part of June. A 3000-pound hammer is required.

SC-43: Subcontractor wanted for slitting up to ¼-inch width or to furnish ¼-inch cellulose acetate butyrate tape.

SC-44: Connecticut manufacturer requires steel screw machine facilities to process 11,000 pieces of 1-inch round No. 1045. Tolerance plus or minus .005.

SC-45: Connecticut manufacturer is seeking services of subcontractor for boring large machine bases. Materials, gray iron castings weighingg 1000 to 1800 pounds; will be supplied by prime contractor. Total quantity will be 75 pieces at rate of 3 to 6 per week. Tolerance .0002. Priority A-1-a. Machines required: Horizontal boring mill, 5-

inch bar, 48 x 84-inch table, and plane capable of servicing mill.

Milwaukee office, Contract Distribution Branch of WPB, 161 West Wisconsin avenue, Milwaukee, Wis., is seeking contractors for the following:

WP-276: Prime seeks good source for quality gage work, plug, ring or indicator type. Immediate action requested to Milwaukee WPB office, bulletin section.

WP277X. Prime will furnish material and cadmium plating for magazine to be produced at 125,000 per month to complete quantity of 3,000,000. Subcontractor to machine complete except grinding and burring small hole. On exhibit at Milwaukee office.

WP278X: Three million firing pins must be machined at rate of 125,000 per month, part or whole. Prime will furnish material.

STRUCTURAL SHAPES .

SHAPE CONTRACTS PLACED

1700 tons, blast furnace power house, Indiana Harbor, Ind. for Defense Plant Corp., for operation by Inland Steel Co., to Joseph T. Ryerson & Son Co., Chicago; Arthur G. McKee & Co., Cleveland, contractor.

1180 tons, staging supports, Seattle, divided between Pacific Car & Foundry Co. and Isaacson Iron Works, Seattle.

500 tons, three 125-foot truss spans, Topeka, Kans., for Union Pacific railroad, to American Bridge Co., Pittsburgh.

420 tons, machine shop, Bethlehem Shipbuilding Corp., Alameda, Calif., to Bethlehem Steel Co., San Francisco.

380 tons, floor-plate fabrication for Dravo Corp. shipyards, Wilmington, Del., to Belmont Iron Works, Philadelphia, through W. F. Trimble & Sons, Pittsburgh.

317 tons, outfitting shop, Bethlehem Shipbuilding Corp., Alameda, Calif., to Bethlehem Steel Co., San Francisco.

250 tons, two turntables for Union Pacific railroad, to R. W. Young Co., Milwaukee.

135 tons, three towers, for government, to Aetna Iron & Steel Co., Jacksonville, Fla.; M. E. Souther, Minneapolis, contractor.

100 tons or more, two 250-ton bridge cranes, ordnance plant, Idaho, to Alliance Machine Co., Alliance, O., $601,510, Bureau of Yards and Docks; other crane awards; two dry dock cranes, navy yard, to Star Iron & Steel Co., Tacoma, Wash., $454,000; four jib cranes for piers and one 25-ton dry dock crane, to Anthony M. Meyerstein Inc., engineer, Brooklyn, total $941,400.

SHAPE CONTRACTS PENDING

7000 tons, in lots of 4000 and 3000 tons, plant expansion, Lukens Steel Co., Coatesville, Pa.

SHAPE AWARDS COMPARED

	Tons
Week ended May 23	4,982
Week ended May 16	28,560
Week ended May 9	22,801
This week, 1941	40,611
Weekly average, 1942	31,116
Weekly average, 1941	27,373
Weekly average, April, 1942	64,510
Total to date, 1941	663,210
Total to date, 1942	617,342

Includes awards of 100 tons or more.

6000 tons, factory, Curtiss-Wright Corp., Louisville, Ky., bids rejected.

Unstated, terminals for Nisqually power project; bids opened at Tacoma, May 18.

Unstated, transformer circuit towers and switchyard structures, Coulee power plant; bids opened at Denver, May 22

Unstated, hangars at unstated airbase; bids in to United States engineer, Portland, Oreg.

REINFORCING BARS . .

REINFORCING STEEL AWARDS

2750 tons, Bureau of Reclamation, Denver, to Carnegie-Illinois Steel Corp., Chicago, $133,320 f.o.b. destination, Coram, Calif.; inv. b-33,137-A; bids April 7, purchasing agent.

2000 tons, Bureau of Reclamation, invitation B-33,137-A, Keswick, Calif., to Carnegie-Illinois Steel Corp., Pittsburgh.

