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# STEEL

The Magazine of Metalworking and Metalproducing

# SEPTEMBER 25, 1944

Volume 115—Number 13

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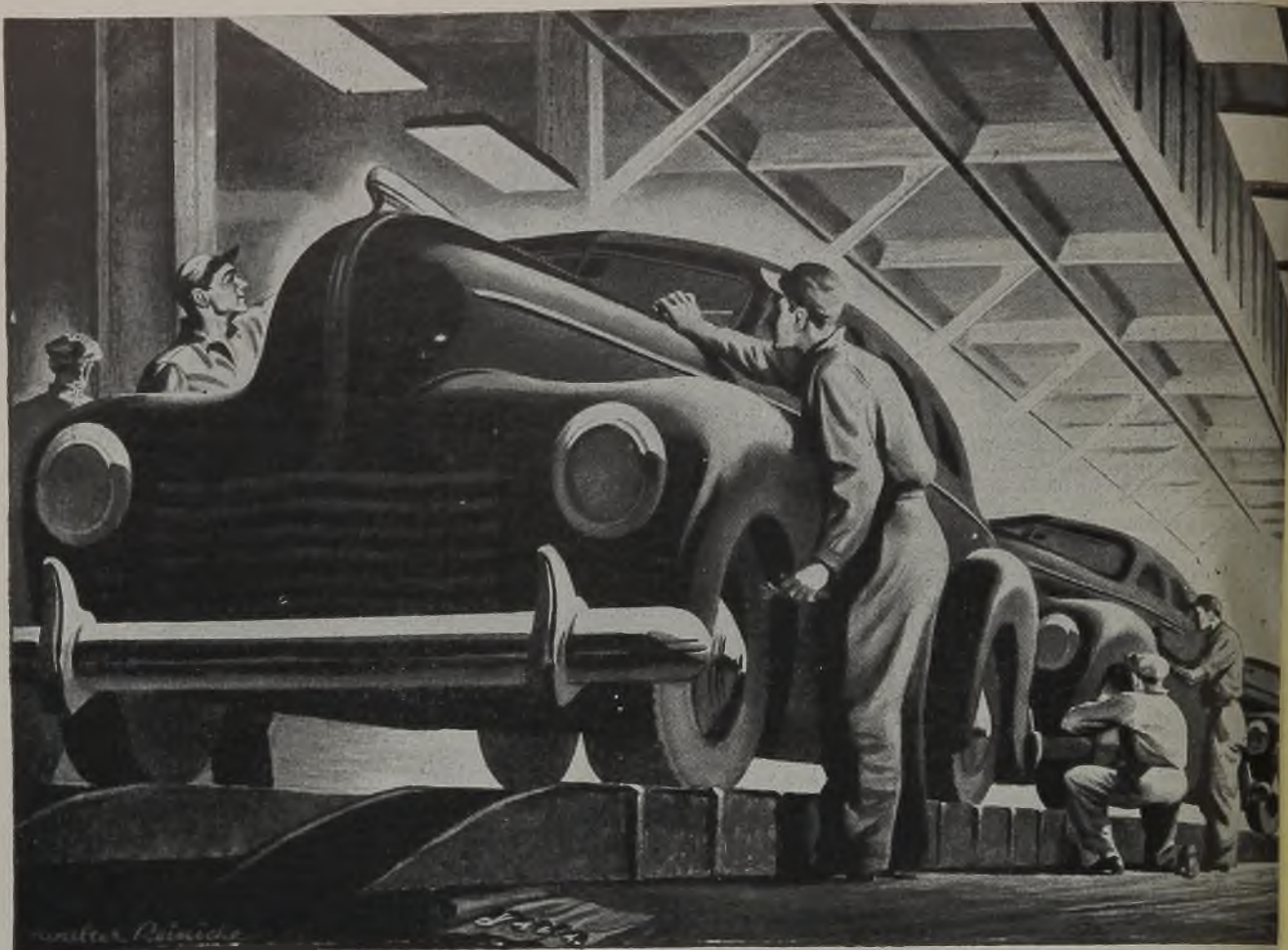
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## November 7, 1944!

Practical politicians speak admiringly of the manner in which Sidney Hillman's Political Action Committee is working to make certain that every member of CIO casts his ballot in the national election on Nov. 7. In their opinion, PAC's system will be as effective in "turning out the vote" on a nation-wide scale as the best performances ever turned in by the highly proficient city machines of Tammany, Hague or Kelly.

One may disagree violently with the motives which prompt these experts to do such a thorough job of inducing voters to go to the polls, but all must applaud the objective of getting out a representative vote. In recent elections the percentage of eligible voters who have actually exercised their right to vote has been shockingly low. There are indications that the percentage in the Nov. 7 election will be even lower.

This comes close to being a national disgrace. It means that a substantial number of millions of Americans of voting age are neglecting a primary obligation of citizenship. It carries a threat to the nation so alarming that if all of us could understand the threat for what it really is, we would begin now—individually and collectively—to outdo Mr. Hillman and his associates in "getting out the vote."

The threat is government by default of the citizenry. France, Germany, Japan, Italy and others have suffered it. When the people defaulted on their obligations as citizens, charlatans seeking power took over their governments. The world chaos of today is a result of the indifference of free people to their rights.

Consider France. Do you remember the picture which appeared in most of the papers when German troops over-ran France? It showed a Frenchman watching the invading columns on parade. Tears streamed down his face. They were tears of shame—shame that his France had become so impotent, shame that he and his people had become so neglectful of their obligations that traitorous leaders had usurped the government.

History has proved that 50,000,000 Frenchmen can be wrong. It remains to be proven whether 135,000,000 Americans can be wrong.

Of one thing we can be certain. If a high percentage of Americans eligible to vote will cast their ballots on Nov. 7, no one can quarrel with the result.

That is why we urge every reader of this page to resolve now to exert his influence to the utmost to get out a representative vote on Nov. 7.

---

**HOLDING THE LINE?** This nation has been fortunate in that inflationary forces have been kept in check throughout the period of intense production for war. Prices have risen moderately, but not enough to start a dangerous upward spiral.

Credit for this accomplishment can go partly to the government for its precautionary measures and partly to the public for its restraint. The credit due the government is marred somewhat by the

fact that its program of "holding the line" has been more a program of annoyance and confusion than of careful planning and equitable administration.

This is evident in its attitude toward wages in relation to inflation. It made much of the "Little Steel Formula." It has used this arbitrary device to help "hold the line." Now, on the verge of an election it probably will reverse itself and yield on points on which it has been adamant until the



present politically propitious moment.

Meanwhile, under the guise of anti-inflation necessity, numerous government agencies have stalled on hundreds of thousands of wage, salary and price situations to the point where grave injustices have resulted. Unaffiliated individuals have paid a terrific price for bureaucratic indecision on anti-inflation matters. —p. 43

**TEAMWORK IN STEEL:** Presentation of the Distinguished Service Award of the Army Ordnance Department to the American Iron and Steel Institute "in recognition of outstanding and meritorious engineering advisory services in war and peace for the development, manufacture and maintenance of ordnance materiel" is a compliment which thousands of individuals in the iron and steel industry will cherish with unusual pride. It comes from an arm of the government which is especially well qualified to understand industry's problems and to appraise the true value of its contributions in preparedness and in war.

The award is particularly significant in that it was granted for services which entailed extraordinary teamwork on the part of numerous individuals and companies. Somebody once said regarding government-steel industry relations: "All the government needs to do is to tell us what is needed; we'll do it."

Apparently Army Ordnance explained the need and the steel men came through handsomely. —p. 48

**TANK STABILIZERS:** A tank whose gunners can fire accurately while it is bouncing over a rough terrain at 15 miles per hour has distinct advantages over one which has to stop to permit its crew to fire. American ingenuity in adapting gyro-stabilizers to tanks is enabling the Allied armies to exploit this advantage over their enemies.

Development of the tank stabilizer follows in the wake of successful applications of the gyroscopic principle to numerous stabilizing problems. Many of these have been utilized for watercraft. Stabilizers for tanks have given manufacturers an opportunity to turn out gyroscopic units on a mass production basis and this fact suggests that the wartime experience may easily lead to a revival of interest in the stabilizing of peacetime land vehicles.

It is not too fantastic to suggest that the "know how" gained in tank stabilizers may be reflected in gyro-stabilizers for railroad passenger cars, highway buses and private automobiles in the postwar period. —p. 78

**MARTIAL WORKSHOP:** With Allied armies occupying practically all of France and Belgium, over-running the Briey basin, menacing most of the Saar district and advancing to within a few miles of the great Ruhr industrial region, the prospect for the continued large-scale production of iron and steel and manufacture of munitions for Germany is hopeless. In fact, the accomplished and threatened curtailment of industrial activity may prove to be a more potent argument for early capitulation than the apparent deterioration of the enemy's fighting manpower.

These losses of minerals and manufactures in the West, coupled with comparable losses on the Russian front, spell doom for the Nazis. Whether or not the captured facilities can be put into service for the Allies in time to count in the final decision, their loss to the enemy is equivalent to a major military defeat.

This situation lends point to Walter S. Tower's suggestion that Germany's industries be placed under Allied control in the interest of future world peace. This is one of the knotty international problems of tomorrow. —pp. 48, 74

**NO WPA FOR EUROPE:** Inquiries by the French for American cars and locomotives are significant on two counts. First, they indicate how quickly a liberated nation can tackle reconstruction. Secondly, they reflect the feverish urge of private enterprise to get going on a wealth-restoring basis.

These factors are extremely important at this stage of developments in Europe. There are officials in Washington who have been envisioning a sort of American-administered WPA for the liberated countries. But first in North Africa, then in Italy and now in France, Belgium and The Netherlands, it has been made clear that the freed people want as little help of the WPA brand as possible. Primarily they want opportunities to restore their own productive activities. They want to grow their own food and to restore their accustomed manufactures and services. They are eager to provide jobs and incomes.

They will want to buy from us chiefly the equipment and supplies that will help them to help themselves as quickly as possible. —p. 49

*E. L. Shaner*  
EDITOR-IN-CHIEF



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# Postwar Period Most Dangerous For Inflation

Industrialists convinced runaway price rise threat will increase rather than diminish when peace comes. Modification of Little Steel formula, hinted by WLB chairman, would force price advances



WILLIAM H. DAVIS . . . . . "Any fool can foresee . . ."

THE probable early modification of the Little Steel formula, one of the cornerstones of the wartime stabilization program, will bring new threats of inflation, leading industrialists predicted last week. Concern is felt particularly of the period immediately following the defeat of Germany.

That the Little Steel formula will be modified before the November elections was intimated by William H. Davis, chairman of the War Labor Board, who said "any fool can foresee" that we are facing a probable change in wage policy. After a WLB "fact-finding" panel had appeared to open the way for a recommendation that the formula be modified (see, Sept. 18, p. 75).

The full WLB will open hearings on the panel's report Sept. 26 and expects to announce its findings during the week of Oct. 9. Modification of this phase of the stabilization program then will be up to the President, and the consensus of Washington observers is that the board's report will be timed to permit the President to announce a wage increase just before the Nov. 7 election.

To most observers the political aspects of the case are of secondary importance. The probable inflationary results of a then, nation-wide relaxation of the general wage increase curbs.

From the inflationary angles of the problem there is considerable disagreement. Some economists, especially those employed by the unions and many in the administration, hold that soon after the defeat of Germany industry will return to the 40-hour work-week. They hold that an increase in wage rates will only partially compensate for the loss of over-

According to their arguments, the "home" pay of a steelworker on a 40-hour week will be less, with an increase in rates, than the average em- ployee now receives. They argue the return to the shorter work-week, without time, will result in a saving of from

6 to 8 cents an hour. They contend another 6 to 8-cent hourly saving will result from the down-grading of workers who have been up-graded during the manpower shortage.

More conservative economists believe that granting of a wage increase must necessarily be accompanied by an increase in prices and unavoidably will give a fillip to inflationary forces.

Because steel is regarded as the barometer of the entire productive economy, any increase in either steel wages or prices would have repercussions throughout all industries. A grant of higher wages to the steelworkers admittedly would be followed quickly by similar concessions to other industrial workers.

### Greatest Inflation Follows War

Representatives of the steel industry have argued that the weeks ahead will be the most dangerous to the stabilization program. They point out that the greatest inflation in the last war occurred in the months following the armistice and not while the fighting was in progress. During World War I prices rose about 150 per cent above the prewar figure. The increase continued for nearly a year and a half after November, 1918, and the most rapid rate of increase came after the war's end.

A recent survey conducted by a group of American life insurance companies among the country's top industrialists revealed that most of them are convinced that threat of a runaway rise in prices will increase rather than diminish when peace comes.

The same industrialists estimated the

basic costs of steelmaking, largely labor and materials, have increased 25 per cent since 1939.

Steel producers, in their arguments before WLB panel during the past summer, estimated the cost of seven of the union's 14 demands which were considered by the panel would be \$691.4 million. In this connection, it was noted that the union was promised that any wage increase granted would be retroactive to the time of the board's acceptance of the case nearly a year ago. Distribution of a large sum of accumulated "back pay" would unquestionably be a shock to an economy in which purchasing power already exceeds available civilian goods by a wide margin.

In presenting their case to the WLB panel, the steel producers estimated that if the wage increase asked by the steelworkers were extended to all workers, the result would increase annual wage payments by \$13.5 billion dollars.

"Such a tidal wave of wage increases," they contended, "could wreck the stabilization program which is being maintained on such precarious balance."

Wage increases no longer can be offset by decreasing unit costs due to expanding production, they said. As a matter of fact the trend soon will be reversed as munitions cutbacks increase, and unit costs likely will increase due to contracting production.

In this connection, it is noted that one major steel producer's "break-even point" has increased from 60 per cent of capacity to 80 per cent of capacity.

Dr. Emerson P. Schmidt, director of economic research for the Chamber of



Commerce of the United States, in a study on inflation in the postwar period sounds a warning that the national economy will either bog down or sky-rocket into inflation if the philosophy of higher wages is practiced.

"Given the past patterns of behavior," he writes, "one can predict with high confidence that if we achieve anything like full employment for a short spell in the postwar, strikes will multiply and proliferate. Wage increases will be widespread, costs will rise and the consumer and especially people with fixed or lagging incomes will become the 'forgotten men'. Business incentives will deteriorate unless prices are allowed to migrate upward—inflation. New enterprises may be difficult to establish and employment may be discouraged.

"In the 1930s, when the union movement was much smaller and had much less power than it has today, every partial recovery was promptly attended with an upward revision of wages and new socially created labor costs until, by 1940, we finally exceeded the 1929 output with 8 million people (according to the statistics) still frozen out of employ-

ment. Every recovery spurt was quickly checkmated. New ventures were difficult to launch. Unsettled tax policies and constitutional instability reinforced the deflationary forces.

"With power must go responsibility. The American labor movement at times has not shown adequate appreciation of what is the nature of this responsibility in the light of its power. Labor has more to lose by the extremes of inflation and deflation than most other groups because it has smaller reserves.

### "Economy May Bog Down"

"The labor movement in this country is now so large, commands so many votes, that it may be difficult for society to control it. Therefore, unless labor leaders themselves develop, a responsibility, co-ordinate with their power, for the effective functioning of the economy, one of two things must happen: Either the economy will bog down under an unfavorable cost-price relationship and the destruction of favorable profit expectations, and therefore reduced production and employment, or we will move into a period of upward price and wage

spiral, the latter re-enforced by an inflationary debt and Treasury policy.

"So long as the labor movement presses the philosophy of higher wages in spite of a large army of unemployed and adds new employment expense without recognition of the other half of the equation, namely, that wages are also costs, we cannot expect to attain reasonably full employment. Neither low nor high money wages should be our objective; wages adjusted to encourage the economy to function at high levels of production and employment and with regularity should be the goal."

Dr. Schmidt points out that industry during the war has had little or no selling expense and this has resulted in enormous reductions in operating costs. At war's end, the markets must be penetrated, sales and distribution organizations will have to be re-established, at a considerable cost.

"For this reason, other costs will probably have to be cut or prices increased in order to restore the incentive to expand and to mitigate the threat of insolvency. If prices are raised in order to restore the incentive to produce and expand, the question arises as to whether this will set in motion a wave of strikes and wage demands, in this day and age when everyone seems to be carrying a cost-of-living chart in his vest pocket."

That no justification for modification of the Little Steel formula is to be found in the report of the public members of the WLB steel wage panel is the contention of John A. Stephens, chairman of the Steel Case Research Committee, and a vice president of the United States Steel Corp. Mr. Stephen said:

### Cites Steelworkers Wage Increases

"Since January, 1941, increases in the wages of the steel workers have far outstripped the increase in cost of living.

"The Bureau of Labor Statistics of living index rose about 25 per cent from January, 1941 to June, 1944, while the average weekly earnings of steel workers during that period increased over 61 per cent.

"Both the Congress and the President have recently examined and affirmed the national economic stabilization program

"On June 30, 1944, in approving the bill extending the stabilization act for another year, the President said that represented the considered judgment of the Congress that the existing stabilization policies and programs are sound and should be continued; and that in passing the act the Congress rejected all pleas which would require any general change in the wage, price and subsidy policies now in effect.

"Economic conditions have not changed substantially since the President made that statement. The panel report shows no sound economic ground for scrapping the Little Steel formula by granting the union wage demand.

"The nation is entitled to assume that the basic principles of economic stabilization will not be abandoned."

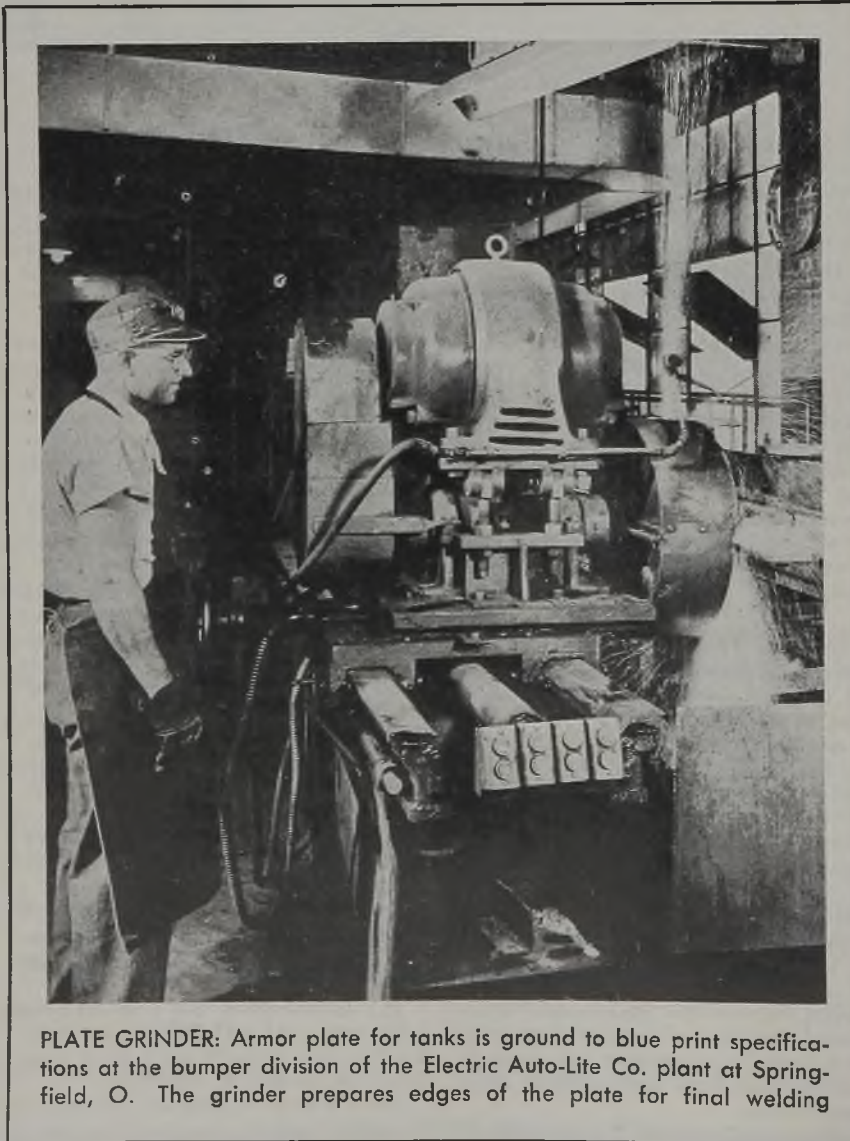


PLATE GRINDER: Armor plate for tanks is ground to blue print specifications at the bumper division of the Electric Auto-Lite Co. plant at Springfield, O. The grinder prepares edges of the plate for final welding



# Adopt Procedure for Processing Miscellaneous Steel Cases

PROCEDURAL recommendations for processing the cases of the 600 "miscellaneous" companies which have contracts with the United Steelworkers of America were adopted last week by the WLB.

The action of the board contemplates that, after its decision in the "basic steel" cases is announced, a reasonable period will be allowed for further collective bargaining between the parties in the miscellaneous cases, following which any cases or issues which still remain in dispute will be referred to the various

regional WLB boards for processing.

A request by any company which prefers to have its case referred to a regional board immediately after the "basic steel" decision is announced, without further collective bargaining, will be granted.

The action of the board constitutes a change in the procedure originally contemplated, under which some or all of these cases were to be heard by the "miscellaneous" panel itself, either in Washington or elsewhere.

## Present, Past and Pending

### MANUFACTURING INDUSTRY PAYROLLS TO DROP ONE-THIRD

WASHINGTON—Total payments to wage earners in the manufacturing industry under peacetime full employment will be one-third less than the current level of \$32,000,000, exerting its usual depressing effect upon agricultural prices, farm income and distributive profits, according to the Commerce Department.

### NATIONAL TUBE ACQUIRES TUBULAR ALLOY STEEL CORP.

PITTSBURGH—Arrangements have been completed for acquisition by National Tube Co., U. S. Steel Corp. subsidiary, of buildings and properties of Tubular Alloy Steel Corp., Gary, Ind., which will become an operating division of National Tube Co. on Oct. 1. Tubular Alloy Steel Corp. has been operating as an independent U. S. Steel Corp. subsidiary.