1200 tons, factory, Nash-Kelvinator Airplane Motor Co., Kenosha, Wis., to Joseph T. Ryerson & Son Inc., Chicago; Consolidated Construction Co., Chicago, contractor.

REINFORCING STEEL PENDING

10,000 tons, airplane engine plant, Chicago, for Defense Plant Corp. for operation by Chrysler Corp.; George A. Fuller Co., Chicago, contractor; bids May 20.

5000 tons, armor plate plant, Gary, Ind., for Defense Plant Corp., to be oper-

ated by Carnegie-Illinois Steel Corp.; March, Peterson, Walker & Snyder, Gary, Ind. contractors; bids May 20.

1500 tons, Bureau of Reclamation, invitation B-33,200-A, Coram, Calif.; bids opened.

1500 tons, Keshwick dam and power house, inquiry B-33,200-A, Coram, Calif., for Bureau of Reclamation; bids to Denver May 18.

550 tons, raising Ross dam, Skagit power project; bids to Seattle, June 11.

250 tons, penstocks and power house, Fort Peck, Mont., Fegles Construction Co., Minneapolis; project revived and revised downward from 900 tons.

137 tons, Bureau of Reclamation, invitation 22,548-A, Mountain Home, Idaho; no bids received.

Unstated, tunnel and other units, Nisqually power project; bids opened at Tacoma, May 18.

Unstated, concrete piers, Celilo canal, Columbia river; bids to United States engineer, Portland, June 6; spec. 697.

CONCRETE BARS COMPARED

	Tons
Week ended May 23	5,950
Week ended May 16	12,260
Week ended May 9	4,980
This week, 1941	6,242
Weekly average, 1942	10,750
Weekly average, 1941	13,609
Weekly average, April, 1942	22,105
Total to date, 1941	241,923
Total to date, 1942	209,044

Includes awards of 100 tons or more.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Detroit, Toledo & Ironton, four 2-8-2 type steam locomotives, to Lima Locomotive Works, Lima, O.

Louisville & Nashville, eight 4000-horsepower diesel-electric passenger locomotives, to Electro-Motive Corp., La Grange, Ill.

LOCOMOTIVES PENDING

Lehigh & Hudson River, three 4-8-2 steam engines; contemplated.

CAR ORDERS PLACED

Republic Steel Corp., ten 50-ton hoppers, to American Car & Foundry Co., New York.

BUSES BOOKED

Twin Coach Co., Kent, O.: Twenty-two 44-passenger for Surface Transportation Corp., New York; seven 27-passenger for Peoples Transport Corp., Muskegon, Mich.; five 31-passenger for Mill Power Supply Co., Charlotte, N. C.; seven 29-passenger for Milwaukee Electric Railway & Transport, Milwaukee; four 41-passenger for Southern Coach Lines, Chattanooga, Tenn.; three 31-passenger for Savannah Electric & Power Co., Savannah, Ga.; two 31-passenger for Tri-City Railway Co. of Illinois, Rock Island, Ill.; two 31-passenger for Tri-City Railway Co. of Iowa, Davenport, Iowa; two 41-passenger for Railway Equipment & Realty Co., Oakland, Calif.; one 41-passenger for Birmingham Electric Co., Birmingham, Ala.; one 41-passenger for Houston Electric Co., Houston, Tex.

PLATES . . .

PLATE CONTRACTS PLACED

200 tons, storage tanks, Pure Oil Co., Toledo, O., to Chicago Bridge & Iron Co., Chicago.

Unstated tonnage, fifty-seven 515-gallon fuel tanks, Civil Aeronautics Administration, Washington, to Buffalo Tank Corp., Dunnellen, N. J., inv. 1404, bids April 15.

PLATE CONTRACTS PENDING

5200 tons, 36 to 48-inch welded steel pipe, Defense Public Works, San Diego, Calif., Macco Construction Co., 815 Paramount boulevard, Clearwater, Calif., low on schedule No. 2 at $1,378,361.

PIPE . . .

CAST PIPE PLACED

1100 tons, 24 to 30-inch, improvement Airport Way, Seattle, to United States Pipe & Foundry Co., Burlington, N. J.

215 tons, 16-inch east bay municipal utility district, Oakland, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

CAST PIPE PENDING

17,451 tons, 36 to 48 inch cast iron or welded steel pipe, Defense Public Works, San Diego, Calif.; no bids received on cast iron pipe; reported reinforced concrete pipe low.

2300 tons, various sizes, government job

in Southern California; bids soon.

1400 tons, various sizes, Los Angeles; United States Pipe & Foundry Co., Burlington, N. J. low on 700 tons, American Cast Iron Pipe Co., Birmingham, Ala., low on 466 tons and National Cast Iron Pipe Co., Birmingham, Ala., low on 234 tons.