### CARNEGIE-ILLINOIS ESTABLISHES VETERANS PROGRAM

CHICAGO—Carnegie-Illinois Steel Corp. has established within its industrial relations department a program looking to re-employment of former employes returning from the armed forces and has appointed Maynard G. Montgomery as head of this activity.

### NEW INDUCTIVE TRAIN TELEPHONE SYSTEM COMMENDED

WASHINGTON—Pennsylvania railroad has informed the Federal Communications Commission that it regards its new inductive train telephone system, in which the transmission paths are confined to rails and adjacent wires, as the most satisfactory means for providing communication with and between moving trains.

### ALUMINUM UTENSIL MAKER STARTS RECONVERSION

LOS ANGELES—Kinney Aluminum Co., this city, has been authorized to start manufacture of aluminum utensils which will be on the market by Nov. 1. The regional office of the War Production Board has on file 60 applications for immediate reconversion to consumer goods.

### SPANG-CHALFANT HONORS VETERAN EMPLOYEES

PITTSBURGH—National Supply Co.'s Spang-Chalfant division, Etna, Pa., honored a group of 288 veterans recently with a dinner and entertainment. Of the total number, 48 had been with the division 40 to 55 years and 66 had been with the company 35 years or longer.

### BRITISH RECONVERSION PLANS STRESS MODERNIZATION

NEW YORK—British government plans for industrial reconversion will stress the need of modernization to enable British plants to compete advantageously in world markets. This was indicated by a program announced in Manchester, England, for re-equipment of the cotton spinning industry to bring its mechanical efficiency up to American standards.

### BOESCHENSTEIN TO GET IMPORTANT WPB POST

WASHINGTON—Harold Boeschstein, former president of Owens-Corning Fibreglass Corp., is to be named deputy operations vice chairman of WPB. He installed the Controlled Materials Plan in 1942. Stacy May, director, Statistics Division, is leaving WPB, probably by the end of September.

The panel report took account of the board's previous statement that the "basic steel" decision would not determine the issues in the "miscellaneous" cases. The panel majority pointed out that the union demands were the same in the "basic steel" and "miscellaneous" cases. The majority believed that the board's decision in the "basic steel" cases would undoubtedly eliminate or narrow the issues in the "miscellaneous" cases, and that in many instances the remaining issues would be resolved by further collective bargaining.

The recommendations were as follows:

1—That the cases before the miscellaneous panel be referred to the regional board for processing in accordance with their usual procedure.

2—That referral of these cases to the regional boards be deferred until after the board's decision in the "basic steel" case is announced. Requests of companies which then desire immediate reference of their cases to regional boards should be granted. Cases of other companies should be held before the national board for a reasonable length of time to give the parties an opportunity for further collective bargaining. Any cases or issues which are not resolved by collective bargaining should then be referred to the regions.

3—That the board reiterate its assurance to all these companies that their cases will be decided on their own merits if they go to hearing, and that they will not be predetermined by the "basic steel" case.

4—That if and when these cases are referred to the regions, the regional boards be instructed to use their own discretion with respect to the grouping of cases for joint hearings, provided, that in any event any company which desires to do so will be permitted to make its own individual presentation.

5—That the special motions to dismiss made by 11 companies be ruled on promptly after receipt of the union's answers to these motions.

6—That the motions to dismiss on general grounds made by a number of the companies be ruled on promptly by the board.

## Second WLB Panel Approves Breaking of Wage Ceiling

Wage stabilization policies of the administration were further undermined last week when another War Labor Board panel declared that the Little Steel wage formula had been broken to keep earnings abreast of the cost of living.

The panel, which heard the demands of the United Electrical, Radio and Machine Workers-CIO for a 17-cent hourly wage boost, said the increase could be granted by the President because living costs have gone up beyond the Little Steel formula, which froze wages at 15 per cent above the January, 1941, level.



# Steel Producers Look Ahead as War Demand Shows Signs of Easing

Consumers being sounded out on their prospective civilian steel needs in anticipation of prompt switch of facilities from war production when conditions permit. Some tonnage reported booked on tentative basis

STEEL salesmen are beginning to beat the bushes again for business—civilian business.

With the European war apparently going well, possibly being in its closing phases, and with signs multiplying of a likely gradual expansion in civilian goods production over coming months as war demand tapers, producers are starting to sound out customers on their prospective peacetime requirements.

And this drive for civilian tonnage, in the opinion of many observers, is not getting under way any too soon. For several weeks past noticeable contraction in new war steel orders has been in evidence with consumers playing the game cautiously as they seek to trim raw material inventories in anticipation of V-E day and substantial cutbacks in war goods orders.

Few, if any, gaps have appeared as yet in rolling mill schedules as a result of this more conservative buying mood of customers. Mill books still are loaded with war tonnage calling for deliveries into next year. In fact, up to the end of August order cancellations were just about balanced out by new bookings. The situation today, however, appears somewhat different. Bookings to date in September are said to indicate soft spots in demand which appear to forecast early easing in the tight delivery situation which has prevailed in most products for months, and with American troops fighting on German soil the tendency for consumers to hold back in their ordering is increasing. As a matter of fact, several large steel producers report that since the opening of September bookings have not equalled production with the result that order backlogs are running down.

This, alone, justifies a sales drive at this time. In addition, however, the producers are reported being encouraged by Washington to go out and drum up civilian business to replace war ton-

nage which may quickly disappear from their books should Germany suddenly fold. Needless to say, it isn't taking much prodding to get the steel men on the road.

Indicative of government policy with respect to the acceptance of civilian orders is the statement to steel producers issued last week by Norman W. Foy, director, Steel Division, WPB. Said Mr. Foy:

"It is anticipated that as of V-E (Victory in Europe) day producers will be authorized immediately to schedule and ship any and all orders after fulfilling their obligations with respect to properly validated CMP orders.

"In the meantime a question has arisen as to the rights of producers to



accept such unrated orders under present regulations, and this latter is intended to clarify the question.

"The present Controlled Material Plan authorizes a producer of controlled materials to accept "delivery orders" i. e. any order acceptable to the producer whether or not it is covered by allotment and the proper certification. However, at the present time orders may not be scheduled for production or shipment unless and until they are later validated with an allotment and the proper certification.

"Therefore under the present regulations a producer is the sole judge as to whether or not it is desirable for him to accept orders other than CMP orders to be held pending the time when regulations will permit of their being scheduled and shipped. Present circumstances lead us to suggest that you promptly consider what effect the preliminary acceptance of orders will have upon continuing an orderly flow of production at your mill and at the consumer's plant after V-E day.

"In the event there should be, prior to V-E day, an influx of cancellations resulting in the creating of idleness of facilities which should be operating pursuant to production directives, will you please so inform us as soon as this situation arises."

Civilian tonnage so far booked for future delivery is not large. However some orders have been taken, these to be formally entered on books when government regulations are lifted to permit fitting them into mill rolling schedules.

## CIVILIAN STEEL

### CLEVELAND

The regional War Production Board has 10,800 tons of carbon steel and 2700 tons of alloy steel for distribution to manufacturers of civilian goods in Ohio, West Virginia, Kentucky and western Pennsylvania during fourth quarter of 1944. Up to this time the only steel available has been in idle and excess stocks.

Allocation of this steel will permit the regional office to grant purchase authority for new production steel to manufacturers whose applications under the "spot" procedure are approved. From Aug. 15, to Sept. 15, the first month the "spot" plan was in operation, 183 manufacturers in this four-state region applied for permission to return to civilian production. Eight applications were approved, 56 have been denied and the others are now being analyzed.





Scene in a typical steel warehouse. Distributors are expected to experience heavy demand for products in reconversion period as consumers seek spot deliveries to facilitate prompt switch from war work

redound to the advantage of the steel warehouse industry. Expectations are that initial steel orders in the reconversion period will be relatively small and for the most part will gravitate to the steel distributors. This is because much of the tonnage will be for experimental models, and also because of the fact many manufacturers will be feeling their way. Indications are the warehouses will be in position to care for most of this class of business since stocks in most products are in fair balance, though in certain lines, such as sheets, jobber inventories will have to be materially enlarged.

**Point Thinking Toward V-E Day**

Currently, thinking in industry is increasingly pointed toward V-E day (Victory in Europe). However, there is no certainty that there will be a V-E day even though the steady progress of the Allied armies encourages hopes of an early cessation of hostilities in Europe. Views now are being advanced in responsible quarters that it is quite possible complete collapse of Germany may be delayed for months, units of the German army continuing to offer resistance indefinitely, so that surrender will be piecemeal and over a period of time. Whether this will slow up reconversion to civilian goods production, of course, is problematical. Much will depend upon how effective German resistance proves to be. For the most part, however, it is believed that from now on emphasis on civilian production will steadily mount with more and more companies reverting to their normal activities as they complete war contracts and an easing in the labor supply develops.

In this connection recent comments by J. A. Krug, acting chairman, War Production Board, are significant.

According to Mr. Krug, contrary to an impression which has spread widely, the WPB's "spot authorization" procedure is not being junked.

"I don't know when the war is going to end, and to my knowledge no one in Washington does," he said. "Our plans are premised on going ahead full blast with war production as long as there is need for war production, and at the same time have enough flexibility so that we can swing our resources into peacetime production—production of civilian goods—when the military situation permits.

"We are relying on the 'spot authorization' procedure to meet the situation between now and the time Germany collapses. We have the mechanics and the flexibility in that procedure to deal with local situations as they develop between now and the time of those very large cutbacks that will come when Germany collapses."

From Aug. 15, when this system was put in effect, through Sept. 7, said Mr. Krug, 1106 "spot authorization" applica-

(Please turn to Page 162)

Meanwhile, such forward booking provides consumers with an opportunity to shape up their needs sufficiently in advance to assure them of fairly prompt deliveries when the big day comes.

Victory in Europe is expected to be followed by a sharp slump in demand for steel. How long the lull will last will depend upon the speed with which the manufacturing industry, relieved from war production, can reconvert to normal lines. Reconversion in some lines will be fairly prompt, but observers point out that the large steel consuming industries, such as automobile, may be much slower in getting back into production than the relatively smaller consuming fields where the reconversion job will be less onerous.

Particularly encouraging in connection with reconversion are advices from Detroit to the effect the War Production Board has granted approval to three automobile builders to prepare for resumption of automobile production. Applications of Chrysler Corp., Fisher Body Division, General Motors Corp., and Ford Motor Co., each involving less than \$25,000 a month, are reported approved by the Detroit regional WPB office under priorities regulations No. 23 which permits the building of experimental models. In this action observers sense a desire on the part of government officials to hurry along as far as possible

under existing circumstances reconversion in the automotive field, which not only is a large consumer of raw materials such as steel, but is generally considered the largest peacetime employer of labor. Several months ago, it will be recalled, industry spokesmen said they thought it would take the auto builders from three to ten months to completely reconvert from war production. If this time lag can be shortened appreciably by letting the auto builders get preparatory work out of the way now it certainly would be a contribution to speeding up ultimate changeover.

**No Interference With War Work**

In engaging in this reconversion work the automobile companies have agreed that planning will not interfere with war work of high urgency; that workers involved will be limited to planning engineers and technicians; that the number of workers assigned to the job will not exceed 1 per cent of the company's employment; and that work will be confined to five types of preparation: 1—Correction of weaknesses in 1942 models; 2—bringing necessary material specifications up to date; 3—planning plant layout; 4—planning minor appearance changes from 1942 models; 5—related preparatory work.

The fact that reconversion may be effected slowly in many directions should



# Steel Institute's Service in War Effort Wins Army Ordnance Award

*Outstanding engineering advisory service to nation in development, manufacture and maintenance of ordnance material recognized. W. S. Tower, president, accepting award, suggests control of aggressor nations' industries in interest of peace*

THE STEEL industry came in for a signal honor last Wednesday, Sept. 20, in the presentation to the American Iron and Steel Institute of the Distinguished Service Award of the Army Ordnance Department at a luncheon in the Waldorf Astoria, New York.

The award was presented to Walter S. Tower, president of the institute, by Major Gen. G. M. Barnes, chief of Ordnance Research and Development Service, "in recognition of outstanding and meritorious engineering advisory services, in war and peace for the development, manufacture and maintenance of ordnance material."

Institute committees of operating and technical men in the industry through the war assisted the Ordnance Department, as well as other branches of the Armed Services, in the development of steels that conserved alloys, steels that provided greater strength and steels that helped achieve new destructive power for projectiles.

At the same time such developments

as the use of seamless steel tubing for gun barrels helped provide the United States with an abundance of weapons in a comparatively short time.

Commenting on what industry has contributed to the many new developments in warfare through research and practice, Mr. Tower directed attention to the ways for maintaining peace. He believed that control should be exercised over certain industries in aggressor nations in order to keep peace. Such control, he declared, could be made only after careful study of relations of such industries both to peace and to war.

"What such studies would indicate as to the type and extent of control necessary can hardly be set forth offhand," he said. "But the subject is worthy of the most serious consideration by those whose responsibility and opportunity it is to try to preserve peace in the world."

General Barnes stated that by the use of overwhelming firepower, the United States can seize any desired place with a minimum loss of men.

"In the final analysis, firepower is steel and still more steel," he declared.

After reviewing the co-operation which existed between the steel industry and the Ordnance Department prior to the outbreak of war, General Barnes asserted that "without the Ordnance prewar industrial mobilization plans, over 80 per cent of which were effectively used in this war, at least six months and possibly more would have been lost in the conversion of American industry."

B. F. Fairless, president, United States Steel Corp., and vice president of the institute, introduced General Barnes and Mr. Tower, with the latter introducing Quincy Bent, Bethlehem Steel Co., chairman of the institute's committee on manufacturing problems, and O. U. Cook, Tennessee Coal, Iron & Railroad Co., chairman, general technical committee of the institute.

Mr. Bent pointed out that in 1943, 7,450,000 tons of finished steel, 11 per cent of total output, went directly into ordnance. Due to the low yield of this type of work, this meant anywhere from 13,000,000 to 15,000,000 tons of ingots or about 15 per cent of capacity. This was more than was consumed by the country's entire civilian population at the turn of the century, he pointed out.

Mr. Cook paid tribute to the work of the 21 committees of the institute interested in the improvement of quality of steel products, and to the close co-operation afforded by the Ordnance Department.

## Cites Blast Furnace Anniversary

General Barnes pointed out that the date of the presentation, Sept. 20, had a special significance for the occasion as it was the 300th anniversary of the building of the first American blast furnace at Saugas, Mass.

Paying warm tribute to members of the American Iron and Steel Institute, he said that early in the war it was necessary for the Ordnance Department to make vital decisions concerning the shell steel compositions to be employed, adding that a mistake would have been fatal. The institute worked closely with the Ordnance Department to determine these compositions and it has not been found necessary to make any changes in those thus selected.

Continuing, he said, "your technical committee on cold finished bars made a contribution to the rapid production of fuze components and certain types of artillery shell. Another committee on wire rod and wire assisted in developing certain grades of spring wire heretofore obtained principally from foreign sources.

"Important contributions also were made in alloy bullet core compositions by your technical committee." He said that another of the Ordnance Department's serious problems among many in which the steel institute effectively cooperated, involved the proper method of packaging steel products for overseas shipments.



Ordnance Distinguished Service Medal was presented to the American Iron and Steel Institute last week for its contributions to the war effort. Shown at the Waldorf Astoria hotel, New York, are left to right: Maj. Gen. G. M. Barnes, chief, Ordnance Research and Development Service, B. F. Fairless, president, U. S. Steel Corp. and vice president of the institute, and Walter S. Tower, president of the institute, receiving the award



# France To Buy Rail Equipment

*Huge inquiry for rehabilitation of French railroads reported circulating. Other export business in prospect*

NEW YORK

HEAVY export demand for railroad rolling stock appears to be shaping up for placement in the early postwar period. Rehabilitation of European facilities promises to provide a healthy volume of business in the opinion of market authorities.

This is borne out by tentative inquiries now circulating for from 74,000 to 75,000 freight cars and for steam locomotives from 1360 to 1600.

The inquiries are reported being circulated by the provisional government of the French Republic, 1800 Massachusetts avenue, Washington, and are regarded as the forerunner of other large rehabilitation demands from Europe.

As the devastated countries of Europe will undoubtedly wish to make as many of their own repairs and replacements as possible themselves so as to provide employment for their own labor, actual needs unquestionably will run much heavier than the volume of equipment which will be placed in this country. There will be a period pending repairs to European shop facilities, however, when European builders will not be able to handle promptly the urgent demand for equipment and consequently will have to place a substantial volume of business here if the roads are to get back on their feet quickly.

The equipment lists now being issued are tentative, with purchases contingent upon policy as developed by whatever government is finally set up in France. As to financing, that presents a question. France is known to have substantial gold reserves in this country but no indication is given as to just what terms of payment will apply on any equipment business placed here.

Other European countries are expected to look to this market for railroad equipment just as soon as conditions permit.

From still another angle the export market for railroad equipment is looking up. Orders aggregating several million dollars for freight cars, passenger cars, locomotives, rails and accessories



*Much American-built equipment will be required to replace European railway rolling stock destroyed by Allied bombing or by Nazi demolition. Above is shown wreckage caused by American bombings near Carentan, France, during the invasion. NEA photo*

are reported to have been placed here in recent weeks by South American countries for postwar delivery.

South American prospects in the field are said to be unusually promising. For example it is understood some Latin American countries are planning trackage increases of from 52 to 100 per cent and substantial replacement of existing equipment.

Freight car orders from South America now on American builders' books are understood to include some 2000 units with inquiries indicating 5000 more will be placed within the next year.

Financing of this South American

business presents something of a problem, it is said. In order for American equipment builders to obtain this business they may have to become finance agents since little of the work is on a cash basis. Under regulations of the Export-Import Bank covering manufactured goods for South American markets the bank will underwrite up to 75 per cent of the cost, the manufacturer financing at least 25 per cent without recourse to discounting the notes with commercial banks. Some manufacturers feel that to carry 25 per cent of the cost of an order would tie up considerably more money than they would care to lay out.

## Steelmaking Capacity Rated at 94,054,550 Tons at Midyear

STEELMAKING capacity in the United States at the virtual conclusion of the tremendous emergency expansion program is rated at 94,054,550 tons of ingots and steel for castings per year, according to the American Iron and Steel Institute.

Blast furnace capacity is rated at 68,446,310 tons annually. Since January, 1940, there has been a net increase of over 12,700,000 tons in annual blast furnace capacity and of more than 12,400,000 tons in steelmaking capacity. Costs of financing that program exceeded \$2 billion. Slightly more than half the total cost was financed by companies in the industry, and the remainder by the government.

The capacity figures as of July 1 reflect wartime additions and also take into account reductions in capacity of a few older furnaces as a result of inability any longer to operate them at emergency pressure. As of July 1, 1944, open hearth furnace capacity was rated at 82,604,600 tons as against 82,223,610 tons in January, 1944. Bessemer steel capacity was rated at 6,074,000 in July, unchanged from Jan. 1, 1944. Electric furnace capacity was rated at 5,372,150 as of July 1, compared with 5,350,880 tons in January. The capacity for producing steel by the crucible practice is rated at 3800 tons, no change since the first of the current year.



# Thompson Products To Contest Voiding of "Free Speech" Election

*Regional board upholds unions' protests against company's speeches and bulletins, although approving conduct of balloting. Case may be first major test of employer's right to confer with workers in labor relations*

## CLEVELAND

"WE will fight this case for freedom of speech every step of the way." This was the assurance of officials of the Thompson Products Inc. and Thompson Aircraft Products Co., this city, after a regional director of the National Labor Relations Board last week recommended the voiding of a second election in which outside unions were overwhelmingly defeated in their contest to become collective bargaining agencies for the companies' employees.

The second election, held Aug. 30 and 31, gave a 3 to 1 vote against the outside union. The results were contested by the United Automobile Workers-CIO and the International Association of Machinists-AFL on the grounds that the company had interfered in the election.

The issue was clearly one of free speech. Frederick C. Crawford, president of the companies, addressed employees before the election. The companies had issued leaflets to employees explaining the issues in the election. The case probably is one of the first major tests of an employer's right to speak to his employees on the subject of labor relations under the Wagner act.

Commenting on the regional office's recommendation, R. C. Livingstone, vice president of the companies, said: "It is scarcely a surprise when the NLRB objects to an employer's exercise of freedom of speech or freedom of the press.

"Naturally we will file objections to the regional office's report and will contest the matter in the hearing which probably will be held by the national board. Thompson employees have twice overwhelmingly rejected both the CIO and the AFL and there is little doubt they will do it again if another election is held.

"Significantly, the board found no fault with the conduct of the election. The employees now have twice voted their will. One of these days their decision ought to be considered final."

The recommendation for voiding the results of the election was filed with the national board by Walter E. Taag, director of the Cleveland regional office of the NLRB. Mr. Taag based his recommendations on findings resulting from investigation of complaints by the CIO and AFL unions that the company interfered with the election.

Mr. Taag's recommendation ruled out union complaints that the election was improperly conducted. He said there

was no evidence to support union allegations that the company obtained the voting of supervisors, ineligible office workers, former employees, or employees hired after the date which determined eligibility.

"However, the objections concerning the actions of the company appear to have merit," Mr. Taag said. "Although the company's argument is that its propaganda was merely intended to answer the misstatements by the unions, a careful reading of the speeches and literature shows that the company went a great deal farther than simply replying to alleged false statements.

"Through its *Let's Have the Truth* bulletins, speeches, distribution of overseas hats with company slogans on them, the company made itself, in fact, a party to the election and put on a strenuous and effective campaign.

"It has already been established that the company is responsible for the activities of the AWA and the Brotherhood of Independent Workers. Thus any literature put out by them must be considered as part of the company's campaign."

Mr. Taag then quoted a decision by the United States Circuit Court of Appeals to the effect that "while manage-

ment may have a right under some circumstances, to express its opinion as to a union or between unions, such right certainly does not extend to the point where it becomes a participant in a contest in which it is not a party."

Should the NLRB ultimately decide to accept the recommendation of its regional director, it is likely that a third election will be ordered at the Thompson plants. Should the board press for the disestablishment of the independent unions at the plants, the case may be carried up to the Supreme Court.

## ASM Schedules 20 Group Meetings at Congress

A series of 20 group meetings on problems and operations confronting the metal industry will headline activities sponsored by the American Society for Metals during the twenty-sixth National Metal Congress and War Conference Display to be held in Public Hall, Cleveland, for five days beginning Oct. 16.

To be held each afternoon and evening except the evening of Oct. 19, these 20 special meetings will feature 153 discussion leaders dealing with such subjects as instruments for temperature control, inspection and gaging, and identification with various heat treating problems, the manufacture of steel and with gray iron castings, aluminum and titanium alloys, metal powders, metals for railroads, surface finishes, corrosion and surface peening.

Robert Crooks Stanley, chairman and president, International Nickel Co. of Canada Ltd., will receive the ASM Medal for the Advancement of Research during the annual dinner of the American Society for Metals on the evening of Oct. 19.

## MEETINGS . . . . .

*Important business, technical, and trade conventions of interest to metalworking and metal producing industries*

**American Management Association:** Conference on "Preparing for Manpower Reconversion." Hotel Pennsylvania, New York, Sept. 27-29.

**National Tool and Die Manufacturers Association:** First convention, Statler hotel, Buffalo, Sept. 28-30.

**American Institute of Mining and Metallurgical Engineers:** Electric furnace steel conference, Pittsburgh, Oct. 5-6.

**Society of Automotive Engineers:** National aircraft engineering and production meeting and engineering display, Hotel Biltmore, Los Angeles, Oct. 5-7.

**Eastern States Blast Furnace and Coke Oven Association and the Blast Furnace and Coke Oven Association of the Chicago District:** Bi-annual joint meeting, Del Prado hotel, Chicago, Oct. 6.

**Gray Iron Founders' Society Inc.:** Annual meeting, Netherlands-Plaza hotel, Cincinnati, Oct. 10-11.

**Electrochemical Society Inc.:** Niagara-Buffalo meeting, Hotel Statler, Buffalo, Oct. 12-14.

**American Society of Tool Engineers:** Twelfth

semi-annual meeting, Hotel Syracuse, Syracuse N. Y., Oct. 12-14.

**Wire Association:** Annual convention, William Penn hotel, Pittsburgh, Oct. 16-19.

**National Metal Congress,** sponsored by American Society for Metals, Public Auditorium, Cleveland, Oct. 16-20.

**Iron and Steel Division and Institute of Metals Division, American Institute of Mining and Metallurgical Engineers:** Seventeenth annual meeting, Hotel Statler, Cleveland, Oct. 16-19.

**American Welding Society:** Annual meeting, Hotel Cleveland, Cleveland, Oct. 16-19.

**American Society for Metals:** Annual meeting, Statler and Hollenden hotels, Cleveland, Oct. 16-20.

**Society for Experimental Stress Analysis:** Semi-annual meeting, Cleveland, Oct. 17-20.

**American Industrial Radium and X-Ray Society:** Annual meeting, Cleveland, Oct. 18-20.

**Ohio Section Open Hearth Committee and Ohio Valley Section, American Institute of Mining and Metallurgical Engineers:** Annual meeting, Deshler-Wallick hotel, Columbus, O., Oct. 27-28.



# Foundry Hiring Is Facilitated

*Detroit area manpower commission eases restrictions to permit employment of needed workers at factory gates without necessity of obtaining USES referral*

**DETROIT** EMERGENCY action has been taken by the war manpower commission to ease a serious shortage of workers in foundries and forge shops of the Detroit area, it was announced last week by E. L. Cushman, district war manpower commission director.

Effective immediately, Mr. Cushman said, these industries are to be given additional labor priorities which will make it easier for them to acquire the

help they urgently need for the continued production of war materials, and at the same time enable the worker to obtain foundry employment without certain of the complicated procedures formerly necessary.

Under the emergency order, which Mr. Cushman emphasized is only temporary, approved plants may hire employes who have secured their releases from other industries at the factory gate, without the necessity of the worker's

going through the United States Employment Office for a referral.

Under this order, cutting away red tape and broadening production and employment opportunity, the foundry or forge man may choose his own shop, providing it is one of the approved plants.

After securing his release from his former employer, he can simply walk up to the employment gate of the shop in which he wants to work, perhaps one in which he has had previous experience, and be hired.

At the same time, Mr. Cushman pointed out, seniority in their old jobs will be insured.

"The priorities convey authorization by which men may secure temporary leaves of absence from less essential employment to fill urgent jobs in these foundries and forge shops while maintaining seniority in their old jobs."

"I definitely feel that the gravity of the forge and foundry manpower shortage, which is seriously retarding war production in the Detroit area, justifies the action we are taking," Mr. Cushman declared. "Key members of my staff concur in that belief.

"It should be understood that this action involves only a temporary suspension of restrictions, both as to gate hiring privileges and employment ceilings. It is likely these restrictions will be reimposed after the present crisis is met."

## Foundry Wage Ceilings Raised in Two Districts

New stabilized foundry wage rates in two labor market areas have been established by the sixth regional WLB, Chicago, in its first action to break the war production bottleneck in the foundry industry. The new rates will permit appreciable pay increases to workers, according to Edgar L. Warren, chairman.

In the Racine-Kenosha, Wis., area, described as a hot spot in the foundry situation, the board brought the common labor rate from 70 cents an hour up to 80 cents, the existing stabilized common labor rate in the metal trades industry. The 10-cent increase was tapered to 5 cents in the higher classifications.

In the Springfield-Decatur, Ill., area, increases ranged from 2 cents to 25 cents an hour in various classifications. In the old stabilized rates, the starting rate for common labor was 55 cents an hour, with 60 cents after 30 days and 65 cents after 90 days.

Although the rulings are interpreted as cracking the Little Steel formula, Mr. Warren explained:

"These changes in stabilized rates do not mean that foundries in these areas automatically may increase their rates up to these levels. They mean that the WLB usually will approve applications up to these rates in voluntary cases and will take them into consideration in deciding dispute cases."

## POSTWAR PRELUDES

**INFLATION**—Threat of inflation shown to be most dangerous in postwar period. Industrialists convinced runaway price rise threat will increase rather than diminish when peace comes. See page 43.

**RECONVERSION**—Increasing signs of easing in war steel demand cause steel producers to sound out customers on prospective civilian steel needs in anticipation of quick switch from war production. See page 46.

**POSTWAR BUSINESS**—Heavy railroad demand in prospect when peace is restored in Europe as rehabilitation work gets under way. French inquiring for cars, locomotives, etc. See page 49.

**DEMOBILIZATION**—Bill passed by Congress and sent to President covers disposal of surplus war materials. See page 52.

**CONTRACT TERMINATION**—Ninety-four per cent of claims in Pittsburgh area settled. Early filing of inventories advised. See page 56.

**ALLOYS**—Lag expected in tungsten requirements when European war ends. Considerable falling off in tool steel demand seen while excess stocks are being absorbed. See page 57.

**BUSINESS CONTROL**—Maury Maverick, chairman, Smaller War Plants Corp., asserts government control of business must continue if a capitalistic form of economy is to be maintained in postwar era. See page 58.

**WAR AGENCIES**—President Roosevelt orders plans be prepared for discontinuing numerous war agencies. See page 60.

**WAGES**—Ford plan to advance wages may be more designed to ease blow to workers' take-home pay when hours are cut after the war. See page 63.

**GYROSTABILIZER**—Designed to permit accurate fire from moving tanks, gyrostabilizers promise floating rides in high speed trains, automobiles, and other vehicles. See page 78.

**OPPOSED-PISTON DIESELS**—Compactness, simplicity, economy and durability of opposed-piston diesel engines are proven in severe military usage. Now adaptable to many mobile and fixed installations. See page 83.

**MAGNETIC SEPARATION**—Now used on slightly magnetic materials in a variety of handling systems, new techniques for magnetic separation increase industrial applications, especially possibilities for inclusion in production lines. See page 95.

**WESTERN STEEL INDUSTRY**—Analysis of economic trends and relation of war expansion in western steel to raw materials, markets, and equipment brings forecast of new industrial patterns. See page 100.



# Senate Passes Surplus Property Bill With Three-Man Board Plan

*Surplus Property Administrator Clayton expressed disapproval to board plan legislation in letter to James F. Byrnes. Legislators also accept reports on measures to establish Office of War Mobilization and Reconversion*

**WASHINGTON**

SENATE last week passed and sent to the White House a surplus property bill setting up a board of three \$12,000-a-year members who shall have the power to choose disposal agencies for sale of specific types of goods and took another major step toward postwar adjustment by accepting the reports of its conferees on measures to establish an Office of War Mobilization and Reconversion.

Defeated in the reconversion bill were provisions granting \$200 transportation expenses for war workers back to their homes and the provision on unemployment compensation for civilian employes of the federal government. Under the approved reconversion measure, the nation's economy will be directed from war production to peacetime production by a single administrator, nominated by the President and confirmed by the Senate for a period of two years at a salary of \$15,000. Both the Office of Contract Settlement and the newly created Surplus Property Administration will fall under the reconversion administrator's authority.

Provision that the sale of surplus war property be applied to the national debt was eliminated in the finally approved surplus property bill.

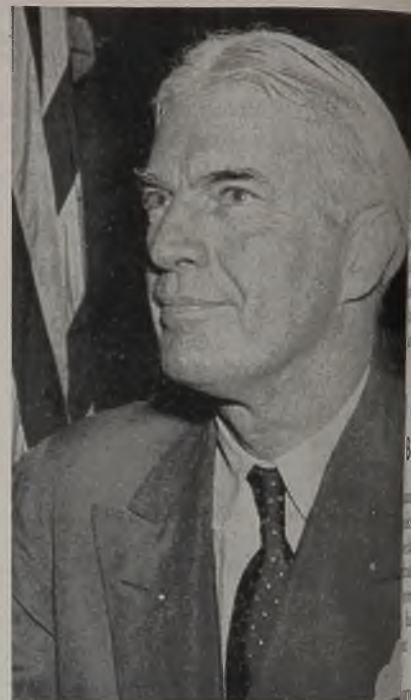
Despite the opposition of W. L. Clayton, surplus property administrator by presidential order, to legislation which "will not permit the surplus property program to be conducted in a business-like manner," the legislators approved a bill containing a board plan. Sen. Arthur Vandenberg (Rep., Mich.) interpreted the Senate's action as equivalent to a lack of confidence in Mr. Clayton.

Mr. Clayton revealed his position regarding surplus property legislation in a letter to James F. Byrnes, director of War Mobilization. The letter was placed in the hands of the Senate and House conference committee on the surplus property disposal bill as they voted to scrap a plan for a dual administration of the disposal of surpluses by a single executive, who would be directed in matters of policy by a four-man board.

Mr. Clayton, who favors administration of surplus property by a single executive as suggested in the Baruch-Hancock report, was provoked into submitting his letter of dissatisfaction with the legislation by the conference committee's decision not to place the final authority in the hands of a single administrator.

Mr. Clayton said that one man rule was not the issue but that administrative workability was the point. He declared that he had suggested to the surplus property disposal conferees that all regulations and all single sales of any property which cost the government \$1 million or more should be subject to the approval of the Policy Board (consisting of government officials like the present board functioning under Executive Order 9425).

Sen. Alben W. Barkley (Dem., Ky.) said that his hope was that Mr. Clayton would continue as surplus property administrator.



W. L. CLAYTON

## Union Objection Blocks Plan To Import Foreign Foundry Labor

*McNutt tells Senate investigating committee it would be simple matter to import Mexicans, Jamaicans and Barbadians to meet deficiency if organized labor would give approval. Total shortage in war plants now estimated at 200,000 workers*

IF IT were not for objections by organized labor, the foundry labor shortage could be very quickly relieved by bringing in foreign labor to serve for "the duration" War Manpower Commissioner Paul V. McNutt admitted recently in answer to questions put to him by members of the Senate war investigating committee. Whereas it was reported a few weeks ago that the foundries were short by some 20,000 workers, said Mr. McNutt, careful checks since then reveal the shortage to be in the neighborhood of 12,000. It would be a simple matter, he said, to bring in enough Mexicans, Jamaicans and Barbadians to meet this deficiency.

**Seeks Wage Increase**

"I suppose it is a fundamental objection on the part of labor—their feeling that by refusing to go along it will be possible thereby to put on pressure to get the wage scale up," said Mr. McNutt in answer to questions as to why the unions object to use of foreign labor as a temporary stopgap.

Mr. McNutt said there are some extenuating circumstances. "The theory has been," he said, "there is enough labor in this country if the wage scales were

raised, but at the present wage scale we have exhausted all our resources canvassing the country to get sufficient men to man these foundries."

The WMC more than a year ago, Mr. McNutt said, had recommended the wage increases be granted to foundry labor but there has been no action by the National War Labor Board. The latter agency has to think of all factors in shaping its policies, said Mr. McNutt. For instance, a general increase in foundry wages would have an effect on a foundry's postwar competitive position.

Suggestions have been made to the armed services that they relieve the situation by discharging expert foundry workers on condition the latter take jobs in that industry but so far there has been no result, said Mr. McNutt. There might be some relief from this source, it was hinted, since the armed services already have furloughed trained rubber workers back into the rubber industry. Otherwise it was indicated in the testimony, the labor shortage in the foundry industry is not due for relief until such time as the collapse of Germany results in contract terminations and cutbacks on wholesale scale.

The total labor shortage in war plants



## Armed Services Outline Cutbacks Which Will Follow Nazis' Defeat

*Ground forces will reduce purchases by 50 per cent. Landing craft program will be curtailed sharply. Naval procurement will be sustained. Maritime commission will complete all vessels for which keels have been laid, then end Liberty ship construction*

CHANGES in the war production program slated to go into effect immediately after V-E Day (Victory in Europe Day) were indicated last week as follows:

Purchases by the ground forces should be reduced some 50 per cent by volume as compared with the previous estimate of 40 per cent. Principal pressure will be for heavy-duty trucks, heavy prime movers, heavy caliber guns, heavy gun ammunition and heavy bombs. Additional cutbacks will be made in production of small arms and small arms ammunition.

The landing craft program, already sharply curtailed, will be curtailed further.

Air construction work will be sharply reduced, with resultant lightening of the demand for fabricated building steel now being supplied to the Corps of Engineers. There will be a continued heavy demand for steel for bridge construction. Demand for sheet piling will continue heavy.

Tonnage output of aircraft will be reduced some 20 per cent. Purchases of aircraft engines will be cut sharply, principally for the reason that production of engines of late has gone ahead of aircraft. There will continue to be a huge demand after V-E Day for long-range bombers and long-range fighter planes, especially heavy units.

The Air Forces will continue to buy landing mat steel in large quantities.

The Navy will take no backward steps of any kind. The full naval construction program will be carried to completion.

Maritime Commission will complete construction of all vessels whose keels have been laid by V-E Day. Thereafter the Liberty ship program will be terminated or curtailed sharply. The emphasis, in a volume still to be determined, then will be on producing Victory ships and other ships useful in the postwar era.

Freeing of shipbuilding facilities after V-E Day will permit large-scale repair and rehabilitation of both merchant and naval vessels. Due to pressure of new ship construction the repair and rehabilitation program has accumulated and will require large quantities of steel and other materials, also parts and machinery. These requirements will be on a much greater scale than hitherto anticipated.

Of the approximately 9,500,000 people now employed in munitions work (including direct work on munitions but not

in essential civilian war work as in operating the railroads, producing foods, etc.) about 3,000,000 should become available for other work immediately after V-E Day.

### Wire Placed on Army's Production Urgency List

Explaining the critical need for more wire, Major General H. C. Ingles, has notified wire manufacturers the War Production Board had placed field and assault wire on the production urgency list as one of the items on which increased production is vitally needed.

This action was taken because increased demands from the theaters of war made it imperative a greater supply be forthcoming immediately.

General Ingles said wire is a weapon of offense and the greater the offensives the greater the need for wire. "Many great soldiers," General Ingles continued, "have seen the fruits of victory taken from them because of the lack of communications, and many enemies have been permitted to fight another day because communications were inadequate."

### Two-Thirds of QM Contracts Awarded to Small Business

Quartermaster Corps contracts awarded to small business firms during the first six months of 1944 amounted to 73 per cent of the dollar value of all Quartermaster contracts.

Total purchases of the corps for the period amounted to \$2,755,435,186. Contracts involving \$1,988,023,000 of this amount went to small businesses. Total number of prime contracts for the same period was 364,505, of which 48,687, or 13.3 per cent, were awarded to small businesses.

Long before the Small Business act came into being, the procurement division of the Office of the Quartermaster General adopted a policy of spreading contracts among the smaller firms.

A total of 14,985 prime contracts, or 30 per cent of the contracts to small business, went to firms employing fewer than 100 employes, while 17,264, or 35.4 per cent, were awarded to firms employing 100 to 500. The remainder, 16,438 contracts, was awarded to firms employing 500 or more, but still of such limitations as to be classed as small businesses.

now is in the neighborhood of 200,000 workers, said Mr. McNutt. This figure may not be entirely accurate but it is the figure set by the armed services and, as such, the figure to which the WMC is working. Production of the following military material is affected by this labor shortage, said Mr. McNutt:

Tanks, high tenacity tire cords, aviation gasoline, naval shore establishments, steel plate, heavy artillery, artillery ammunition, tentage duck, ship repairs, lumber, castings, heavy duty tires, heavy and medium trucks, heavy bombs.

### 3550 Damaged Tanks Will Be Reclaimed

Remanufacture of thousands of damaged tanks is the major feature of a large scale reclamation program under which the Ordnance Department of Army Service Forces expects to return to active duty a high proportion of equipment worn out or damaged in battle or in training.

Tank production, once cut back, is now high on the priority list both because of losses in France and because the open terrain of the new battlefields permits greater use of armor.

The Ordnance Department is planning the remanufacture of approximately 3000 M-4 General Sherman medium tanks and 550 M-5 light tanks before January. These 3550 tanks will be in addition to the tanks produced under the increased production schedules. All recent modifications will be incorporated.

Rebuilding operations are being carried out by International Harvester Corp., Chrysler Corp., American Locomotive Co., and American Car & Foundry Co., as well as Ordnance depots at Chester, Pa.; Rock Island, Ill.; Lima, O.; Richmond, Calif.; Benicia Arsenal, Calif.; Tooele, Utah; Anniston, Ala.; and Watervliet Arsenal, New York.

### German Surrender Will Not Affect Shipbuilding Plans

United States Maritime Commission does not plan to cut back its shipbuilding program when Germany surrenders because the Pacific war is largely a naval operation, Rear Admiral Howard L. Vickery, vice chairman, Maritime Commission, said last week at a press conference in Cleveland where he presented the Maritime "M" pennant to the Reliance Electric & Engineering Co.

For the present, cutbacks amount to about 3 per cent. Any further cutbacks, he said, depend on the success of the war against Japan. Maritime Commission has under contract or already built 55,000,000 deadweight tons and currently only 160 Liberty ships are being canceled from the present shipbuilding program.

Reliance Electric, besides being awarded the Maritime "M" pennant, was granted the Victory fleet flag and Maritime badges for its employees.

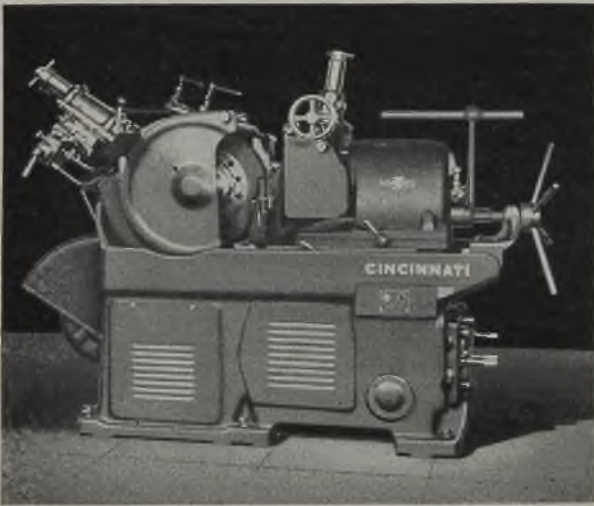


DIAMETER AND SHOULDER

**GROUND  
IN ONE OPERATION**

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**CENTERLESS METHOD**



*CINCINNATI No. 2 Centerless Grinding Machine. Specification catalog G-456-1 contains complete details. Sweet's Catalog File for Mechanical Industries gives a brief description.*

In the illustration on the opposite page CINCINNATI No. 2 Centerless is grinding, simultaneously, the outside diameter and the face of an adjacent flange of a casing assembly. To handle the operation, the regulating wheel is set at a slight negative angle. This setting tends to move the work to the front of the machine, but the end stop permits it to advance just far enough to grind the face of the shoulder. Thus the diameter and shoulder are ground in one operation by the economical centerless method. The extra equipment included Roller Infeed Work Rest with special End Stop and Guides for loading the work, as well as Bar and Sleeve for truing the side of the wheel. ¶ This type of set up, a development of the Application Engineer here at Grinding Headquarters, has worked out very satisfactorily for a variety of parts. Our engineers will be glad to talk with you about various methods of handling your centerless or center type grinding operations to better advantage.