840 tons, King county water district No. 61, Seattle; bids May 22.

237 tons, 6 to 10-inch Pittsburg, Calif.; bids June 1.

Unstated tonnage, 20,000 feet cast iron soil pipe, small sizes, Panama, sch. 6276; bids May 27.

CONSTRUCTION and ENTERPRISE

Illinois

CHICAGO—Interlake Iron Corp., 332 South Michigan avenue, has let contract for sintering plant to Paul H. Schwederer, 7553 South Chicago avenue, to cost $40,000. R. H. Maveety, 53 West Jackson boulevard, architect.

CHICAGO—Midland Machine Corp., 515 West Thirty-fifth street, has awarded contract to Abell-Howe Co., 53 West Jackson boulevard, for two-story 100 x 350-foot factory addition. Estimated cost $250,000. (Noted May 18).

CHICAGO—Ahlberg Bearing Co., 3025 West Forty-seventh street, has awarded contract for two-story 44 x 558-foot factory addition to Campbell, Lowrie & Lautermilch, 400 West Madison street. Estimated cost $125,000. C. Metz, 80 East Jackson boulevard, engineer.

CHICAGO—Bell & Howell Co., 1801 West Larchmont avenue, has given contract for three-story factory addition to Dahl-Stedman Construction Co., 11 South LaSalle street. Estimated cost $1,500,000. Mundie, Jensen, Bourke & Havens, 39 South LaSalle street, architects. (Noted May 4).

CICERO, ILL.—Brad Foote Gear Works, 1301 South Cicero avenue, has let contract to A. L. Jackson Co. Inc., 161 East Erie street, Chicago, for one and two-story addition. Estimated cost $600,000.

HARVEY, ILL.—Whiting Corp. has plans by Burnham & Hammond Inc., 160 North LaSalle street, Chicago, for one-story 80 x 440-foot manufacturing building, one-story 50 x 125-foot steel forge shop, three-story office building. E. O. Sessions & Co., 120 South LaSalle street, Chicago, engineer.

ROCKFORD, ILL.—Brearley Co., 2107 Kishwaukee street, plans factory extension. Estimated cost $40,000.

Massachusetts

WESTFIELD, MASS.—American Abrasive Co., has awarded contract for two-story 42 x 104-foot factory costing $40,000. M. B. Harding, 6 Elm street, architect.

WORCESTER, MASS.—S. R. Cross, 9 May street, has plans completed by A. Johnson, 390 Main street, for one-story 50 x 155-foot, 40 x 85-foot and 35 x 135-foot manufacturing units. Estimated cost $40,000.

WORCESTER, MASS.—Johnson Steel & Wire Co. Inc., 53 Wiser avenue, plans two factory units costing $40,000.

Connecticut

BRIDGEPORT, CONN.—Edwin Moss & Son Inc., 555 Grant street, has been

awarded contract for factory unit in Connecticut. Albert Kahn Inc., 345 New Center building, Detroit, engineer.

BRIDGEPORT, CONN.—Centerless Grinding Co. Inc., 19 Staples street, has plans nearing completion by L. F. Caproni, 1221 Chapel street, engineer, New Haven, Conn., for one-story 82 x 130-foot machine shop. Estimated cost $40,000.

BRIDGEPORT, CONN.—Producto Machine Co., 990 Housatonic avenue, has plans by A. H. Pokras, 436 Salem street, for $40,000 plant.

EAST HAVEN, CONN.—M. & B. Mfg. Co., 1060 State street, New Haven, has plans nearing completion for one-story 120 x 200-foot factory. Estimated cost $65,000. L. F. Caproni, 1221 Chapel street, New Haven, engineer.

FAIRFIELD, CONN.—Helm Co., 46 Sanford street, has given contract for one-story 50 x 125-foot, 24 x 40-foot and 15 x 35-foot factory, boiler plant and office additions to Harry Maring Jr., Inc., 536 Lindley street, Bridgeport. Estimated cost $40,000.

New York

NEW YORK—S. Parker Hardware Mfg. Co., 27 Ludlow street, has leased building at 208-216 Willoughby street, Brooklyn, and will equip it for making brass, bronze and aluminum castings.

New Jersey

CAMDEN, N. J.—Radio Condenser Co., Copewood and Thorne streets, has plans by George L. J. Neutze, Third and Grand street, for one-story 100 x 250-foot plant. Cost over $40,000.

CRANBERRY, N. J.—Un-Excelled Mfg. Co. Inc., 11 Park place, New York, has let contract for factory building to Frank A. Stewart Co., 1520 Locust street, Philadelphia.