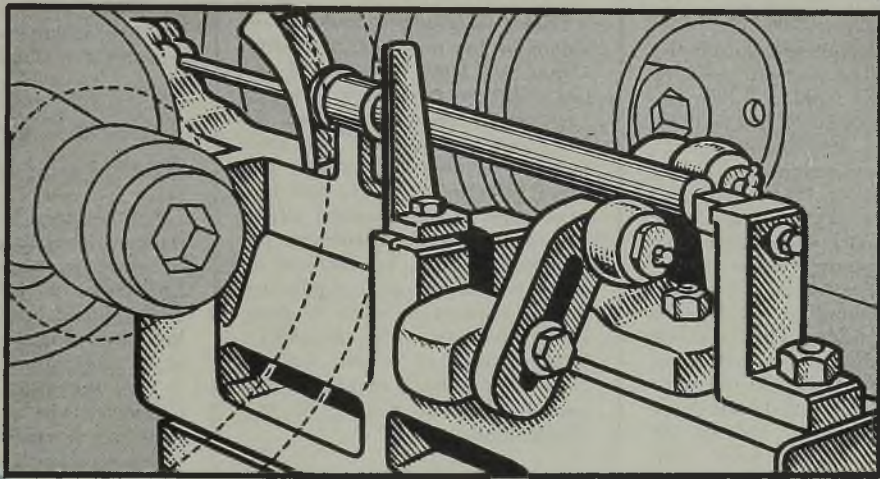
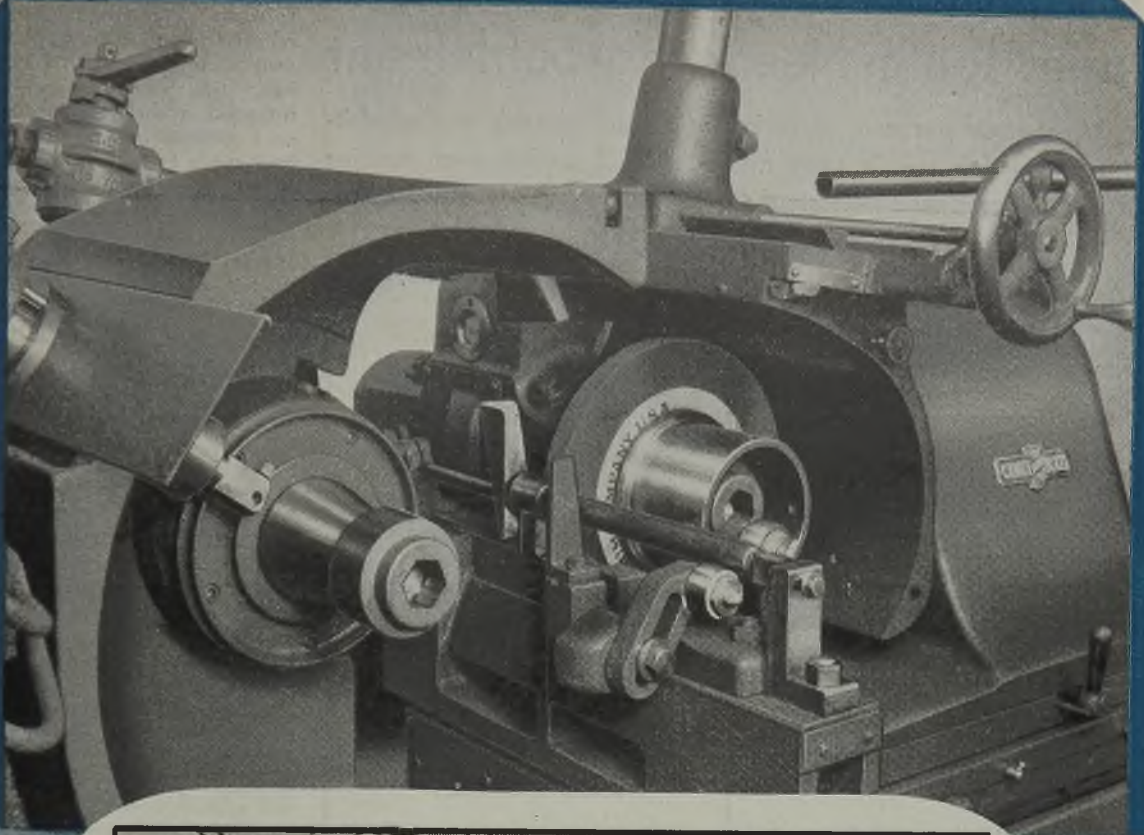
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**WAR BONDS**

CINCINNATI

CENTER TYPE GRINDING MACHIN

STEEL





*In the photograph above the wheel has been removed to show the setup more clearly. The machine is a CINCINNATI No. 2 Centerless. The sketch illustrates the special equipment and how the various elements of the setup function.*

# CINCINNATI GRINDERS INCORPORATED

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CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES



# Pittsburgh Ordnance Finds Only Three Months Needed for Settlement

*Ninety-four per cent of claims in district already settled. District officials say industry has working knowledge of policies and procedures established for settlements. Early filing of inventories advised*

WAR contracts that are terminated after the defeat of Germany can be settled within three months, provided industry co-operates, according to the Pittsburgh Ordnance District.

Pittsburgh ordnance officials say that as of Aug. 31, 435 prime contracts were canceled, totaling \$250 million, of which 412 have been completely settled, leaving 23 unsettled contracts, none of which had been outstanding more than six months.

The 412 settled contracts included several hundred subcontractors' claims. On the average, settlements were made on the basis of 83 per cent of the claims originally filed before disposal credits. Credits for the disposal of property in connection with the claims amounted to 10 per cent, making a net settlement, on the average, of 73 per cent of the original claim.

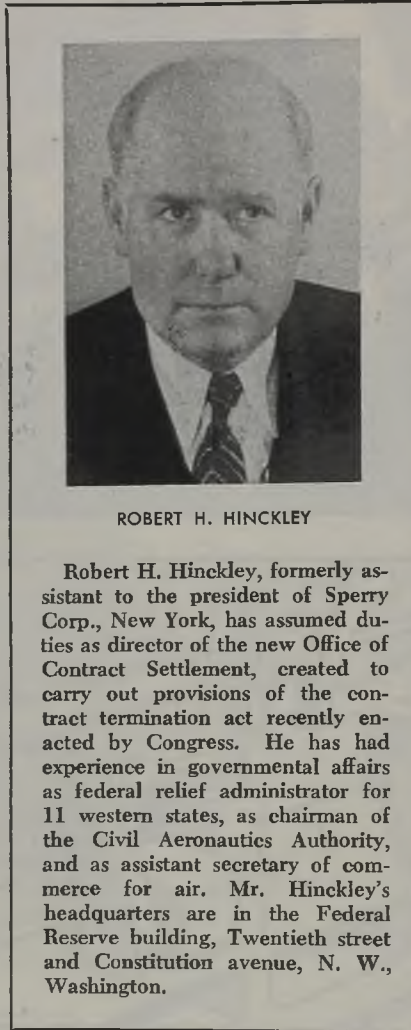
### Has Workable Knowledge

"The results accomplished during the past three months in the settlement of claims," say district ordnance officials, "demonstrates that industry in the Pittsburgh district has a workable knowledge of the policies and procedures established for the settlement of terminated contracts. The apathy that existed a year ago in reaching quick final settlements has gradually disappeared; today, industry is definitely interested in prompt settlements, and procedures are being set up to process claims quickly. There is much left to be done, of course, in setting up adequate procedures to handle the large number of cancellations that will come on the defeat of Germany, but, on the whole, progressive plans have been established by contractors with the ordnance department."

Experience in the district shows disposal of property is a major cause for delay in reaching quick final settlements. The time lag between the date of termination and the submission of inventories of raw materials, work in process, etc., has been the principal bottleneck. Also, the submission of incomplete or inaccurate inventories has resulted in much delay and unnecessary additional work.

"In our opinion," district officials say, "the submission of accurate inventories, based on physical count or weight, within 30 days after the termination of a contract is essential to prompt settlements. An accurate inventory will serve to protect the interests of contractors and also the interests of the government, and will result in more expeditious settlements."

During the period from Jan. 1 to Aug.



ROBERT H. HINCKLEY

Robert H. Hinckley, formerly assistant to the president of Sperry Corp., New York, has assumed duties as director of the new Office of Contract Settlement, created to carry out provisions of the contract termination act recently enacted by Congress. He has had experience in governmental affairs as federal relief administrator for 11 western states, as chairman of the Civil Aeronautics Authority, and as assistant secretary of commerce for air. Mr. Hinckley's headquarters are in the Federal Reserve building, Twentieth street and Constitution avenue, N. W., Washington.

31, 1944, \$6.5 million worth of property has been disposed of in connection with the termination settlements. Approximately \$1.5 million of this property has been transferred to the government at full price for use in the ordnance program. The remaining \$5 million worth of property consisted of raw materials, work in process, finished parts, jigs, dies, fixtures, tooling, etc. On the average, raw materials were disposed of at 65 per cent of cost. Work in process and finished parts have been disposed of at 80 per cent, on the average, of the original cost. On special equipment, such as jigs, dies, fixtures, and tooling, the amount realized has averaged 15 per cent to 30 per cent of cost.

"It must be recognized, of course, that a large volume of the work in proc-

ess, as well as special equipment, such as jigs, dies, and tooling, has a value only as scrap. For example, on \$1.5 million of work in process scrapped, only 6 per cent of cost was realized. Cutting tools, jigs, dies and fixtures which were scrapped, realized approximately 1 per cent of cost. A determined effort has been made to find other uses for property, to turn over to the government only that which could not be disposed of or should not be scrapped. Where there has been no foreseeable use for work in process or other property, it has been scrapped and returned to the steel mills, etc."

## Industrial Gas Meeting Scheduled for Oct. 18

The Annual Industrial Gas breakfast and meeting at the National Metal Congress will be held by the Industrial and Commercial Gas Section of the American Gas Association at Hollenden Hotel, Cleveland, on Wednesday, Oct. 18, at 8:30 a.m. All gas men and equipment manufacturers who will be at the National Metal Congress are invited to attend.

A valuable program that will extend through the morning has been arranged. Outstanding heat treaters and others will take part in this program. The meeting will adjourn in time to allow for attendance that day at the National Metal Exposition where leading industrial gas equipment manufacturers will have displays.

## Expects Civilian Output at 1941 Level When Nazis Fall

"If the cutback in military goods production, immediately after the defeat of Germany, is as much as 40 per cent, it has been officially predicted, Crosley Corp. should be able to resume production of its peacetime products on the basis of its 1941 volume."

This statement was made by R. C. Cosgrove, vice president and general manager, manufacturing division, Crosley Corp., Cincinnati, to a large group of distributors from all parts of the country attending its sales conference in Cincinnati.

This was the first of a series of three similar conferences of Crosley distributors at the Cincinnati headquarters of the company and was the first nation-wide Crosley distributor conference to be held since America entered the war.

## Remington Rand Plant Plans For Speedy Reconversion

Reconversion will be relatively simple for the Tonawanda, N. Y., plant of Remington Rand Inc., once devoted to the making of steel filing equipment but now turning out stabilizers for cargo planes and rudders for fighters. The company will go back to the making of steel cabinets and filing equipment.



# Lag in Tungsten Expected When Nazi War Ends

*Considerable falling off in tool steel demand seen while excess war stocks are being absorbed*

NEW YORK

WITH practically 75 per cent of all tungsten going into the steel industry, a pronounced lessening in demand is expected to be felt once peace is declared in Europe. This is ascribed not only to the fact that steel production may within two or three months decline 30 to 40 per cent, but to the fact that there may be a considerable lag in tool steel buying while excess war stocks are being absorbed.

Few in the trade look for tungsten to maintain anywhere near its wartime levels for some time to come.

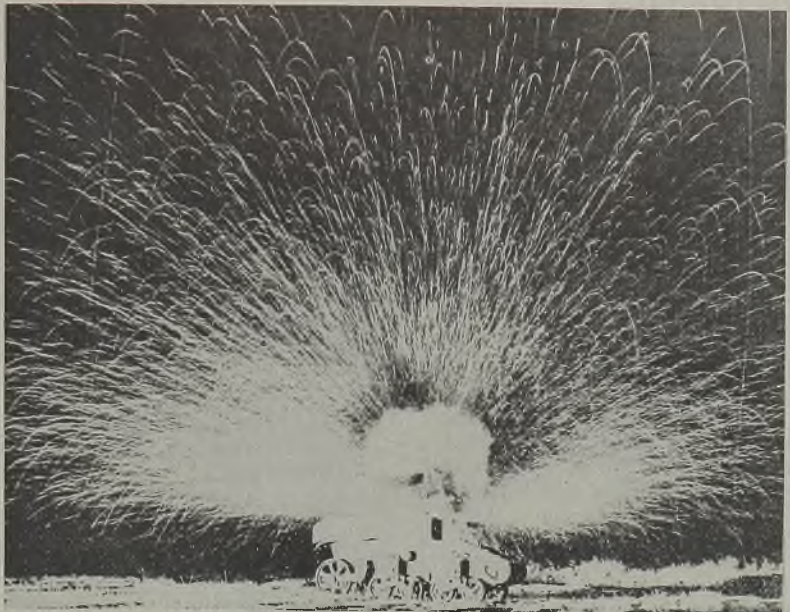
At the same time, however, certain tungsten applications are growing. Notable has been growth in the use of tungsten carbide for tipping tools, oil well drills and scrapers. This general application has developed rapidly during the war and is expected to continue to develop.

Also there is now a very decided swing back to the use of 18-4-1 tool steel. Early in the emergency when tungsten was very scarce, molybdenum was brought into greater use for tool steel so as to conserve tungsten. Molybdenum is going to retain certain of its gains in this field, especially in the so-called 6-6 tool steel, but molybdenum tool steels have to be specially heat treated and many of the smaller users have not the facilities for doing this. Hence, they in particular are now showing livelier interest in 18-4-1 tungsten tool steel.

Broadly speaking, about 65 per cent of all the tungsten goes into ferrotungsten, 10 per cent into tungsten concentrates and 25 per cent into miscellaneous uses, including carbides, lamp filaments, and so forth.

Interestingly, this country will be in somewhat better position to supply its tungsten requirements than before the war. Many of the high cost producers have already disappeared from the scene, but there are still certain properties, notably the Yellow Pine deposits in Idaho, the Mill City mines in Nevada and the Creech Creek property in California, which are likely to continue on, and they in the aggregate represent an increase. The Yellow Pine property, which came into operation early in the emergency, is said to be in fact, the largest tungsten mine in the world.

Some trade leaders believe that this country after the war will be in position



**DEADLY PYROTECHNICS:** This spectacular picture was made when a bazooka was fired at a tank. A single high explosive rocket sends this shower of molten metal into the night and makes a three inch hole in the tank's armor. NEA photo

to supply most of its needs so far as quantity is concerned, but whether it does or not will depend much on the price of foreign ore, although certain consumers require wolframite, which is brought in from abroad (practically all of the tungsten produced in this country is scheelite). In prewar days consumers bought the major portion of their tungsten requirements abroad.

Molybdenum demand will not reach war levels for at least a considerable time to come, but even in the following few years after the end of hostilities, it is expected to be heavier than before the war. During the war it has been used extensively as a substitute for tungsten in tool steel, as indicated, and also as a substitute for nickel in alloy steels, and it will probably retain some of its gains. While many steel companies now use slightly less of this alloy than was formerly thought necessary, it, nevertheless, is growing in general use.

Approximately 90 per cent molybdenum is used as molybdic oxide with the remainder largely in the form of ferromolybdenum.

## Weirton Steel's Hot Mill Sets New Record

For the second time this year, a new monthly production record has been set on the Weirton Steel Co.'s 48-inch continuous hot mill, Weirton, W. Va., which was the first completely continuous mill to be placed in operation anywhere in the world.

Production on the mill in August was 95,775 tons, compared with the previous

record of 93,453 tons which was set in March, 1944. Prior to this year the mill's record production was 92,978 tons in March, 1942.

According to Weirton officials, the August tonnage of the 48-inch mill represents more than three times the capacity for which the mill was originally designed although no changes have been made in the basic structure of the mill since it was installed.

## Steel Distributors To Meet At New York on Oct. 3

Steel Distributors Institute Inc., New York, will hold its third forum devoted to current problems of steel dealers in the Hotel Commodore, New York, Tuesday, Oct. 3, at 10:30 a.m.

Government officials will speak on how and where to obtain steel surpluses, the exporting of surpluses and the policies and procedure of government contract termination.

## Demand for Tracklaying Tractors Remains High

Military demand for tracklaying tractors will remain high in 1945, even if European hostilities cease, the War Production Board said last week. Combined estimated military and civilian demand for 1945 still exceeds the industry's total production capacity. From present indications, none of the heaviest type tractors and very few of the lighter types will be available for general contractor use.



# Maverick Favors Postwar Control Of Business

*SWPC chairman says government control necessary if capitalistic form of economy is to be maintained*

ASSERTING that government control of business must continue if a capitalistic form of economy is to be maintained, Maury Maverick, chairman, Smaller War Plants Corp., in New York recently presented 10 principles which should be followed during reconversion.

The program, he pointed out, calls for the wiping out of cartels and monopolies, full speed in the matter of contract terminations, and the prompt establishment of policies in regard to the disposal of surplus properties.

Also, it calls for adequate interim financing which would encourage venture capital, a system of technical advisory assistance which would match that given by the Department of Agriculture for farmers, aid to veterans in establishing new businesses, and reasonable unemployment compensation to overcome any threats of a widespread unemployment period.

Mr. Maverick declared that a policy of

leaving business completely alone during the reconversion period would mean "the destruction of all competitive business as we know it." He believes that the continuance of the Smaller War Plants Corp., or a similar agency, for at least two years after the war, would be necessary if small business is to provide the support necessary for "big business."

Relative to the question of business failures, the speaker declared that the nation must not only enjoy a return of the 500,000 business concerns which have gone out of business during the war, but also must have a net gain of 1,000,000 new concerns if it is to have prosperity.

He spoke at a luncheon meeting of more than 100 district and regional managers of the Research Institute of America, which opened a three-day conference in the Waldorf Astoria hotel.

## Northeastern Ohio Seen As Ideal Industrial Location

Cleveland and northeastern Ohio's advantages as a section for metal industries to locate facilities have been compiled in a new 16-page booklet, "The Best Location in the Nation," just issued by the Industrial Development division, Cleveland Electric Illuminating Co., Cleveland.

It covers such important phases as available plants and plant sites, transportation facilities, manpower, raw materials, parts, supplies, banking facilities, and other important services.

The booklet points out that the central location of Cleveland saves industry time and money on shipments to and from the factory. Central location permits closer supervision of markets as well as branches and warehouses.

The northeastern Ohio section, according to the booklet, is capable of supplying most industry's requirements such materials as iron, steel, aluminum, copper, brass, manganese, lumber, rubber, chemicals, etc.

## New Metal Cleaning Equipment Company Formed

Optimus Equipment Co., Matawan, N. J., has been organized to design and manufacture equipment for metal washing, rinsing, pickling, tumbling and drying operations. While rendering an engineering service in connection with the building of specific types of equipment for special sequences of operations, the company will also introduce a number of standard models for general metal washing use in production, maintenance and repair work. Optimus Equipment Co. will function in close affiliation with the Hanson-Van Winkle-Munning Co., Matawan, N. J.

## Mitchell Mfg. Co. Acquires West Coast Lighting Plant

Mitchell Mfg. Co., Chicago, maker of fluorescent and other lighting equipment, recently announced consolidation with the Tru-Ad Co., Los Angeles. In the future this Los Angeles factory will operate under the name of Mitchell Mfg. Co., Ad division, Los Angeles.

## A. S. Campbell Co. Buys Hunt-Spiller Mfg. Corp.

A. S. Campbell Co. Inc., East Boston, Mass., has taken control of the Hunt Spiller Mfg. Corp., South Boston, Mass. for 134 years engaged in the production of castings for the United States and builder of the first rifled cast iron gun in this country.

Neil C. Raymond, president, Campbell company, becomes head of Hunt-Spiller succeeding V. W. Ellett, for 33 years president. Frances W. Wheller, vice president, Campbell company, becomes vice president of Hunt-Spiller.

## Lukens Steel Licensed To Manufacture "Cor-Ten"

Carnegie-Illinois Steel Corp., Pittsburgh, U. S. Steel subsidiary, announced last week that Lukens Steel Co. has been licensed to manufacture "Cor-Ten" corrosion-resisting, high strength low-alloy steel, developed by Carnegie-Illinois "Cor-Ten" has heretofore been produced solely by subsidiaries of U. S. Steel Corp.



WINNERS: Awards of \$4750 were made to employees of the Lincoln Electric Co., Cleveland, for ideas on postwar planning. Photo shows J. F. Lincoln, president, presenting checks to four of the 15 prize winners. Left to right, the employes are: R. Blair, \$100; D. J. Burke, \$600; Jim Nicholl, \$1000; and L. Bunasky, \$250





**REPAIRS FOR NAZIS:** In this bombed hangar near Paris are shown Allied planes from which the Nazis were obtaining spare parts before the airfield was captured. NEA photo

Holbrook & Henderson Inc., New York, as exclusive representatives in the New England territory.

General Electric Co., Schenectady, N. Y., has purchased a 155-acre plot at Liverpool, N. Y., where a new plant will be built as headquarters for its Electronics Department.

Goodyear Tire & Rubber Co., Akron, O., plans to build a plant at Topeka, Kans., where large dimension tires for military use will be manufactured. The new factory, a DPC unit, will be completed about Jan. 1, 1945, and will employ about 400 persons.

Tube Turns Inc., Louisville, Ky., has published a 20-page booklet giving allowable working pressures for welding fittings in five classes of piping—power, oil, district heating, gas and air, and refrigeration.

Sales Engineering Associates Inc., Los Angeles, has been appointed sales agent by the Laminated Shim Co.'s An-cor-lox Division to cover the Southern California area.

Product Designers, Chicago, is the name of a new organization of industrial designers and engineers recently formed in Chicago with offices at 230 North Michigan avenue.

Carnegie-Illinois Steel Corp., Pittsburgh, announces its Wood works has produced steel for 626 days without a lost time accident.

Bertell-Sheffield Co., New York, designer and builder of industrial and educational exhibits and displays, has been formed by Roy C. Bertell and William H. Sheffield, formerly vice presidents of the Ivel Corp.

American Association of Engineers, Chicago, contends that 500,000 technologists seem likely to be amalgamated in a "labor front" as they were in Germany if the trend initiated by the Wagner Labor Relations act continues unmodified. This is brought out in a book entitled, *Technologists' Stake in the Wagner Act*.

**AWARDS . . .**

- J. G. Brill Co., Philadelphia, adds white star.
- Jenkins Bros., Bridgeport, Conn., receives fourth gold star.
- Brownsville Shipbuilding Corp., Brownsville, Tex.
- Corinth Machinery Co., Corinth, Miss.
- Eaton Mfg. Co., Wilcox-Rich Division, plants at Battle Creek and Marshall, Mich.
- George E. Failing Supply Co., Enid, Okla.
- North American Aviation Inc., Kansas City, Kans.
- Ventnor Boat Works Inc., Pleasantville, N. J.
- Rheem Mfg. Co., Chicago.
- Reliance Electric & Engineering Co., Cleveland, receives "M" pennant.
- Western Gear Works, Seattle, adds third star.
- Skinner Purifiers Inc., Detroit.

**BRIEFS . . . .**

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

Wilkening Mfg. Co., manufacturers of piston rings, Philadelphia, reports that three captains from the China Air Force have been in training at its plant and will become acquainted with the production of piston rings.

Westinghouse Electric & Mfg. Co., Pittsburgh, has prepared a ten-part training course covered by sound slide films, lesson books, quiz books, and an instructor's manual on the basic principles and applications of electronics in the industry.

Weatherhead Co., Cleveland, has opened an office in the Pure Oil building, Chicago, to more conveniently serve the Midwest.

Crosley Corp., Cincinnati, announces the Miami Valley Distributing Co., Dayton, O., has been appointed distributor for the southwestern part of Ohio.

Charles Dreifus Co., Philadelphia, has moved its New York district offices from 230 Morgan avenue, Brooklyn, to Broadway, New York.

Prosperity Co., Syracuse, N. Y., has acquired space three times the size of present facilities through purchase of land and buildings formerly owned by the Pierce Butler Radiator Corp.

Whiting Stoker Co., Whiting, Ind., manufacturer of stokers, has been acquired by the Lingerwood Mfg. Co.,

Elizabeth, N. J. Head offices will be maintained in Chicago and Whiting Stoker will be operated as an affiliate of the Lingerwood company.

Ohio State University, Columbus, O., announces that all papers submitted in the James F. Lincoln Welding Foundation's award and scholarship program of 1942-43 have been placed in the university's welding library.

Barco Scraping Co., Cleveland, has published a pamphlet regarding its surface plates, angle irons, and straight edges made of Meehanite.

Tungsten Alloy Mfg. Co., Newark, N. J., has issued a new catalog containing illustrations, diagrams, and specifications for its carbide tipped cutting tools, tool blanks and lathe and grinding centers.

National Carbon Co., New York, has initiated a new sales system under which all its products will be handled nationally from seven divisional offices. New headquarters will be opened Oct. 1 at New York, Pittsburgh and Chicago. Similar offices were established a few months ago at Atlanta, Ga., Dallas, Tex., Kansas City, Mo., and San Francisco.

Briggs Clarifier Co., Washington, announces addition of a new series of clarifiers to its line, known as ZR series.

George Gorton Machine Co., Racine, Wis., announces appointment of Russell,



# Plans for Demobilization of War Agencies Ordered by Roosevelt

*Budget Director Smith instructed to re-examine staffing and duties of all agencies and to prepare plans for liquidation of war agencies, reassignment of their continuing functions, reduction of government personnel to peacetime needs*

WASHINGTON  
BUREAU of the Budget has been ordered by President Roosevelt to begin planning demobilization of the government's vast wartime machinery through liquidation of emergency bureaus and agencies and reduction of the federal payroll to a "peace footing."

"Some steps along these lines may be taken when the fighting ends in Europe," Mr. Roosevelt wrote to Budget Director Harold D. Smith. "Most of the planning will probably have to wait for execution until the Japs have surrendered—and there is no way of telling when that will happen. But the plans should be ready."

The President ordered immediate re-examination of the staffing and duties of all agencies and said he wanted plans as soon as possible for:

"Liquidation of war agencies and the reassignment of such permanent or continuing functions as they possess.

"Reduction of government personnel to a peace footing.

"Simplification and adaptation of the administrative structure to peacetime requirements."

Federal payrolls were reported by the Civil Service Commission at 2,936,602 employes as of Sept. 1 and were estimated by the Byrd committee on government spending at 3,112,965 as of Sept. 13. Some officials have predicted that federal payrolls will approximate 1,500,000 for several years, even with closing of war agencies. About a million workers were on federal payrolls before the war.

This represents the first specific order for demobilization plans within the administration and the first definite indication that the liquidation of war agencies will be carried forward rapidly.

Many of the war agencies are expected to be completely dissolved soon after the war ends, although some undoubtedly will continue to carry on at least part of their present functions for an indefinite period ahead. In addition, services performed now by some war agencies and emergency bureaus will be continued under the direction of prewar governmental departments.

Some of the major war agencies, such as the Office of Price Administration and War Production Board are expected to continue operation for some time after hostilities cease. This is deemed necessary by many officials to assure economic stability. There is a possibility that some of the policies established

by the War Manpower Commission will be maintained under the Department of Labor.

Some war agencies are beginning to release workers under their own demobilization plans. The WPB, for instance, has abolished several smaller units, and the Office of Defense Transportation is eliminating about 1000 of its 5000 positions.

## Aircraft Output Schedules Undergo Further Revision

Shifting emphasis of the air war, as illustrated by growing needs for certain types of long range bombers, fighters and transports, has necessitated a further revision of future aircraft production schedules, the War Department has reported to the Production Executive Committee, WPB. Certain types of aircraft for which there is a diminishing demand are being cut back to lower

schedules in five plants to provide space, equipment and labor to be used in the manufacture of airplanes for which there is a growing need. In some cases the cutbacks extend as far into the future as December, 1945.

## General Electric To Expand Motor Output Facilities

Recognizing the need for increased capacity for fractional horsepower, alternating current motors to reduce the present backlog of unfilled orders, the Facilities Committee of the War Production Board has approved an expansion of facilities by the General Electric Co. to the extent of \$550,000 to be financed by the company, WPB said last week.

In line with current War Manpower Commission regulations, this operation being placed in a loose labor area, and in fact, is utilizing labor released from cutback in Navy equipment.

## Appointments-Resignations

John B. Campbell has been appointed deputy vice chairman for production of the War Production Board, succeeding William B. Murphy who has resigned to return to the Campbell Soup Co. Campbell, who is also chairman of the Automotive Production Committee at the National Forge and Foundry Committee, has been associated with WPB since April, 1942.

## Increased Use of Alloy Steel Scrap Ordered

*Monthly use of alloy steel scrap must be raised to 65 per cent by electric furnaces and to 52 per cent by open hearth furnaces. Requirements must be met on individual plant basis*

INCREASED mandatory consumption of alloy steel scrap in electric and open hearth furnaces producing certain grades of alloy steel is required in a revision of direction 4 to order M-21-a, issued by the War Production Board.

Stainless steels, tungsten tool steels, and high alloy heat-resisting valve steels used in internal combustion engines are still excluded from the direction, WPB said.

Electric furnace charges of alloy steel scrap over a monthly period are increased by the amendment, from 60 per cent to 65 per cent. However, the turnings to be included in the melts remain at 8 per cent of the monthly total.

For open hearth furnaces, the overall required use each month of alloy steel scrap has been raised from 50 per cent to 52 per cent. The required turnings consumption of these furnaces has been extended from 8 per cent to 11 per cent.

WPB officials, in offering an example, said that a plant which produces 10,000 tons monthly of electric furnace alloy

steel ingots must consume at least 65 tons of alloy steel scrap. This scrap must be added directly to the furnace charge, or through the use of pig iron. Of the alloy steel scrap consumed monthly by such a plant, at least 800 tons must have been alloy steel turnings.

These requirements must now be met on an individual plant basis, rather than an overall company basis, WPB officials emphasized.

The requirement for using definite percentages of alloy scrap in the manufacture of chromium steels has been eliminated. The direction will cover only the types of alloy steel containing nickel or molybdenum or a combination of both elements.

The steel industry has recommended that direction 4 be kept in force in order to conserve alloys and to reduce the contamination in carbon steel. If mandatory segregation of alloy scrap were eliminated, or if the consumption of this segregated material should be reduced, the contamination problem would be considerably increased, WPB said.



# PRIORITIES-ALLOCATIONS-PRICES

Weekly summaries of orders and regulations, together with official interpretations and directives issued by War Production Board and Office of Price Administration

## INSTRUCTIONS

**REJECTED OR EXCESS STEEL:** Steel distributors now may apply for permission to deliver any off-grade or rejected steel or idle or excess inventory which they have been unable to move from their stock, under the Controlled Materials Plan regulations. Deliveries may be made to any person who has an approved end-use, but who is not in a position to furnish a WP allotment number or symbol with his order.

Direction 3 to CMP regulation No. 4 provides: (1) Any person who has received an allotment of carbon steel may use that allotment to purchase alloy steel in the NE-9400 series from any distributor's stock, but this substitution may not be made when ordering from producer.

(2) Any steel distributor operating under order M-21-b-1 who has an inventory of alloy steel in the NE-9400 series on hand or in transit to his stock on Sept. 13 may offer and deliver, subject to the approval of his customer, any such steel on any order that he is permitted to fill under CMP regulation No. 4 which calls for the delivery of carbon steel. Any such delivery may be used by the distributor to support a stock replacement order for any general steel product in the manner authorized under order M-21-b-1.

**ALLOY STEEL SCRAP:** Increased mandatory consumption of alloy steel scrap in electric open hearth furnaces producing certain grades of alloy steel is required in a revision of direction 4 to order M-21-a. Stainless steels, tungsten tool steels, and high alloy heat-resisting steels used in internal combustion engines are still excluded from the direction.

Electric furnace charges of alloy steel scrap for a monthly period are increased from 60 per cent to 65 per cent, although the turnings included in melts remain at 8 per cent of the monthly total. For open hearth furnaces, the overall required use each month of alloy steel scrap has been raised from 50 per cent to 52 per cent. Required turnings consumption of these latter furnaces has been extended from 10 per cent to 11 per cent.

These requirements now must be met on an individual plant basis, rather than an overall company basis. Requirements for using definite percentages of alloy scrap in the manufacture of chromium steels has been eliminated. The direction now covers only the types of alloy steel containing nickel or molybdenum or a combination of both elements.

**CAST IRON BATHTUBS:** Production of 50,000 cast iron bathtubs during the fourth quarter of 1944 has been authorized for distribution to fill military orders, for export authorized by the Foreign Economic Administration, for installation in construction projects specifically authorized by WPB, or for petroleum operators approved by the Petroleum Administration for War. Each of the following producers has been authorized to produce 10,000 tubs: American Radiator & Standard Sanitary Corp., Louisville, Ky.; Crane Co., Chattanooga, Tenn.; Eljer Salem, O.; Kohler Co., Kohler, Wis.; and Raymond Radiator Co., Uniontown, Pa.

**MACHINERY AND EQUIPMENT:** Provisions of equipment subject to any WPB order listed in A of priorities regulation 24 must file in WPB-3940 monthly in accordance with the instructions on that form, showing the quantity of their rated and unrated shipments. However, if the dollar value of a producer's monthly shipments of unrated orders does not exceed 10 per cent of his total shipments, he need not file this report. List A contains those regulations having restrictions on the shipment or filing of unrated orders which are overridden by provisions of PR 24, issued

Aug. 28, 1944. They are: E-1-b (machine tools), E-9 (precision measuring instruments), E-11 (foundry equipment), L-89 (elevators and escalators), L-123 (general industrial equipment), L-193 (conveying machinery), L-221 (electric motors), L-226 (printing trades machinery), L-250 (electric motor controllers), L-268 (oxy-acetylene apparatus), L-287 (portable conveyors), L-298 (welding equipment), L-311 (logging and lumber machinery), L-314 (lubrication equipment), and L-332 (container machinery).

**CONSTRUCTION MACHINERY:** Special sales of new construction machinery items listed on list B of priorities regulation No. 13 must be authorized by the WPB through approval of applications made on form WPB-1319. List B

## INDEX OF ORDER REVISIONS

Subject	Designations
Chains, Tire	L-201
Copper	M-9-c
Escalators	L-89
Furniture, Metal	L-13-a
Hardware	L-236
Machinery, Food Processing	L-292
Shovels, Snow	L-157

### Price Regulations

Castings, Iron	Nos. 241, 244
Consumer Goods	No. 188

incorporates items of construction machinery in schedule A of order L-192. Special sales of these items may be made without restriction, however, to the Army, Navy, Maritime Commission, War Shipping Administration, and the military forces of any lend-lease country.

**GOLD MINING MACHINERY:** WPB has established a policy to permit gold mining firms to obtain such materials and equipment as will enable them to rehabilitate properties and machinery and make the mines available for immediate operation when WPB revokes order L-208. Equipment covered by priorities regulation No. 24, which permits placement of orders for capital goods needed after the war, may be obtained by making application to WPB field offices. If preference ratings are needed to obtain other equipment and materials, applications should be made to the Mining Division, WPB, Washington.

## L ORDERS

**METAL FURNITURE:** Steel seating equipment designed for use at a workbench or production machine, steel work benches that are required for safety, steel foremen's desks, shop boxes, stacking boxes, tool cases and tool room shelving inserts may be sold without specific authorization from the WPB. Manufacturers also are permitted now to fill orders for not more than \$25 worth of any type of metal furniture and fixtures without specific WPB authorization. Products covered by order L-13-a are subject to the "spot authorization" procedure established in priorities regulation No. 25. Except in certain cases, applications on form WPB-1319 for authorization to transfer metal furniture and fixtures are to be filed by the ultimate consumer with the nearest WPB field office. The exceptions follow: Application involving purchases by the Army, Navy, Maritime Commission and War Shipping Administration as well as cases involving tax amortization should be filed with the WPB, Washington. Applications involving export should be filed

with the Foreign Economic Administration, Requirements and Supply Branch. L-13-a)

**ESCALATORS:** Order governing elevators and escalators has been amended to permit any manufacturer to obtain permission to make an escalator under provisions of priorities regulation No. 25. (L-89)

**SNOW SHOVELS:** Snow shovels that may be made only from steel obtained from idle and excess inventories are no longer limited to two types with certain gages for the blades. Permitted size of the blade remains unchanged; 18 inches wide, 15 inches long. (L-157)

**TIRE CHAINS:** Order governing automotive and tractor tire chains and chain parts has been amended to permit any person who wants to use more metal for tire chains than the quota fixed by order L-201, or a person who has no quota under the order, to apply for permission to do so as explained in the "spot authorization" order, priorities regulation No. 25. (L-201)

**HARDWARE:** Restrictions have been removed on the use of aluminum and zinc in builders' finishing hardware, cabinet locks and padlocks, and on the use of brass in essential working parts of cylinder locks. Manufacturing restrictions based on end-use of products also have been removed. A manufacturer is permitted now to produce both heavy-weight and light-weight door bumpers instead of only one weight. (L-236)

**FOOD PROCESSING MACHINERY:** Order governing food processing machinery has been amended to permit applications by persons who want to make such machinery in quantities greater than permitted by order L-292 and by its quota schedules. These manufacturers now may apply for permission under provisions of the "spot authorization" order, priorities regulation No. 25. (L-292)

## M ORDERS

**COPPER:** Copper may be used now as an undercoating for chromium and nickel plating while copper-base alloy may be used in the manufacture of spray nozzles for cooling towers, rivets, and lining for pocket cutlery, heads for laundry net and identification pins, screens and points for water wells. Since the use of copper is also permitted in the manufacture of certain pulp and paper machinery and equipment, the filing of appeals for these items no longer will be necessary. (M-9-c)

## PRICE REGULATIONS

**CONSUMER GOODS:** The following items of consumer goods have been added to the list on which manufacturers may apply for an adjustment in their maximum price, provided the increase will be absorbed at a subsequent level of production and distribution and will not increase the established retail selling price: Garment hangers, galvanized ware, cutlery, assembled wood furniture parts, mopsticks, mops, mop wringers, mop wringer and bucket combinations, carpet sweepers, public seating equipment, carriers for delivering bottles (except cases), coin-operated vending and amusement machines, pens and pencils, lockers, shelving, and blow torches. (No. 188)

**CASTINGS:** Malleable and gray iron castings sold by "regular resellers" as parts or subassemblies of the types listed in appendix A or B of maximum price regulation No. 136 have been excluded from coverage by regulations 241 and 244, respectively. The term "regular reseller" means a purchaser of castings for resale who customarily represents himself in the trade as a source of supply of such parts or subassemblies through the issuance of catalogues, price lists or other advertising matter circulated generally to the trade in which such parts or subassemblies are designated by name. The seller who is the recipient of a relief order is not permitted to compute his maximum price for the castings by adding both the increase granted by the relief order and the increase granted by the amendment of the regulation. He may add either of these increases at his option or he may apply to OPA for permission to add both. (Nos. 241, 244)



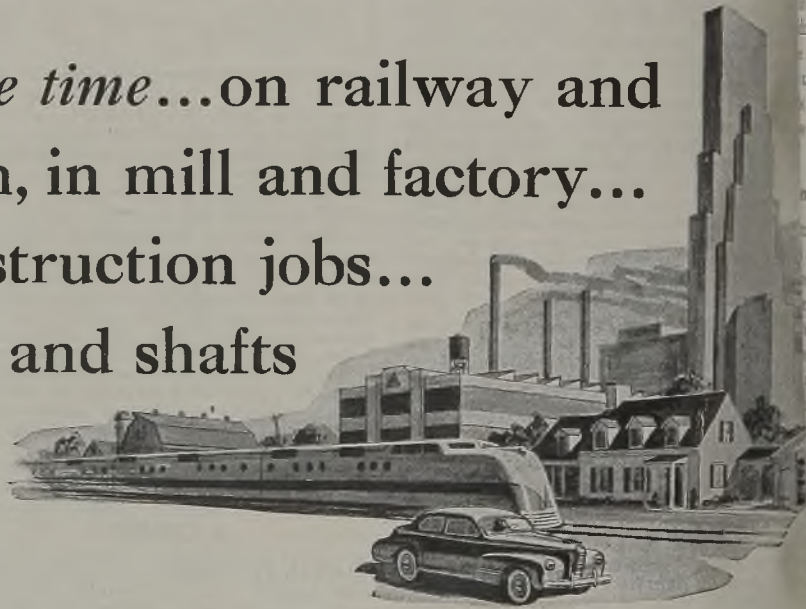


*Protecting the vital*

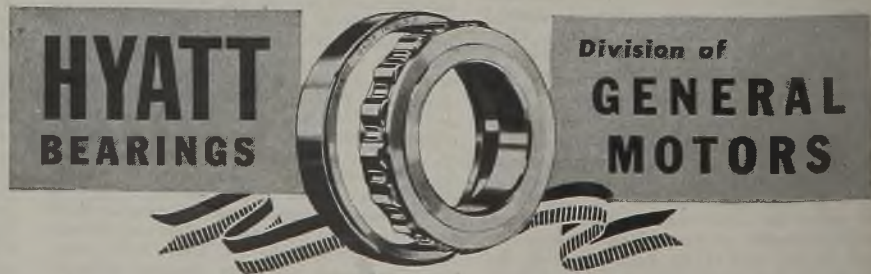
operating parts of modern

war equipment are the millions of care-free  
**Hyatt Roller Bearings...into which we build**  
 great stamina and capacity, while holding  
 them true to required precision tolerances..

*And at the same time...on railway and*  
 highway and farm, in mill and factory...  
 oil fields and construction jobs...  
 wherever wheels and shafts  
 turn...Hyatts are  
 serving America!



*Hyatt roller bearings are built to last—and require a minimum of care. But don't forget to give them the proper attention all precious anti-friction bearings deserve today.*



**HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY**

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# MIRRORS of MOTORDOM

**Ford makes front pages with announcement he plans to increase wages "just as soon as the government permits." Proposal, frowned on by government economists, may be aimed to soften blow of coming shorter work-week**

EVERY 15 years comes a startling pronouncement from Henry Ford on the subject of wages. Back in 1914 he rocked the industry and the country with his decision to pay his employes a minimum of \$5 per day, when the average for the industry was something over \$3. Again in 1929 he stole the front pages with a general boost to \$7 a day and, now, after another 15 years, he declares once more he will raise the wage level of his employes "just as soon as the government permits."

The announcement again made all the front pages and came just at the time when the War Labor Board was considering ways and means to relax the Little Steel formula for holding the line on wages. There seems little doubt some method will be devised to allow wages to spiral up another notch from the 15 per cent advance allowed by this formula. Consider, for instance, the fact that a few minutes after the CIO convention at Grand Rapids had voted by a narrow margin to discard the no-strike pledge another vote was arranged and it turned out to be unanimously in favor of upholding the no-strike agreement! A telephone call to Washington doubtless was the answer, so look for wage controls to be eased before the election. Another case of "clearing everything with Sidney."

### Present Wages Above Average

Government economists generally frowned on the Ford announcement of his desire to raise wages which are now well over the average for all industry. Few working people in Ford plants receive less than \$1 per hour. Of course, recent adjustments like that at Willow Run where the work week was reduced from six to five 9-hour days means less take-home pay—22 per cent less to be exact—and the Ford proposal to raise the basic hourly wage really may have been intended to soften the blow of the shorter work-week which is coming in all war production and eventually in civilian production.