NORTH BERGEN, N. J.—Ecco High Frequency Corp., 120 West Twentieth street, New York, plans factory here.

Ohio

AKRON, O.—Roy G. Firestone, 175 West Bowery, architect, has completed plans for an undisclosed client who will build 13,780 square foot machine shop. Project will include four cranes of capacities ranging from 2 to 15 tons.

ASHLAND, O. — Union Malleable Co., Clark avenue, Jack Jacobson, president and general manager, is changing over more of its facilities to war production.

ASHTABULA, O.—Electro Metallurgical Co., 30 East Forty-second street, New York, plans plant here for manufacture of calcium carbide and ferrosilicon. Project has been approved and will be financed by Defense Plant Corp., Washington.

CINCINNATI—American Tool Works Co., Pearl street and Eggleston avenue, will erect an addition containing 40,000 square feet of floor space.

CLEVELAND—Atlantic Tool & Die Co., Louis L. Hoffman, president, and Paul Guszits, manager, 3167 Fulton avenue, will purchase building at 5115 Tillman avenue if board of zoning appeals will permit. Atlantic will move its tool and die factory to that location and erect 3000 square foot addition costing $33,000.

CLEVELAND—Ohio Crankshaft Co., William G. Dunn, president, 400 Harvard avenue, will increase war production with addition of over 3200 square feet.

MT. VERNON, O.—Hydraulic Press Co. is starting erection of plant building here.

Michigan

DEARBORN, MICH.—Leo M. Bauer, Detroit architect, is preparing plans for an addition and alterations to factory at Ford Motor Co.'s Rouge plant here.

DETROIT—Eagle Screw Machine Products Co., 2126 Howard street, has been incorporated with $50,000 capital to design tools, dies and machinery, by William M. Mazer, 19005 Birchcrest drive.

DETROIT—Process Gear & Machine Co. has been organized to deal in gears and install machinery, by A. W. Klomp, 14851 Grand River avenue.

DETROIT—Cross Gear & Machine Co., Detroit, will erect factory in Fraser, Mich. H. E. Beyster Corp., Detroit,

architect.

DETROIT—Myles Standish has general contract for an $18,000 factory addition here for Defense Plant Corp.

DETROIT—W. S. Pocock Co., Detroit, has contract for alterations to Detroit plant of Pittsburgh Plate Glass Co.

GRAND HAVEN, MICH.—Earl Beckering, Grand Rapids, Mich., has general contract for factory addition here for William H. Keller Inc. Robinson, Campau & Crowe, Grand Rapids, architects.

JACKSON, MICH.—K. & M. Products Corp. has been incorporated with $50,000 capital to deal in metal or plastic products and machinery, by Roy H. Kaywood, 213 Damon street, Jackson.

MUSKEGON, MICH.—Russell Engineering Co., Detroit, is preparing plans for aircraft engine plant here for Continental Aviation & Engineering Corp.

PORT HURON, MICH.—Ayres, Lewis, Norris & May, Ann Arbor, Mich., engineers, are preparing survey for improvements to waterworks pumping station for city of Port Huron.

Pennsylvania

EMLENTON, PA.—Emlenton Works is rebuilding steel plant recently destroyed by fire.

MIDLAND, PA.—Treadwell Construction Co., Midland, E. H. Miller, engineer, is preparing plans for additional manufacturing and assembling facilities.

NORTH CHARLEROI, PA. — Federal Foundry & Supply Co. recently sustained damage to its plant by fire.

WILKES-BARRE, PA.—Hazard Wire Rope Works plans one-story 39 x 80-foot plant addition costing $40,000, with equipment.

Indiana

PORTLAND, IND.—Portland Machine & Tool Works, 121 South Wayne street, plans metal products and plastics plant to cost $40,000, including equipment.

Maryland

BALTIMORE—Rustless Steel & Iron Corp., 1101 Edison highway, has let contract for steel forge plant to Cummins Construction Co., 803 Cathedral street.

Georgia

VALDOSTA, GA.—City, Horace Edmond, city engineer, will soon call bids for expansion of water and sewer systems to cost approximately $1,000,000.

Tennessee

MEMPHIS, TENN.—Memphis Construction Co., 160 Union avenue, Memphis, has begun erection of $600,000 aircraft assembly plant for McDonnell Aircraft Corp., St. Louis. H. C. Bokel, 3964 Arsenal, St. Louis, will supervise construction.

Virginia

BLACKSTONE, VA.—Town has applied to FWA for grant of $98,002 for extension and addition to present sewerage system; $130,953 for addition to waterworks system.