Tucked away in the Ford statement, however, was another reference which carries a good deal more import. Mr. Ford said that he would like to raise wages for all those who are willing to give "a full day's work for a full day's pay." Right there he hits at one of the most disturbing factors in production these days—the serious drop in man-effort, which has been estimated as high as 40 or 50 per cent off from the 1941 level. If a wage increase can persuade man-effort back to somewhere near where it stood three years ago, then perhaps it can be absorbed without blitzing costs

too seriously. No indication was given as to just how far Mr. Ford proposes to raise wages, but 20 per cent might be a good guess. At least his early announcement will take a lot of the punch out of any subsequent government announcement with respect to breaking the Little Steel formula not to mention any plans the UAW-CIO may be cooking up to "do a job" on wages for its members.

### "Combined Operations" Reviewed

About six weeks ago, as General Motors officials were crystallizing their plans for return to civilian production, the term "combined operations" was conceived—specifically by S. E. Skinner of the Oldsmobile division, to connote a method of operation whereby necessary war production and a degree of passenger car production could be handled simultaneously. Details were reviewed at the annual GM press party in Detroit which Paul Garrett, vice president, has arranged in recent years, but prefatory remarks of Mr. Garrett and C. E. Wilson, president, indicated that if the planners

had been able to foresee how rapidly the war was going to move in Europe and how official sentiments in Washington were to change, they probably would have developed something quite a bit different, simply proving again that the best-laid plans are often obsoleted by the rush of events.

At any rate, the GM plan is tied in to three dates, designated V-1, V-2 and V-3, or, respectively, the fall of Italy, fall of Germany and final victory. It was determined that production under the combined operations plan would start not later than V-2 plus 90 days. To accomplish this, the following timetable of things to be done was drawn up:

#### V-2 minus 90 days:

1. Develop plan to reconvert partially to automotive production by all allied and other than allied sources which supply parts.
2. Develop plant area layouts, determine essential machine tools, check tooling, dies, etc.
3. Determine and order machine tools needed for replacement.
4. Prepare engineering releases covering final design, materials, etc.

(These things, with the possible exception of some phases of No. 4, have now been done).

#### V-2 minus 60 days:

- 1 Follow up machine tool sources to



**WHAT'S THAT, CHAMP?** Vera Anderson, world's champion woman welder, and K. T. Keller, president, Chrysler Corp., have a chat on her welding methods during his visit to the Ingalls Shipbuilding Corp. yard at Pascagoula, Miss.

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establish definite delivery dates.

2. Recheck all existing tooling and dies at all sources.

(These steps likewise have been taken, but machine tool sources could make no delivery promises, because auto company orders are nonrated, and most builders are loaded down with rated orders and contract work, say they can make no commitments on nonpreference work).

**V-2 minus 30 days:**

1. Receive, install and tool up new machines which have been ordered.

2. Make required plant rearrangements.

(Devoutly to be wished, these steps still have to materialize).

**V-2 Day:**

1. Obtain tentative release of raw material from government agency for use in manufacturing essential civilian products.

2. Order raw materials from all sources.

(It is considered likely these may come even in advance of V-2, perhaps have

been obviated by recent WPB declarations).

**V-2 plus 45 days:**

1. Begin fabrication of all component parts and shipments to assembly plants.

**V-2 plus 90 days:**

1. Distribution of cars to dealers; actually the start of the "combined operations" plan.

### Seek Written Authorizations

Engineering manpower needed to develop specifications and prepare materials and parts releases has been approved for release up to 1 per cent of the total working force, according to verbal promises of the WMC companies are being careful not to overstep any phase of reconversion, and would like to have written authorization for such transfers.

More crucial from the standpoint of actually resuming production is the mat-

ter of obtaining critical or "key" machine tools. GM divisions say they now have on order about \$25,000,000 worth of such tools on which they can obtain no delivery promises and without which not a car can be built. However, when the effort is made to pin down some official to state specifically just what types of machines are involved, the answer usually is vague.

The key machines are reported not in the special-purpose category, since most special-purpose automotive machinery was not adaptable to war production and hence was placed in storage or left idle in plant space not required. Some of these machines, it is true, were extensively rebuilt, even beyond the point where they could ever be restored to their original use. If the machines are not special-purpose types, then they must be standard types, and if they are standard types, it would appear units might be available from present government surpluses or WPB pools, but the automobile men say no.

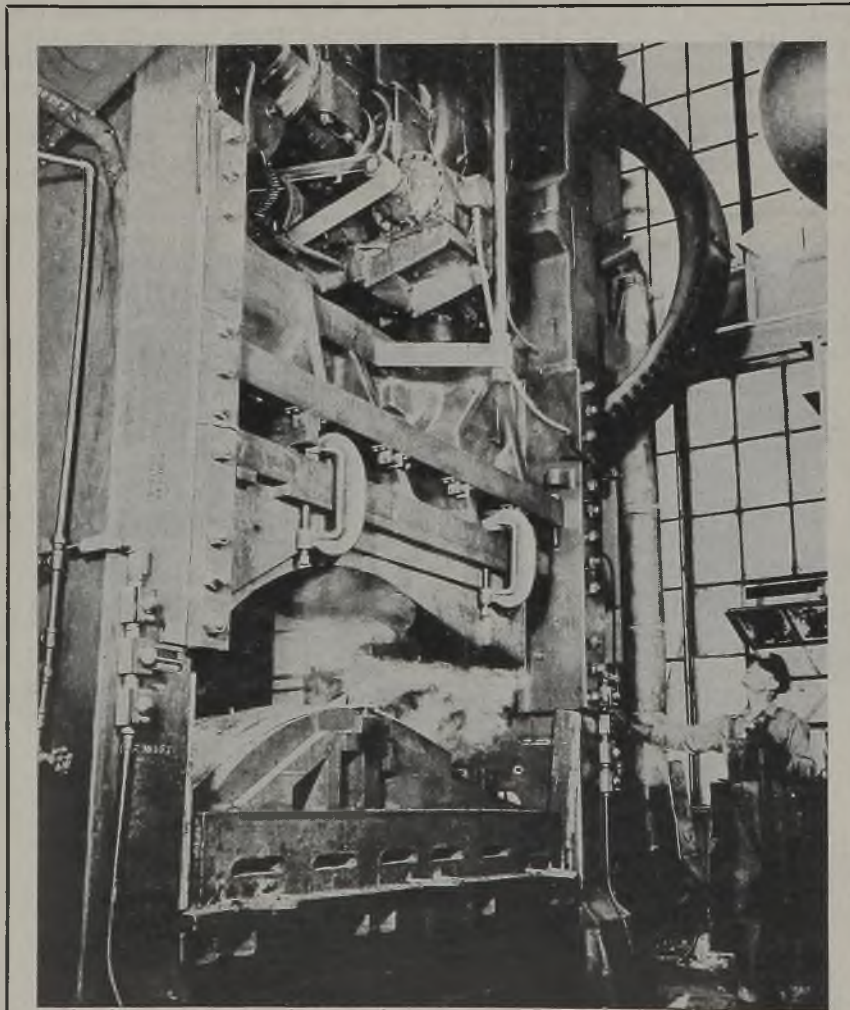
Another trouble spot now looming on the horizon is with respect to steel sheet and strip. Currently deliveries on these products range from 4 to 6 weeks. If on V-2 day (and further assuming V-2 will arrive on any one day which doubtful) the services should trim the requirements 40 per cent, this might mean just chopping off this much tonnage for the far end of the delivery schedule and thus not a pound of such steel would be available for early shipment to motor plants. The alternative would be to chop schedules immediately by 41 per cent and release capacity which could be switched to automotive rollings; in this event, the question becomes what steel capacity will be continued on war production and what will be released for automotive requirements. The intercompany scrambles for the civilian tonnage which would then result can easily be imagined.

### Draws Up Disposal Plan

Detroit Ordnance District, working in co-operation with the machine tool section of the district WPB office, has drawn up what it hopes will be a pattern for disposal of government-owned equipment to war contractors. So far it covers only tools owned by Ordnance in Michigan plants, which number about 30,000. Any contractor or subcontractor now operating these tools may immediately purchase machines that he would like to have, price being in accordance with the Clayton SWPA policy of cost less 15 per cent, with a sliding scale of depreciation. The catch is that the machines so bought must remain where they are until the contract on which they are operating is officially terminated.

Robert Grindley, head of the machine tool section, figures the motor industry can obtain 60 per cent of its tool requirements from the 150,000 government

(Please turn to Page 164)



**PRESSER:** This 1000-ton Toledo press forms armor plate for tanks at the bumper division of Electric Auto-Lite Co. Formerly manufacturing automobile bumpers, hub caps and spring covers, this plant now is wholly engaged in processing armor plate



# Every lubricant sealing problem individually engineered

Three decades ago, the automobile was still in its infancy. The unit type seal on which so much of its brilliant performance depends today had not been developed. But three decades ago, Michigan Leather was already working with sealing problems and mechanical leather packings for hydraulic and pneumatic applications and, since its introduction, has been specializing on sealing problems involving unit type seals.

Our engineers have solved, with varied designs of unit type seals, a vast number of sealing problems for the automotive, agricultural implement, aircraft and many other industries—starting always from the standpoint that adequate and efficient sealing rests primarily on seals designed and engineered individually for the conditions involved in each case.

It is on this basis of scientific approach to effective sealing, whether your case concerns much needed improvement in existing designs and production or new products about to enter the design stage, that we suggest you consult us. Let us make a thorough analysis of the conditions involved and then specify seals designed and engineered especially for your products.

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## Aircraft companies look to postwar future as time approaches when war orders will be slashed sharply. Consolidated Vultee contracts to build experimental model of highway bus with aircraft-type engine and aluminum body

POSTWAR future of the aviation manufacturing industry is currently being thrown into sharper focus as the time approaches when war orders are going to be slashed further. Production cut-backs and reorientation have already been instituted in numerous plants, and a vague uneasiness is apparent over further near-term shifts.

Management of Consolidated Vultee has broadcast to its thousands of employees an extended statement entitled, "We face the future," presenting what is termed a "frank discussion of two main questions—how close are we to the end of the war? and what will the postwar future of employes be?" It is a rather curious combination of a strong plea to maintain present production effort and a recognition of the coming deflation.

"Let's make no mistake about one thing," the statement reads. "The end of the war will bring a contraction from the high peak of production which we have attained during the war. Let's make no mistake about another point. This corporation cannot determine now what our production level will be then, nor is it in a position to guarantee employment to any specific number of workers in peacetime production.

"But we do give you this assurance. We firmly believe that the organization which has been developed during the

war period is so capable that this corporation will be able to more than hold its own against any competitors in the field, and that we will get our full share of the future aircraft business in either war or peace . . . And we give you the further assurance that such postwar thinking and planning as we have been able to do, without interfering in the slightest with our war production, has been done . . .

### Discusses Future Status of Employees

"We know there will be a decrease in our activity from its present high level. But we also know that many of our workers are here only as a wartime duty, and that with the end of the war emergency they will wish to end their employment . . . The voluntary departure of these people, in combination with our faith in the future of the aircraft industry, leads this corporation to believe that many of you who want to remain with this company permanently will have a good chance to do so . . . We give you the further assurance that the most loyal and able workers and supervisors in every department and division will receive the consideration to which they are entitled as to future employment. This means just one thing. What you do today is determining where you will be tomorrow. A good record now is your best assurance of a good job then."

What unions will have to say about such a proposal, as far as it affects seniority provisions, remains to be seen, but it will doubtless be plenty.

One tipoff as to Consolidated's postwar planning, outside of the aviation industry, came with the recent announcement it had been awarded an experimental contract to build a large highway bus (STEEL, Sept. 4, p. 69), embodying aircraft type of radial engine, a new form of wheel suspension, and an aluminum body built along airplane lines.

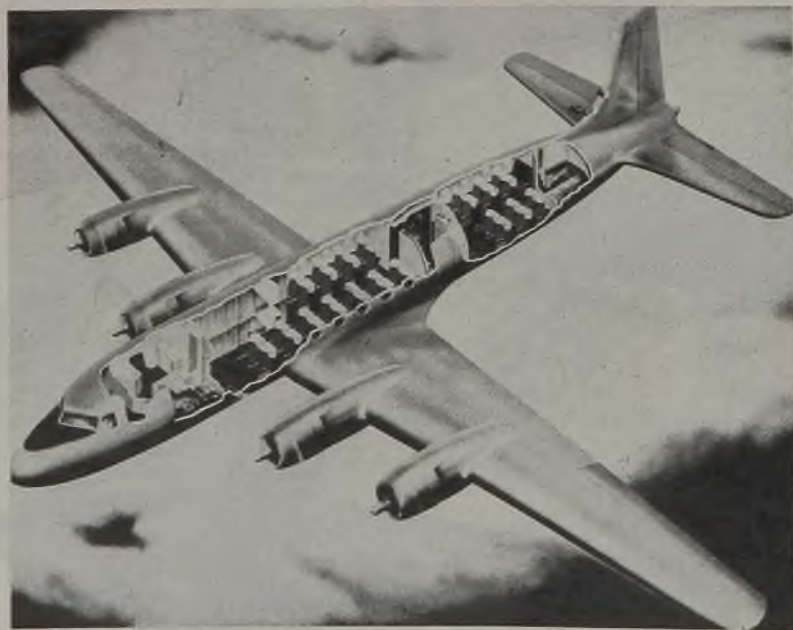
Nothing shows more strikingly the enormous expansion undergone by leading aircraft plants than some of the recently issued financial reports for 1943 operations. In the five years from 1939, North American's production of airframes in pounds soared from 2,267,837 to 65,197,828 pounds, or roughly 3000 per cent and 11 per cent of the nation's total. In the same period dollar volume of sales kept pace by increasing from \$27,608,651 to \$509,139,659; yet net income percentage to sales dropped from 25.67 per cent to 1.33 per cent. Gross earned surplus now is well over \$16 million. Total NAA employment now is close to 66,000, of which 31,500 are women. Area productivity is shown by the fact that in the 1943 fiscal year, the company produced 11,055 pounds of airframe for each 1000 square foot of plant space, figure comparing with 4370 pounds in the 1941 fiscal year. Employee productivity showed a similar increase from 622 pounds in 1941 to 990 in 1943.

### Design Changes Consume Much Time

Staggering amounts of time have been required for engineering design changes in military aircraft. For example, North American expended 78,220 hours of such engineering time to get the first Mustang P-51 fighter plane into the air in 1940 and in 1943 alone a total of 554,730 engineering man-hours were applied on design changes in this airplane. Similarly on the B-25 Mitchell bomber, 260,490 engineering hours were expended on the original design, while in 1943 432,260 hours were expended in the NAA California division alone on design modifications.

Approximately 29 per cent of NAA's 3,453,033 outstanding shares of stock continue to be held by General Motors Corp.

While it may not be generally realized, North American had larger dollar volume of sales in 1943 than did Boeing Aircraft in Seattle, the latter's total being around \$490 million, while NAA topped \$500 million. Boeing has just issued a 16-page report on its 1943 record which stresses among other things, the extensive amount of engineering time required in the development of large bombers, such as the B-17 and B-29 models developed by Boeing. The company's engineering department at Seattle numbers 3300 persons, and in all the company's military projects for 1943 required expenditure of 8,479,967 man-hours of engineering at Seattle and at the Wichita, Kans., division. This is doubtless a record that



**SUPERLINER:** Design drawing of the new Douglas airliner, 93 of which have been ordered by leading airlines. While this is a sister model of the Army C-54 four-engined transport, it will have greater speed, power and passenger space



**ONE OIL CHANGE**  
and this "chaser" tapped  
**10 TIMES**  
**AS MANY SHELLS!**



## **SUNICUT**

**permits 21,600 more pieces per chaser**

Twenty-four thousand shells instead of twenty-four hundred per chaser life! A big saving in tool setter's time . . . a big increase in output per machine tool. All because a large manufacturer of high explosive shells changed the cutting lubricant on a tapping operation to Sunicut, the transparent, sulphurized cutting oil developed by Sun Oil Engineers.

**Greater production demands** required that they tap more shells per chaser grind . . . more shells per chaser life. So they asked Sun Cutting Oil Engineers how it could be done. Sunicut was the answer . . . the proof is in the results.

**With Sunicut . . . output increased** from the old rate of 600 pieces, to 4300 pieces per chaser grind . . . and from 2400 pieces, to 24,000 pieces per chaser life. In addition, finish was improved.

**Sunicut's advantages** are extremely high heat-absorbing and metal-wetting ability, and clearer work visibility. These make possible longer tool life, greater speeds, finer finish, and increased operator interest. Find out what Sunicut can do in your own plant . . . under your own operating conditions. Consult a Sun Cutting Oil Engineer, today. Write **SUN OIL COMPANY • Philadelphia 3, Pa.**

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# **SUN INDUSTRIAL PRODUCTS**

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First Sikorsky R-6 helicopter to be built by Nash-Kelvinator Corp. at its Detroit plant takes off from the company's "pocket" airport, straight up, on its first test flight

no other aircraft manufacturer, if indeed any manufacturer, can match, and illustrates the endless detail involved in building and perfecting large aircraft.

Boeing also points with justifiable pride to the progress it has made in the economical utilization of raw materials. For example, based on the total weight of B-17 parts produced at Seattle and branch plants, 2.183 per cent were rejected by company inspectors because of imperfections. Of these, rework has been possible on 1.494 per cent and 0.2 per cent has been reclaimed as raw material, leaving only 0.489 per cent scrapped. The company's material planning layout group contributes importantly to this record by developing the most efficient and economical method of cutting and forming parts, and by cooperating with a tool design group in working out efficient production tooling.

Aviation's need for continued technological development to assure the country's supremacy in the air is being stressed by far-sighted executives of the industry continually. Speaking recently before the war contracts subcommittee of the Senate committee on military affairs, J. Carlton Ward Jr., president of the Fairchild Engine & Airplane Co., and a leading spokesman for the industry, recommended two approaches. First, through research and development, he advised that:

1. Present development contracts should not be terminated.

2. Military research, design and development should be continued on a constructive basis through competitive private industry.

3. A production program for the industry should be maintained to retain its ability to establish production processes and to permit the air forces to become

familiar with the handling of such planes. It is assumed that 20 per cent of the number of airplanes in the air forces will be replaced annually. This would provide the industry a basis for planning, if it knew the likely size of the postwar air force.

4. New and advanced models of all types of military aircraft required for a balanced air force should be designed. Quality of the product would be the primary factor in placing orders.

Secondly, on the matter of standby capacity, Mr. Ward observed that air power presupposes several elements, among them airplanes, trained personnel, technical staffs, management and productive capacity. All are essential. A strong industry must be maintained with operating productive capacity at least equal to the current needs of the armed services. Additional capacity, preferably through standby plants, should be available and ready as the necessity arises.

## Willow Run Turns Out 6000th B-24 Bomber

Willow Run bomber plant of Ford Motor Co. recently turned out its 6000th B-24 Liberator almost two years to the day after the first ship was delivered to the flight department. More than half this number has been completed since the first of this year, during which period production has averaged about 100 airplanes a week. Of the 6000 bombers built, approximately 1900 were shipped 80 per cent complete as major components for final assembly at other plants.

Possibility of moving airframe production out of automotive plants into Willow Run to permit these motor plants to resume car manufacture is being studied.

## Nash-Kelvinator's First Helicopter Is Tested

First helicopter to be built by Nash-Kelvinator's Corp. for the Army Air Forces has completed test flights over Detroit marking the successful application of automotive assembly line techniques of mass production to the manufacture of this versatile new-type of aircraft.

Embodying a number of improvements over earlier models, the new version of the Sikorsky helicopter differs radically in appearance from models existing at the time military contracts for the new aircraft were signed.

The R-6, as it is called, is a single rotor type of helicopter, having three blades with a tip to tip diameter of 3 feet. The new three blades of the auxiliary tail rotor, which acts as the ship's rudder, have a tip to tip diameter of slightly more than 7 feet.

Functional design of the craft is basically that of the first successful helicopter in the United States—designed and built by the Sikorsky Aircraft division of United Aircraft Corp. Much of the process engineering work on the R-6 was completed at Nash-Kelvinator peacetime automobile body plant Milwaukee. While mock-ups were being developed at that plant, the company's refrigerator plant in Grand Rapids was being readied for fabrication processes. Subassemblies built in Grand Rapids are shipped to Detroit where the helicopter is assembled and flight tested.

The craft has a top speed in excess of 100 m.p.h., carries sufficient fuel for a flight of 5 hours and will climb 4000 feet in less than 7 minutes. Normal gross weight of the ship is 2600 pounds. Ambulance litters can be carried in capsules placed on either side of the fuselage with the alternative of using twin bomb racks. The cabin is sound proof and heated.

The R-6 is a two-place aircraft with dual flight controls. The pilot's cabin is at the forward section of the streamlined fuselage, all-metal except for cabin section supports made of plastic impregnated glass fiber cloth molding and mounted on an aluminum floor.

Landing gear is conventional with two main wheels having cantilever struts with a small tail wheel midway between nose and tail and a nose wheel to prevent nosing over. It is equipped with a high frequency radio communication set. Power is furnished by an air-cooled Franklin 245-horsepower engine.

A driveshaft and transmission mechanism directly above the motor connects it to the rotor head and three main rotor blades which give the craft lift and lateral flight. Alternation of pitch of the blades provides control of the aircraft. A smaller rotor, mounted at the left side of the long conical section, provides directional control. This tail rotor revolving in the opposite direction of flight counteracts the twisting tendency or torque of the main rotor blades.



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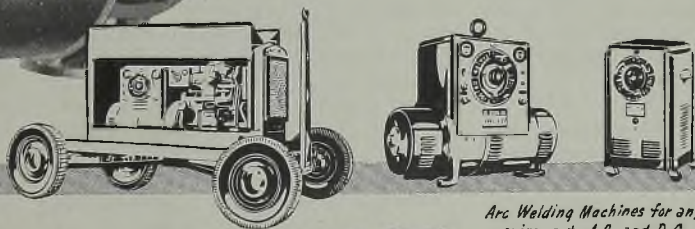


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LESLIE J. WOODS



WILLIAM E. CUSTAR



CHARLES HART



MELVILLE IRWIN

Leslie J. Woods has been named manager, Industrial Radio division, Philco Corp., Philadelphia, with headquarters in Detroit, where Philco will continue to maintain special facilities to serve the automobile and aircraft industries. Martin F. Shea has been named assistant manager of the Industrial Radio division.