Missouri

ST. LOUIS — Austin Co., 1198 Arcade building, St. Louis, has contract for one and two-story, 145 x 465-foot building. Estimated cost $375,000.

ST. LOUIS—City Pattern & Model Co., 3701 Rutger street, has opened bids for factory addition.

Oklahoma

BARTLESVILLE, OKLA.—Phillips Petroleum Co., Bartlesville, will design, build and operate two plants for manufacture of ingredients of synthetic rubber to be located in southwest.

Wisconsin

WEST ALLIS, WIS.—Bayley Blower Co. will take bids soon for one-story 50 x 72-foot factory addition. L. E. Peterson, 312 East Wisconsin avenue, Milwaukee, engineer.

Texas

FORT WORTH, TEX.—Freese & Nichols, Capps building, are consulting engineers for proposed sewage treatment plant.

HOUSTON, TEX.—A. O. Smith Corp., 817 Niels Esperson building, has let contract to Peterson Bros., 6608 Capitol avenue, for plant.

Nebraska

KEARNEY, NEBR.—Western Mfg. & Supply Co. will erect steel plant costing $50,000.

California

SAN FRANCISCO—Bowie Switch Co.,

815 Tennessee street, will spend approximately $40,000 for plant addition.

Washington

KIRKLAND, WASH.—City will take bids May 28 for sewage treatment plant, plans by H. H. Sisler, engineer.

TACOMA, WASH.—Plant of Peterman Mfg. Co. has been taken over by Maritime Commission and will be leased to Seattle-Tacoma Shipbuilding Co. for expansion.

TACOMA, WASH.—Petrich Shipbuilding Corp., recently incorporated, plans $100,000 plant to include three ways, machine and mold loft building, 150 x 400 feet.

Canada

AMHERST, N. S. — Canadian Car & Foundry Co. Ltd., 621 Craig street West, Montreal, has given general contract to Rhodes-Curry Ltd., 35 Lansdowne avenue, for addition to cost $130,000.

HALIFAX, N. S.—Halifax Shipyards Ltd., Barrington street, has begun work on addition to plant here to cost about $70,000. C. A. Fowler & Co., Capital building, engineer.

CHIPPEWA, ONT.—Norton Co. will reach decision soon regarding further additions to plant here. The Dominion government has approved company's proposal for erection and equipment of electric furnace assembly to cost about $375,000.

COLLINGWOOD, ONT. — Collingwood Shipyards Ltd., Huron street, is considering plans for building to house foundry and molding shops, to cost with equipment about $60,000. Plans prepared by John Wilson, P. O. box 81, Collingwood.

LONDON, ONT.—Webster Air Equipment Co., 111 King street, is considering plans for plant addition here. W. G. Webster, president.

LONDON, ONT.—Columbia Handle Co., Nightingale avenue, will build one-story addition, to cost $10,000.

MERRITTON, ONT. — Houser Machine Works, 236 Merritt street, is having plans prepared by T. H. Wiley, architect, 186 St. Paul street, St. Catherines, who will call bids for construction of addition to cost about $40,000, with equipment.

NIAGARA FALLS, ONT.—Canadian Carborundum Co. Ltd., Stanley street, has given general contract to Robertson Construction & Engineering Co. Ltd., for two additions. Cost with equipment about $75,000.

PLATTSVILLE, ONT.—Canada Sand Papers Ltd., 185 King street, Preston, Ont., has had plans prepared and will let contracts for construction of plant here to cost about $25,000 with equipment.

SARNIA, ONT.—Sarnia Bridge Co. Ltd., 251 Campbell street, has given general contract to Robert McKay, 291 North Mitton street, for plant addition to cost about $25,000.

ST. CATHERINES, ONT. — Thompson Products Ltd., 37 Louth street east, has given general contract to Newman Bros. Ltd., 127 St. Paul street, for plant addition to cost $21,000, equipment extra.

TORONTO, ONT.—Cochrane Tool & Machine Co., Laird drive, Leaside, has had plans prepared by Hanks & Irwin, 2890 Bloor street West for plant addition, to cost $25,000, including equipment.

TORONTO, ONT. — Rogers Majestic (1941) Ltd., 622 Fleet street West, is taking bids for plant addition. J. E. Hoare, 481 Eglington avenue West, architect.

WELLAND, ONT.—Dominion Oxygen Co. Ltd., 150 Bay street, Toronto, has received bids and will let contract soon for plant on Bain avenue here.

WINDSOR, ONT.—Hewitt Metals Corp. Ltd., 235 Hanna street East, has plans and will let contracts immediately for plant to cost about $20,000, with equipment.