R. J. Nixon has been elected treasurer, International Detrola Corp., Detroit, to succeed John Hancock, who becomes general manager of the company's machinery plants in Elkhart and Indianapolis, Ind. R. L. Dillon has been made assistant secretary and assistant treasurer, John H. Sennott becomes controller, and R. P. Schmelzer has been named assistant treasurer.

Thomas Boyd has been appointed assistant superintendent of labor relations for the Great Lakes, Michigan and Blast Furnace divisions of Great Lakes Steel Corp., Ecorse, Mich.

Leo R. Kiley has been appointed Detroit district engineer for Vilter Mfg. Co., Milwaukee.

Don W. Walters, sixth regional director, Smaller War Plants Corp., Chicago, has resigned to accept appointment as managing engineer, Inland Empire Research Corp., Spokane, Wash.

Walter Bowers has been appointed vice president and treasurer, Lawrence Aeronautical Corp., Linden, N. J. Recently Mr. Bowers resigned as compliance operations chief with the War Food Administration, Washington.

Louis J. Schuster, assistant treasurer, Chase Brass & Copper Co. Inc., Waterbury, Conn., and C. Harold Blomgren, comptroller, Isaacson Iron Works, Seattle, have been elected to membership in the Controllors Institute of America.

William B. Mercer, on loan to WPB as chief of the Conveyor and Mechanical Power Transmission Equipment Section, Material Handling Division, has

rejoined Robins Conveyors Inc., Passaic, N. J., to handle sales of Robins materials handling machinery in the New England territory.

William E. Custar has been named assistant manager of the Aircraft division, Lamson & Sessions Co., Cleveland.

Donald W. Douglas, president, Douglas Aircraft Co. Inc., Santa Monica, Calif., has been elected president of the National Aircraft War Production Council Inc., and Alfred Marchev, president, Republic Aviation Corp., Farmingdale, N. Y., has been elected vice president. Mr. Douglas also was chosen to head the Aircraft War Production Council Inc., West Coast.

Officers of the American Foundrymen's Association headquarters staff elected for the coming year are: Secretary, R. E. Kennedy; director of the newly-created technical development program, N. F. Hindle; treasurer, C. E. Hoyt; assistant treasurer, Miss Jennie Reininga; business manager, William W. Maloney.

Thomas Burtch, who has been western representative of the Army Air Forces branch of the Smaller War Plants Corp. in Los Angeles, has been appointed regional director of SWPC, Chicago, to succeed Don W. Walters, resigned. Mr. Burtch is an expert on contract renegotiation and termination.

Robert Crooks Stanley, chairman and president, International Nickel Co. of Canada Ltd., Toronto, will receive the 1944 ASM Medal for the Advancement of Research at the annual dinner of the American Society for Metals, Oct. 19, in Cleveland.

J. S. Allen, vice president, Fostoria Screw Co., with headquarters in Detroit, has been named director of sales of a new special products division of Bowser Inc., parent company of Fostoria Screw. R. H. Damon, president of Bowser, recently announced organization of the

new division which will develop plans to absorb war-built capacity of the company in the fields of machined forgings, castings, small stampings, special screw machine products and light assembly work. J. C. Allen Jr., hitherto district sales manager for Fostoria at Detroit, has been appointed general sales manager of the company which operates plants at Fostoria and Tiffin, O.

Charles Hart, former president, Delaware River Steel Co., Chester, Pa., and active in the iron and steel industry for more than 50 years, particularly in blast furnace operation, has opened a consulting practice in Media, Pa., Charles Hart and Associates, Ridley Creek road.

Melville Irwin, who had been associated with Wellman Engineering Co., Cleveland, for a number of years, resigning last fall as purchasing agent, has been appointed district director in the Balkan Mission of the United Nations Relief and Rehabilitation Administration. Mr. Irwin leaves immediately for Cairo.

Roy T. Hurley has been elected vice president, Bendix Aviation Corp., South Bend, Ind., in charge of postwar re-conversion problems.

John A. Fraser, for the past two years plant manager, Die Typing Corp., Pontiac, Mich., has been named metallurgist for Starr Heat Treating Co., Detroit.

William Goodman, consulting engineer for the Trane Co., LaCrosse, Wis., and designer of air conditioning equipment, has been appointed research professor of refrigeration and air conditioning at Illinois Institute of Technology.

W. H. Wiewel, who has been chief of the WPB Steel Division's Tubing Branch, has returned to Jones & Laughlin Steel Corp., Pittsburgh.

E. E. Quimby and Frank H. Caylor have been elected commercial vice presidents of Economy Pumps Inc., Hamil-



ton, O. Mr. Quimby is senior partner of Quimby-Ryan Co., New York, which has represented Economy Pumps since 1928, and Mr. Gaylord recently resigned as vice president and director of Hoffman Specialty Co., Indianapolis, Ind. Mr. Gaylord will make his headquarters in Chicago.

L. D. Stull has been appointed Western division sales manager for Apex Electrical Mfg. Co., Cleveland. Formerly he was affiliated with Frigidaire division of General Motors Corp.

Gordon Lefebvre, president, Cooper-Bessemer Corp., Mt. Vernon, O., and Grove City, Pa., has been elected to the executive committee of the Machinery and Allied Products Institute.

Three new divisional sales managers of the Hudson Motor Car Co., Detroit, are: C. A. J. Hadley, Northwest division, Chicago; E. J. Beguhn, Southeast division, Washington, and W. S. Milton, Southwest division, St. Louis.

Cecil Connor has been named manager of the Parts division, U. S. Machine Corp., Lebanon, Ind.

John A. Coleman has been named manager of the direct factory office which Ross Heater & Mfg. Co. Inc., Buffalo, has established in Houston, Tex., at 901 Citizens Bank building.

Paul A. Herr and Harris H. Robbins have become field engineering representatives in the Philadelphia district for Kennametal Inc., Latrobe, Pa.

Dietrich Bros. Inc., Baltimore, have announced election of Horace W. Dietrich as executive vice president, James E. Maher as vice president, and Walter D. Barnes as secretary and assistant treasurer.

Omer L. Woodson has resigned as vice president and Georgia division manager

for Bell Aircraft Corp., Buffalo. His duties at the Marietta, Ga., plant, which builds B-29 Superfortresses, are being assumed by Col. Carl A. Cover, one-time executive vice president of Douglas Aircraft Co. and recently on active duty with the Army Air Forces supervising modification work on the B-29.

Jack C. Wilson, former senior administrative officer of the United States Army Signal Corps production field office in San Francisco, has been appointed Pacific district manager for the Radio division of Bendix Aviation Corp., South Bend, Ind.

Philip A. Ray has been transferred to the Denver office of Hercules Powder Co., Wilmington, Del., to handle all technical service in the Denver area for flotation plants and naval stores products.

Howard J. White and James S. Denham have been appointed to newly-created positions of assistant managers of the Rayon department, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. Frank B. Ridgway succeeds Mr. White as manager of the company's Rayon division, and William Shackelford succeeds Mr. Denham as manager of the Acetate division. Charles A. Cary has been named manager of the Nylon division, to succeed E. K. Gladding, recently appointed director of the Development department.

David B. Joseph has been appointed representative in southern Ohio for the Samuel Greenfield Co., Buffalo. For many years Mr. Joseph served as vice president and treasurer of Edna Brass Mfg. Co., Cincinnati.

John B. Girdler has been appointed sales manager, eastern district, Vanadium Corp. of America, New York.

William C. Sleeman, works manager, Bessemer, Ala., plant, Pullman-Standard



ROBERT J. JAMIESON

Car Mfg. Co., has been appointed assistant manager of all the company's freight plants. He remains as Bessemer works manager and will have offices both in Birmingham, Ala., and in the company's Chicago headquarters.

Robert J. Jamieson, for 16 years district sales manager, Kutztown Foundry & Machine Corp., Kutztown, Pa., has established a sales organization under his own name with offices at 225 Broadway, New York, and 1421 Chestnut street, Philadelphia. Mr. Jamieson will continue to represent Kutztown Foundry. In addition he will handle sales for Ford Bros. & Co., Philadelphia, and the Harrison Bolt & Nut Co., Harrison, N. J.

Clyde B. Faverty, formerly manager of the car shops, Bethlehem Steel Co., Johnstown, Pa., has joined Pullman-Standard Car Mfg. Co., Chicago, as assistant to the manager of freight plants in charge of plant and foundry improvements.

Howard R. Faust has been named president and general manager, Berlin Chapman Co., Berlin, Wis., succeeding Frank D. Chapman, resigned. Jack Richmond has been elected vice president and will serve as executive officer of the company. Mr. Faust also is president of the R. G. Wright Co., Buffalo.

William H. Scanlon has been appointed manager of the Pacific Coast office of L. B. Foster Co., Pittsburgh. The new office is in the Russ building, San Francisco 4.

R. C. Wilson has been appointed sales manager, Buffalo division, Farrell-Birmingham Co. Inc., Ansonia, Conn. Previously he was assistant to the sales manager of the company.

Russell H. Foss has been appointed New York district sales manager for Hazard Wire Rope division, American Chain & Cable Co. Inc., Bridgeport, Conn.

Walter A. Furst has been named dis-



LEON C. REED



KENNETH J. BURNS

Mr. Reed has been appointed assistant manager, Railroad Sales division, Inland Steel Co., Chicago, and Mr. Burns has become Chicago district sales manager, as announced in STEEL, Aug. 18, p. 100.



strict representative in the Pittsburgh area for the Storage Battery division, Philco Corp., Philadelphia. Formerly he was general contract manager for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and subsidiaries.

**John J. Gillis**, manager of sales, Worcester district of American Steel & Wire Co., Cleveland, has resigned that position, effective Oct. 1, to become affiliated with Spencer Wire Co., West Brookfield, Mass. He has been elected vice president in charge of all sales with the Spencer Wire Co., West Brookfield plant.

Resignation of **Delmar S. Harder**, general manager, General Motors Corp. Fisher Body division fabricating plants, and wartime supervisor of tank and ordnance development and production for the Fisher Body division, has been announced, to become effective at the



**G. RIDER NEFF**

Who has joined Cleveland Cap Screw Co., Cleveland, as general sales manager, noted in STEEL, Aug. 18, p. 100.

close of the European phase of the war. **George C. Paterson** has been appointed general manufacturing manager, Fisher Body division, and **John J. Cronin** has been made general industrial relations director of the division.

**J. H. Jewell** has been appointed manager of the Industry Departments, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

**Mark M. Gladstone** has been appointed controller, American Chain Ladder Co. Inc., New York.

**B. M. Brown** has been appointed manager of the Petroleum and Chemical section, Industrial department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., succeeding **Q. M. Crater** who becomes assistant manager of the Detroit office of the Industrial department.

**OBITUARIES . . .**

**Philip C. Johnson**, 50, president, Boeing Airplane Co., and Boeing Aircraft Co., Seattle, died in Wichita, Kans., Sept. 14, following a stroke. He began his career in 1917 when William E. Boeing recruited him from the school of engineering at the University of Washington. He rose steadily through administrative ranks, becoming president in 1926. In 1933 he was named president of United Aircraft & Transport Corp., a consolidation of a number of leading airlines and manufacturing companies. When this group was broken up in 1934 following the government's cancellation of airmail contracts, he returned to Seattle to take over presidency of the Kenworth Motor Truck Corp., a position he held until his death. In 1937, Mr. Johnson went to Canada to organize a new coast-to-coast air transport system, retiring from this work in 1939, only to be asked to take over the presidency of the Boeing companies again in September, 1939. His vigor and drive had much to do with the success of both the Boeing B-17 Flying Fortress and the subsequent B-29 Superfortress. The company operates several plants in Seattle and Wichita.

**Jaquelin S. Holliday**, 76, chairman of the board of W. J. Holliday & Co., Indianapolis, Ind., iron and steel warehouse, died recently in Indianapolis. He had served as president of the company from 1900 until 1940.

**Frank C. Howland**, 63, general manager and treasurer of the Thomas Phillips Co., Akron, O., died there Sept. 11.

**Roger F. Sherman**, 41, for the past two years engineer, Hydro-Blast Corp., Chicago, died Sept. 16 in Evanston, Ill.

**Maj. Edward Brooks Simmons**, 54, widely known among contractors, who

in 1943 went to Iran at the request of the War Department to superintend construction of 200 miles of highway and docks and bridges for the firms of Foley Bros. & Spencer, and White & Prentiss of New York, died recently in Albany, N. Y.

**John C. Nevins**, 64, who retired in 1937 as vice president and general sales manager, Felt & Tarrant Mfg. Co., Chicago, died Sept. 14 in Evanston, Ill.

**John R. H. Neal**, 64, one of the founders of Root, Neal & Co., Buffalo, dealers in mill and factory supplies, died Sept. 12. Mr. Neal was president and treasurer of the company which he established with the late Samuel Root and the late George F. Root in 1904.

**Albert L. Marsh**, 67, president, Hoskins Mfg. Co., Detroit, died in that city Sept. 17. In 1936 he was awarded the John Price Wetherill Medal of the Franklin Institute, Philadelphia, for his discovery of chromel alloy used widely in electrical heating devices. In 1941 he was named recipient of the Albert Sauveur Medal of the American Society for Metals.

**Lazarus Muscat**, 54, for the past 30 years president of United American Metals Corp., Brooklyn, N. Y., died Sept. 14 in that city.

**Marshall Herdman Telford**, 44, for the past ten years a marine surveyor for the American Bureau of Shipping, and vice president of the Blair Shipyard, Yonkers, N. Y., since it was started in November, 1942, died Sept. 11 in Yonkers.

**Dr. Walter Savage Landis**, 63, vice president, American Cyanamid Co., New York, died Sept. 15 in Old Greenwich, Conn. A former president of the American Institute of Mining and Metallurgical Engineers and holder of nearly 60

patents in the chemical and metallurgical fields, Dr. Landis had received three of the highest awards bestowed by the chemical industry.

**Frederick A. Fable**, chairman of the board and former president, Fable & Co. Inc., Philadelphia, died Sept. 10. Fable had been associated with the metal business for about 65 years.

**Edmund R. Spence**, 70, for the past years president, Rundle-Spence Mfg. Co., Milwaukee, died Sept. 15.

**Charles A. Miller**, 69, president, Eclipse Electric Co., Canton, O., died Sept. 13 in Cleveland.

**I. I. Shonberg**, 62, founder and former president, Alpha Metals Inc., New York, died Sept. 14.

**George W. Smith**, 57, branch manager in Milwaukee for Joseph T. Ryerson Son Inc., Chicago, since that company purchased his concern, Reed-Smith Steel Co., 20 years ago, died Sept. 18 in Milwaukee.

**George C. Bach**, 46, production manager, Stolper Steel Products Corp., Milwaukee, died Sept. 17 in that city.

**Arthur Fletcher**, 47, executive vice president, Sedgewick Machine Works, New York, and expert on aircraft carrier elevators, died Sept. 17 in New York.

**Richard B. Franklin**, 28, secretary and manager, Franklin Iron & Metal Co., Battle Creek, Mich., died suddenly of a heart attack Sept. 9.

**Earl A. Burr**, 66, vice president, Cleveland Quarries Co., Cleveland, died Sept. 15. Mr. Burr began his business career as assistant auditor of Cleveland Stone Co., later the Cleveland Quarries Co.



# Kaiser Seeks "Lowdown" on Plant Disposal Plans of Government

*Coast industrialist hurries to Washington for conference with Commerce Secretary Jones. Indicates interest in acquiring various properties, including Geneva Steel Works. Says outright sale of plants not essential*

SAN FRANCISCO

APPROACHING end of the war in Europe and tightening of the noose around Japan is spurring plans for conversion of wartime plants to peacetime uses, including the steel-producing facilities at Geneva, Utah, and Fontana, Calif.

Latest move in this direction is the visit of Henry J. Kaiser and five of his offspring advisers to the offices of Commerce Secretary Jesse Jones in Washington.

Mr. Kaiser, who operates the Fontana steel mill, builds ships, produces magnesium, cement, airplanes and dozens of other industrial war materials, of course is vitally interested in maintaining his war-born empire after the shooting stops.

So, when Mr. Jones sent letters to 376 private operators of 586 war plants asking whether they wished to acquire any of the wartime plants for civilian production, Mr. Kaiser hastily gathered together his son, Edgar Kaiser, Clay Bedford, manager of the four Richmond shipyards, Dr. Paul Cadman, his economist, Paul Merrin, his chief counsel, and Chad Calhoun, his Washington representative, and took the next train for the national capital.

## Hopes To Reach Agreement

Mr. Kaiser indicated he hopes to reach an agreement for an arrangement which will assure postwar operation of the government plants which he now is operating. In addition he may put in bids for other war plants operated by other interests. Kaiser has indicated in the past that he would be interested in taking over the Geneva steel plant, built and operated by U. S. Steel Corp.

Mr. Kaiser's primary aim is seeing that as many of the war plants as possible are continued in operation after hostilities end. Those that cannot be sold, he believes, should be leased by the government.

"In order to reach our objectives of providing 10 million more jobs than in any prewar year, the United States will need more manufacturing facilities than ever before," he said. "Government plants must be placed promptly in the hands of operators who will use them to create employment. Billions in public money are tied up; some of the plants are the most modern in the world."

Mr. Kaiser pointed out that outright sales of these plants are not essential. The vital thing is to keep them running. "The government can enter lease con-

tracts with private operators that will assure the people obtaining a return on the gross revenue.

"It would be a crime to deprive Americans of the jobs and products these plants could create. The leasing of government plants, of course, should be on an equitable basis. The operator who did not put up the capital to build the plant should not be given an unfair advantage over other companies running their wholly owned plants. The government should charge as much interest as must be paid by operators of privately built plants. But just because the government made the original investment is no excuse for shutting off the people from employment these government plants can create if put promptly in private hands."

Another plea to Jesse Jones for postwar operation of the Geneva steel installation has been made in the form of a resolution adopted by directors of the Down Town Association of San Francisco.

This resolution points out that the West Coast and California especially will be particularly affected by postwar unemployment and reconversion problems, that production of such steel products as shapes, plates, sheets, tin plate and tubular items is essential to the West.

As a result, the association says, continued operation of the Geneva plant is necessary, if such operation is economically possible and also if possible the plant should expand its range of products. The resolution points out the association's desire to see the plant "sold or disposed of to a responsible private operator on terms which will permit it to be profitably operated."

## Closed Shop Nullified in Seized Machine Shops

SAN FRANCISCO

The Navy Department has nullified closed shop provisions of the contract between lodge 68 of the AFL, Machinists Union and 104 San Francisco machine shops.

The plants were seized by the Navy several weeks ago after workers refused to work overtime. Under Admiral H. G. Bowen's orders, open shop conditions are established for the period during which the Navy retains control of the shops. It takes away all compulsion, leaving the union only the weapon of persuasion to hold an estimated 2500 members in the 104 plants.



HENRY J. KAISER

## Plan Survey of Mineral Resources in California

SAN FRANCISCO

Surveys of the mineral resources of California has been started by the Division of Mines of the State Department of Mineral Resources. An appropriation of \$20,000, made by the 1944 special session of the state legislature, will finance the survey.

The fact-finding studies will be made under direction of the State Reconstruction and Re-employment Commission.

## Seeks Full Postwar Employment of War Veterans

American industry should take action now to gear itself for full postwar employment of the disabled veteran, R. S. Rheem, president, Rheem Mfg. Co., declared recently.

Mr. Rheem asserted the disabled veteran can be fitted into the pattern of American production after the war, not as a recipient of charity, but as a full fledged worker at proper wages. The secret, he said, is to fit the machines to the men and women and not the men and women to the machines.

The company, which has fifteen plants, has already embarked on a program designed to provide jobs for disabled veterans. A full study, just completed at the company's South Gate, Calif., plant, Mr. Rheem said, showed that 51 per cent of its total positions could be filled by handicapped persons. He revealed that similar studies are now being made in all of its plants.





## Nazis Lose Important Minerals, Industrial Plants to Allies

*Important iron, steel and munitions output may soon become available to Allies. Demolition damage lessened by speed of advance. Slowdown by workers impaired production of French factories for the Germans*

MAJOR industries of France, fourth largest prewar iron and steel producer in Europe, now are largely in the hands of the Allies. Partially damaged by American and British bombings and by demolition by the retreating Germans, many of these plants nevertheless soon will supply armaments for the Allies; their output is now lost to the enemy.

France in 1939 produced 8,400,000 tons of steel and 7,800,000 tons of pig iron, in addition to large quantities of munitions. Since German occupation of the country, production dropped sharply, although exact figures are unavailable.

In the wake of the retreating foe, stories of slowdowns and more or less passive resistance of French industrialists and workers are unfolding. Recent cables report output in the important Schneider-Creusot steel and armaments plant declined from a normal 20,000 tons a month to 2500 tons. The vast Renault works at Paris, the greatest automobile factory in Europe, has been operating at only 25 per cent of capacity in producing munitions for the Nazis.

The same picture is true in Belgium, which in prewar days had an output of 3,000,000 tons of steel and 3,000,000 tons of pig iron annually, and in Luxembourg, with a 1939 production of 1,800,000 tons of steel and 1,750,000 tons of pig iron.

Demolition damage by the Germans,

while considerable, has been lessened by the speed of the Allied advance. Similarly, the absence of large scale battles in the interior industrial regions has permitted many important plants to escape destruction.

The accompanying map shows the principal sources of minerals which generally have come into the hands of the United Nations in fairly good condition as well as the principal manufacturing centers which were supplying the Reich with war supplies.

The most important raw materials Germany has obtained from France are iron ore and bauxite. French iron ore has represented more than 30 per cent of the total supplies available to the enemy in Europe; French bauxite accounted for more than 40 per cent of the enemy's supplies. Processed goods manufactured by the French industry also have been of considerable importance to Germany.