WINDSOR, ONT. — Ford Motor Co. of Canada Ltd., 2480 Sandwich street West, plans to start work immediately on alterations to plant, including constant temperature room and machine shop to cost about $25,000, equipment extra.

MONCTON, N. B.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, is taking bids for aircraft repair depot here to cost about $100,000 with equipment, to be operated by Clarke-Russe Aircraft Ltd., Dartmouth, N. S.

SHERBROOKE, QUE. — International Cooperage Co. of Canada Ltd., 989 St. Clair avenue West, Niagara Falls, Ont., has plans for plant here to cost about $50,000.

WINDSOR MILLS, QUE.—Canada Paper Co. Ltd., 407 McGill street, Montreal, is taking bids for addition, two stories, 90 x 100 feet, to cost $60,000. J. Charles Day, 1502 St. Catharine street West, Montreal, engineer.

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MATERIALS

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The following used equipment, specifications approximately as shown:

1—BRIDGE CRANE:

25-Ton Main Hoist
10-Ton Auxiliary Hoist
75 ft. to 78 ft. Span—30 ft. lift
Size of Bridge Rail—Approx. 100 lb.
12 ft. Clearance, Bridge Rail to Roof Truss
230 Volt, D.C. Motors

1—BRIDGE CRANE:

60-Ton Main Hoist, 32 ft. lift
15-Ton Auxiliary Hoist, 40 ft. lift
85 ft. 3½ in. Span
12 ft. Clearance, Bridge Rail to Roof Truss
Size of Bridge Rail—Approx. 100 lb.
230 Volt, D.C. Motors

1—YARD BRIDGE CRANE:

10 to 15-Ton Main Hoist, 35 ft. lift
About 90 ft. Span
230 Volt D.C. or 220 Volt, 3 phase, 60 cycle motors
Yard runway as follows may be included:
35 ft. base of column to top of bridge rail
Approximate length required—200 ft.

1—BRIDGE CRANE:

15-Ton Main Hoist—30 ft. lift
95'6" Span
Clearance above bridge rail—12 ft.
Size of Bridge Rail—approximately 100 lb.
230 Volt, D.C. Motors

1—PLATE SLITTING SHEAR:

To cut 1 in. thick plate
Knives to be 154" or longer
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1—MOVING HEAD DE WALT OR EQUIV. CIRCULAR SAW for alloy work.

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1—THREE ROLL MOTOR DRIVEN SHEET COILER with coil rest and entrance throat; inside coil dia. 9" to 15". Speed 150' per min. 30" to 40" width.

1—MOTOR DRIVEN ROLLER LEVELER 36" to 48" width. 1½" dia. maximum rolls.

1—TENSION REWIND DRUM FOR ROLLING MILL, 30" to 36" wide to tension wind coiled aluminum sheets up to 1/10" including adjustable friction drive for direct connection to mill.

1—CAR TYPE GAS OR ELECTRIC ANNEALING OVEN 650° to 950°, 40" to 60" wide, 12' to 18' long, 24" to 60" high, plus or minus 15%.

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GENERATOR—General Electric Co., continuous current, compound wound generator, Type MP-6-150-225, Form RB-K.W.-150-Amps. 600, R.P.M.-225. No load volts, 240—Full load volts, 250.

ENGINE DRIVE—Erie Ball—cross compound wound engine, 14" x 23" x 18", shaft governor—operating steam pressure 150 lbs./sq. in., exhaust to atmosphere—Sweet valve.

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Above is mounted upon 2" x 24" x 80" slate panel.

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500 H.P. Full Reduction Gear 3.7 to 1.

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1—700 HP Gear Drive, ratio 4 or 5 to 1, high speed shaft 180 RPM.

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Lathe, 42″ x 20′ N-H, Grd. Hd., M.D.
Pipe Machs. 2-4-6-8-12-18″ Williams, M.D.
Straightener, 54″ x 6½″ dia. Rolls, 6 Roll.
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PUNCH, Multiple "E" L & A, cap. 340 tons
SHEARS, Plate 72″ x 1-1/4″ United, M.D.
SHEAR, Plate No. 52 Wms. & White, 100″ x 1″
SHEAR, Squaring 132″ x 1/4″ Wheeling, M.D.
SHEARS, Squaring 54″ and 48″ x 3/16″, M.D.

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WANTED: GENERAL SUPERINTENDENT for Sheet and Steel Plate Fabricating Shop. Good Salary and future for person that can produce. Plant located in Texas. Address Box 693, STEEL, Penton Bldg., Cleveland.

WANTED METALLURGIST
Modern manufacturing plant located in South has opening for Metallurgist experienced in cast steel and iron foundry practice. Please give age, education, experience and salary desired. Address Box 704, STEEL, Penton Bldg., Cleveland.

NIGHT TURN SUPERINTENDENT AND General Molding Foreman wanted by a prominent Electric Steel Foundry. Address Box 699, STEEL, Penton Bldg., Cleveland.

Help Wanted

WANTED: IN JOBBING FOUNDRY LOcated in Eastern Pennsylvania, producing steel castings, acid electric process, ranging from 1 lb. to 3 tons, a man who is thoroughly familiar with heading and gating and has a good knowledge of molding and core making and is capable of handling men; acting in the capacity of assistant to foundry superintendent. In reply, please state age, experience and salary desired. Address Box 635, STEEL, Penton Bldg., Cleveland.

WANTED: MAN WITH GENERAL OFFICE or field sales experience by large reputable manufacturer of seamless and electric welded tubing, alloy and carbon steels. Please apply giving full information, experience, etc. to Box 708, STEEL, Penton Bldg., Cleveland.

WANTED—MAN WITH EXTENSIVE EXperience to serve as assistant superintendent of blast furnaces in large steel company. 35 to 45 years of age with technical training preferred. State salary expected. Address Box 637, STEEL, Penton Bldg., Cleveland.

CONTRACT WORK

HOT DIP GALVANIZING
"A Material Difference"
GALVANIZED PRODUCTS
PRODUCTION HEAT TREATING
COMMERCIAL METALS TREATING INC.
TOLEDO, OHIO

KIRK & BLUM
WELDED MACHINE BASES, PEDESTALS and FRAMES
LATHE PANS
GEAR and BELT GUARDS
Pressed Steel Louver Panels and Cover Plates
THE KIRK & BLUM MFG. CO.
2822 Spring Grove Ave., Cincinnati, Ohio

SUB-CONTRACT WORK WANTED

Listed are a few of an infinite variety of special sheet metal forms.

Sheet Metal Fabrications
Special Forms and Tubes
Metal Boxes, Cabinets, Bins and Racks
Stampings—Light, High Productive
Welding—Spot and Electric
Spray Painting

We can work with the following types of metal: Monel—Stainless Steel—Brass—Copper—Aluminum Steel, hot and cold rolled.

OHIO STOVE PIPE & MFG. CO.
2104 Woodland Ave. Cleveland, O.

SAY IT HERE

If you have facilities to handle additional work. An advertisement in this section will tell others of your capacity, etc. Write STEEL, Penton Bldg., Cleveland.

Send your inquiries for
SPECIAL ENGINEERING WORK
to the
A. H. NILSON MACHINE COMPANY, BRIDGEPORT, CONN.
designers and builders of wire and ribbon stock forming machines.
We also solicit your bids for cam milling

Castings

NORTH WALES MACHINE CO., INC., North Wales, Pa. Grey Iron, Nickel, Chrome, Molybdenum Alloys, Semi-steel. Superior quality machine and hand molded sand blast and tumbled.

FORGINGS

Prompt service on medium heavy hammer forgings. Gear blanks sleeves up to 30" dia., shafts etc. rough or machined.

GENERAL ENGINEERING & MFG. CO.
1523 South Tenth St. St. Louis, Mo.

◆ ◆ ADVERTISING INDEX ◆ ◆

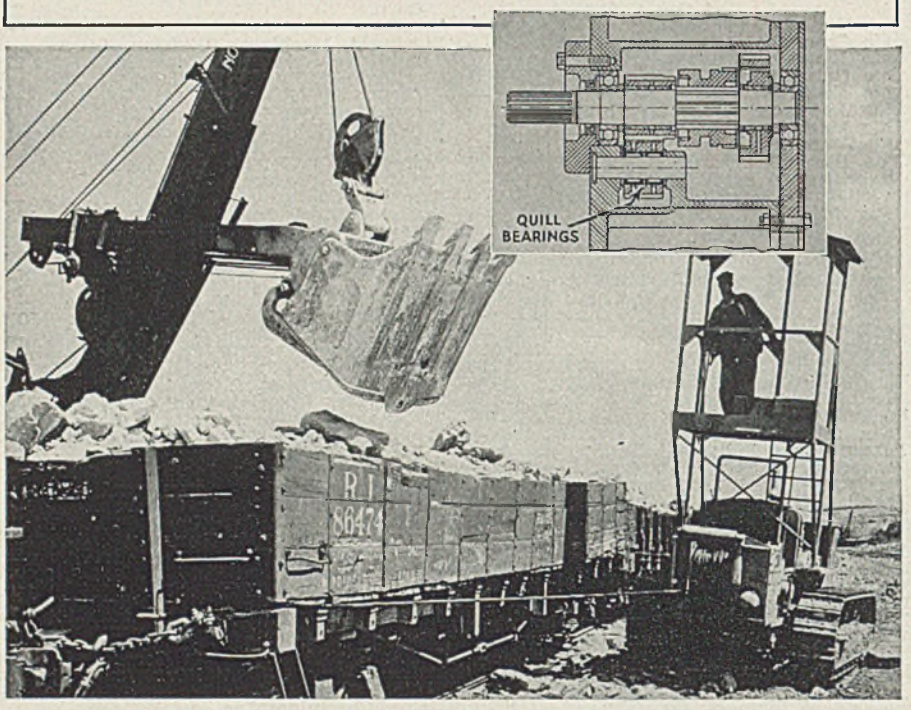
Where-to-Buy Products Index carried in first issue of month.

◆ ◆ ADVERTISING INDEX ◆ ◆

Where-to-Buy Products Index carried in first issue of month.

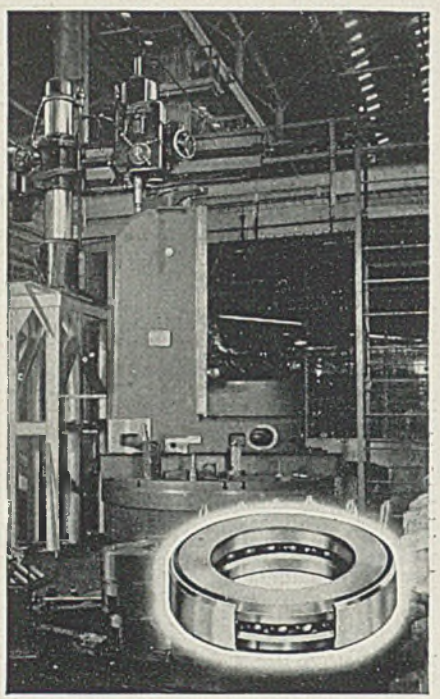
IN THE NEWS

WITH BANTAM BEARINGS

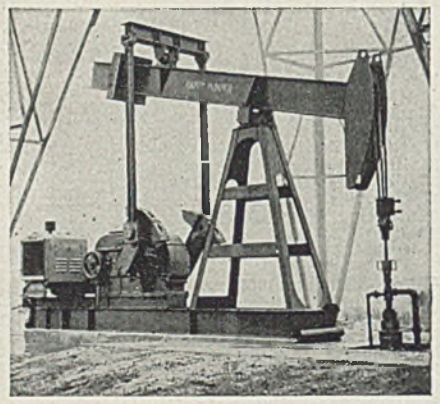


REPLACING A LOCOMOTIVE is all in a day's work for this worm drive towing winch used to move freight cars into position to facilitate even loading. Built by Willamette Hyster Company, it employs Bantam Quill Bearings in the idler gears of the transmission. As shown in the drawing, these compact Quill Bearings are particularly well adapted to the limited clearances available. And, in addition, the high load capacity of Quill Bearings aids the Hyster Winch in handling tough jobs efficiently and with minimum power loss.

IN THE GIGANTIC TASK of moving America at war—"Freightliners" are providing swift, safe convoy for raw materials, munitions, supplies and equipment. Built by Freightways Manufacturing Company, these dual trailer units use Bantam Quill Bearings for long, dependable service.



THE BACKBONE OF INDUSTRY are machine tools such as the radial drill shown here, mounted on a platform for high altitude work in the plant of one of the Nation's largest machine manufacturers. Made by the Morris Machine Tool Company, this drill uses Bantam Radial Ball Bearings—a typical example of Bantam's service in the design and engineering of bearings for all types of applications.



VICTORY OR DEFEAT in this war may depend on oil. Pumping units like this one, built by The Happy Company, are operating on a 24-hour basis to supply this vital source of power for American planes, tanks, and trucks. To assure efficient operation and long service life with a minimum of attention, Bantam Quill Bearings are used in equalizers, center iron saddles, other points of wear. The high unit capacity of these low-cost anti-friction bearings also helps simplify design.

PROMPT DELIVERY OF SPECIAL BEARINGS is offered by Bantam because Bantam is tooled-up to manufacture made-to-order bearings with a minimum of delay. And the cooperation of Bantam's engineers is available to aid you in the design of such bearings. Or, if you have a standard application, remember that Bantam makes every major type of anti-friction bearing—straight roller, tapered roller, needle and ball. No matter how urgent your need or difficult your problem, for experienced engineering counsel or for prompt deliveries on essential jobs—TURN TO BANTAM.