France had the largest aircraft industry outside Greater Germany, producing more than 5 per cent of the enemy's finished aircraft and more than 12 per cent of the aircraft engines. In addition, the enemy obtained from French industry more than 20 per cent of its trucks, more than 10 per cent of its locomotives.

Germany's economic exploitation of France by regions has been as follows:

Northwestern France accounted for more than 60 per cent of France's coal

*One of the first foreign plants to adopt American mass production methods was the Citroen Works at Clichy, near Paris. A shell factory during World War I, it was converted to the manufacture of automobiles during peacetime and then to munitions output again when the present conflict started. Above is shown the forge shop*

output of more than 40,000,000 tons. The iron ore mined here is high grade and over 2500 tons a day had been shipped to Germany. The local heavy industry produced only about 1,500,000 tons of steel, but the output of locomotives, rolling stock, and rails was considerable.

The large ports of Le Havre and Cherbourg were important to the enemy for coastwise shipping, while the ports of Lorient and St. Nazaire were used as bases for German submarines.

The Paris region manufactured trucks, aircraft, tank parts, machine tools, and antifriction bearings. In addition, the region produced large amounts of pharmaceuticals, the loss of which will be greatly felt by Germany.

The southwestern region of France has been an important source of hydroelectric power fed into a grid system covering most of the country. The chemical industry located here has produced some constituents of explosives used by the Germans, and large rubber factories have turned out over 15 per cent of all new tires in enemy Europe. Some merchant vessels were built for the Germans in the ports of Bordeaux and Nantes, and these ports were also useful to the Germans in their coastwise shipping. The loss of this region of France will sever German land communications with neutral Spain and Portugal and will prevent imports by rail from those countries.

Southeastern France has been obliged



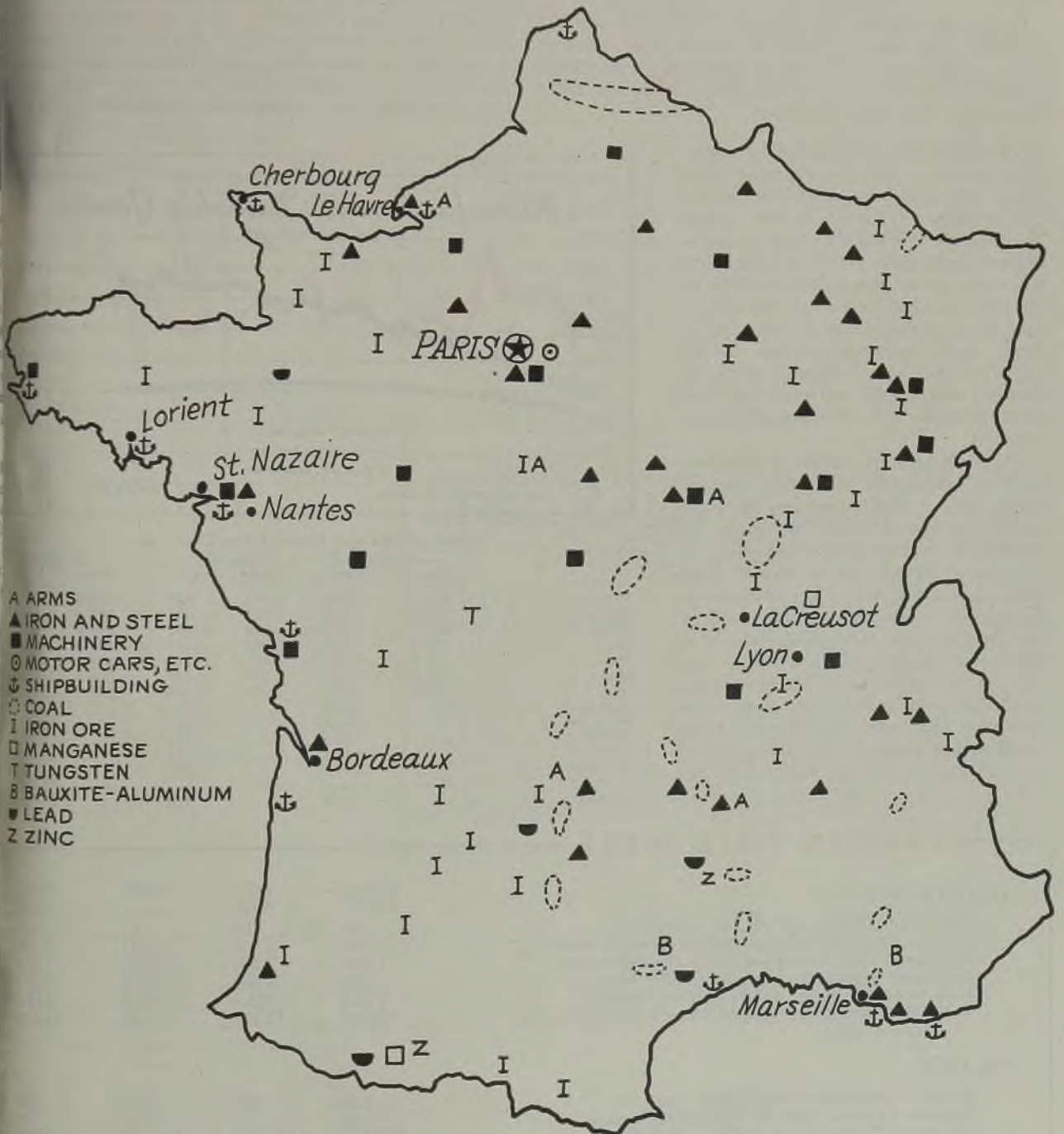
to supply Germany with bauxite, aluminum, magnesium, chemicals, steel, locomotives, arms and munitions. Practically all of the French bauxite is produced in this region. The Germans have lost here a production of aluminum that amounted to about 10 per cent of total enemy supplies, about 12 per cent of enemy Europe's annual supply of magnesium, and important quantities of sulphuric acid. One of Germany's more important sources of war materials has been lost in the

heavy industry located in the region of Lyon-St. Etienne. Germany had obtained large quantities of armor plate, guns, machinery and rolling stock from the great Schneider steel and munition works at Le Creusot.

The northeastern region of France includes the industrial area of Alsace-Lorraine. This area has accounted for more than 85 per cent of the total French output of iron ore and 70 per cent of the French steel. The large textile ma-

chinery industry was converted by the Germans to the manufacture of armaments and aircraft components, as were some of the textile plants. Heavy engineering works have produced machine tools and aircraft engine components as well as guns of all types. Numerous factories have been working on aircraft repair, and large locomotive and rolling stock repair shops have been pressed into service to maintain transportation for the Germans.

## LIBERATION OF FRANCE BLOW TO GERMAN WAR INDUSTRY



The above map depicts the mineral resources and principal industrial facilities of France. Note that important re-

sources have been lost by the Germans. Damage to factories by Nazis was lessened by speedy allied advances



## Cutbacks and Inventory Reductions Affect Output

FURTHER cutbacks in war programs and determined efforts of manufacturers to reduce inventories continue to adversely affect the pace of industrial activity. Order backlogs are still large but pressure for prompt deliveries on many items has eased considerably. Cutbacks to date have not reached the point where they have seriously disrupted production schedules, although this will become an increasingly important factor in the months ahead.

During the latest weekly period for which figures are available, gains were recorded in freight traffic, electric power consumption, engineering construction and truck assemblies; the national steel rate held unchanged, while bituminous coal output declined.

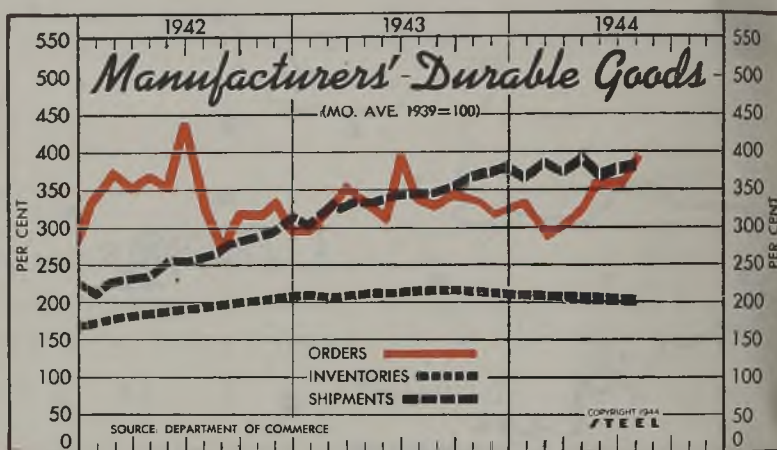
**INVENTORIES**—The decline in dollar value of manufacturers' inventories which began late last year continued in July with a further reduction of \$30 million. This process of liquidation has been particularly noticeable in the durable goods industries where the stabilization of the war program has permitted firms to reduce stocks of raw material. The Department reports inventory declines in July were recorded by all durable goods industries, except iron and steel and their products where a small seasonal increase occurred.

The daily average index of all manufacturers' shipments was little changed during July. Slight increases were recorded for the electrical machinery and automobiles and equipment industries.

A rise of 10 per cent in durable goods orders during July more than offset the reduction in nondurable goods bookings. The electrical machinery group reduced its backlog of unfilled orders 3 per cent in July, while backlogs of other durable goods industries were either equal to or somewhat above the June level. Compared with a year ago, durable goods order backlogs have been reduced 25 per cent.

**CONSTRUCTION**—A 2 per cent increase in building activity in the United States was recorded during August to \$316 million, but was less than half the \$638 million construction valuation registered in August, 1943, the War Production Board states. For the first eight months this year construction totaled \$2,540,000,000, or but 44 per cent of that registered in like 1943 period. Overall construction activity is expected to decline this month, with a sharper reduction estimated for the final 1944 quarter. Total construction for the full year 1944 will reach an estimated \$3.6 billion, or 47 per cent of the 1943 volume.

**WAR EXPENDITURES**—The contemplated 40 per cent reduction in war goods output following Germany's collapse would bring the cost of war from around \$90 billion annually to about \$65 billion. War expenditures were up slightly during August to \$7,798,000,000, an increase of 6 per cent over July. On a daily average basis expenditures rose 2.1 per cent to \$288.8 million last month. From July 1, 1940 to date expenditures totaled \$215 billion.



Index of Manufacturers' Durable Goods

	Orders		Shipments		Inventories	
	1944	1943	1944	1943	1944	1943
January	331.5	293.5	365	208	212.0	211.3
February	294.4	326.6	384	337	208.6	209.6
March	309.7	349.2	369	330	207.2	210.7
April	325.0	329.8	387	338	204.9	213.5
May	351.6	313.0	369	338	204.1	213.5
June	358.9	392.7	378	343	203.6	212.5
July	393.5	338.7	381	346	201.4	211.4
August	...	325.0	...	354	...	213.4
September	...	339.5	...	356	...	214.9
October	...	339.5	...	371	...	214.0
November	...	316.1	...	374	...	213.3
December	...	324.2	...	380	...	212.8
Average	...	332.3	...	339	...	212.7

## FIGURES THIS WEEK

### INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)	96	96	97	99.5
Electric Power Distributed (million kilowatt hours)	4,395	4,228	4,451	4,359
Bituminous Coal Production (daily av.—1000 tons)	1,798	1,929	2,018	1,943
Petroleum Production (daily av.—1000 bbls.)	4,746	4,689	4,675	4,376
Construction Volume (ENR—unit \$1,000,000)	\$42.5	\$25.4	\$42.3	\$43.3
Automobile and Truck Output (Ward's—number units)	20,865	17,285	18,800	21,040

\*Dates on request.

### TRADE

	Latest Period*	Prior Week	Month Ago	Year Ago
Freight Carloadings (unit—1000 cars)	830†	826	887	903
Business Failures (Dun & Bradstreet, number)	23	9	19	30
Money in Circulation (in millions of dollars)†	\$23,495	\$23,432	\$23,020	\$18,773
Department Store Sales (change from like week a year ago)†	+16%	+18%	+5%	+1%

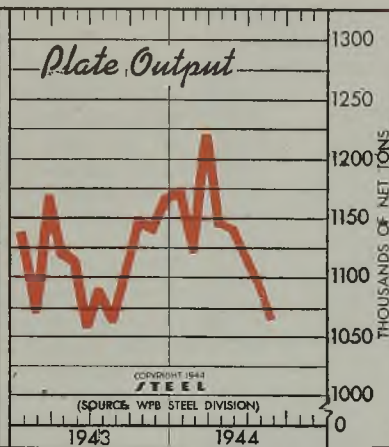
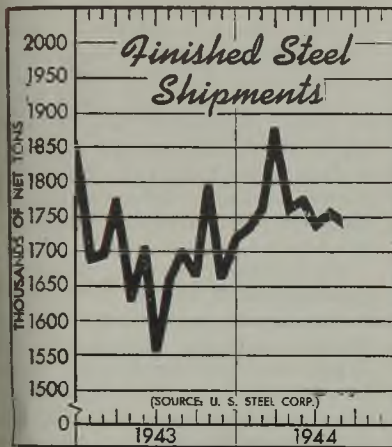
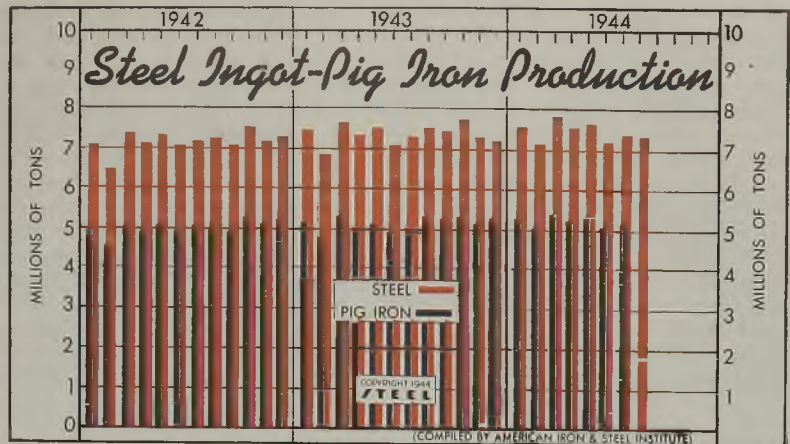
†Preliminary. †Federal Reserve Board.



**Iron, Steel Production**

(Net tons—000 omitted)

	Steel Ingots		Pig Iron	
	1944	1943	1944	1943
Jan.	7,587	7,425	5,276	5,194
Feb.	7,189	6,825	5,083	4,766
Mar.	7,820	7,675	5,434	5,314
Apr.	7,569	7,374	5,243	5,035
May	7,680	7,550	5,343	5,173
June	7,217	7,039	5,057	4,836
July	7,474	7,408	5,157	5,023
Aug.	7,470	7,586	.....	5,316
Sept.	.....	7,514	.....	5,226
Oct.	.....	7,814	.....	5,324
Nov.	.....	7,372	.....	5,096
Dec.	.....	7,255	.....	5,213
Total	88,836	.....	61,777	.....



**Steel Shipments—Plate Production**

(Net tons; 000 omitted)

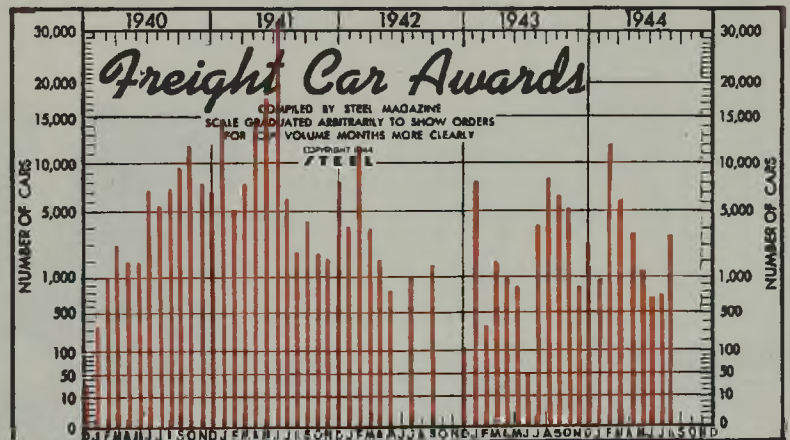
	Shipments		Plate Output	
	1944	1943	1944	1943
Jan.	1,731	1,686	1,173	1,135
Feb.	1,756	1,692	1,122	1,072
Mar.	1,875	1,772	1,223	1,168
Apr.	1,757	1,631	1,142	1,122
May	1,777	1,707	1,132	1,115
June	1,738	1,558	1,112	1,056
July	1,755	1,661	1,093	1,090
Aug.	1,743	1,705	1,066	1,061
8 mo.	14,131	13,405	9,063	8,819
Sept.	.....	1,665	.....	1,106
Oct.	.....	1,795	.....	1,147
Nov.	.....	1,661	.....	1,142
Dec.	.....	1,720	.....	1,169
Total	20,245	.....	13,382	.....

†U. S. Steel Corp. ‡War Production Board.

**Freight Car Awards**

	1944	1943*	1942	1941
Jan.	920	8,365	4,253	15,169
Feb.	12,340	350	11,725	5,508
March	6,010	1,935	4,080	8,074
April	3,819	1,000	2,125	14,645
May	1,352	870	822	18,630
June	750	50	0	32,749
July	765	4,190	1,025	6,459
Aug.	3,600	8,747	0	2,668
8 mo.	28,806	25,457	24,030	71,153
Sept.	.....	6,820	1,868	4,470
Oct.	.....	5,258	0	2,499
Nov.	.....	870	0	2,222
Dec.	.....	2,919	135	8,406
Total	41,355	26,028	121,499	.....

\*Including reinstatements.



**FINANCE**

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	\$9,312	\$8,034	\$4,186	\$10,429
Federal Gross Debt (billions)	\$211.3	\$211.2	\$210.8	\$152.5
Bond Volume, NYSE (millions)	\$30.8	\$34.2	\$27.2	\$59.9
Stocks Sales, NYSE (thousands)	3,644	4,725	4,722	3,655
Loans and Investments (millions)†	\$55,493	\$55,700	\$56,524	\$46,902
United States Government Obligations Held (millions)†	\$41,446	\$41,675	\$42,289	\$34,213

†Member banks, Federal Reserve System.

**PRICES**

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average	\$56.73	\$56.73	\$56.73	\$56.73
Spot Commodity Index (Moody's, 15 items)†	250.1	249.6	250.8	248.0
Industrial Raw Materials (Bureau of Labor index)†	112.8	112.7	114.3	112.2
Manufactured Products (Bureau of Labor index)†	101.1	101.1	101.1	100.1

†1931 = 100; Friday series. †1926 = 100.



ONE of the outstanding developments of the war and one which undoubtedly contributed to turning the tide against the enemy was the development of the gyro stabilizer for guns which enables American tanks to fire accurately while racing across rough battlefields. At tank speeds of approximately 15 miles per hour over typically rough terrain, this device makes possible better than 70 per cent hits over a target range of 1200 down to 300 yards. Without this stabilizer, even experienced gunners are unable to score 1 per cent hits under similar conditions. The device provides a tremendous advantage over enemy tanks which must ordinarily stop to fire.

The very considerable addition to the fund of knowledge about applications for gyroscopic controls and improvements in methods for their manufacture which have resulted from the war are expected to find adequate reflection in redesigning equipment for postwar use. For instance, gyroscopic principles promise to provide "floating" rides in high speed trains, automobiles and other vehicles. Calculations show that only about 3 horsepower are needed to stabilize the vertical movement of a railroad coach.

Stabilizer power and size vary as the mass and the square of the fluctuation. Thus, an automobile and a railroad car

would require about the same size since the excessive vertical vibration of the automobile compensates for its lightness. The railroad and automotive fields are merely typical of the possible applications of the general principles of the stabilizer since such principles are applicable wherever stability is required in a member of a body in action.

The general curiosity which has surrounded the tank gun stabilizer and its future possibilities make a description of its functioning and some of the manufacturing methods involved of particular interest. Up to this time, comparatively little information has been released.

The stabilizer, which is powered by gyroscope small enough to be held in the hand, was invented by Clinton Hanna, manager, Electro-Mechanical Department, Westinghouse Research Laboratories, East Pittsburgh, Pa., and placed in production by J. G. Ritter, section engineer, War Products Department, Westinghouse Electric & Mfg. Co., East Springfield, Mass. Mr. Hanna started

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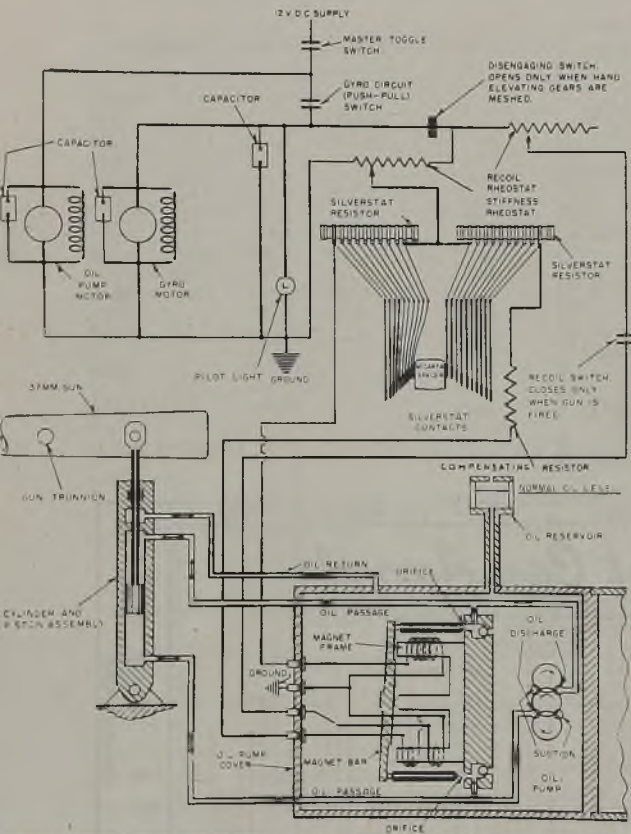
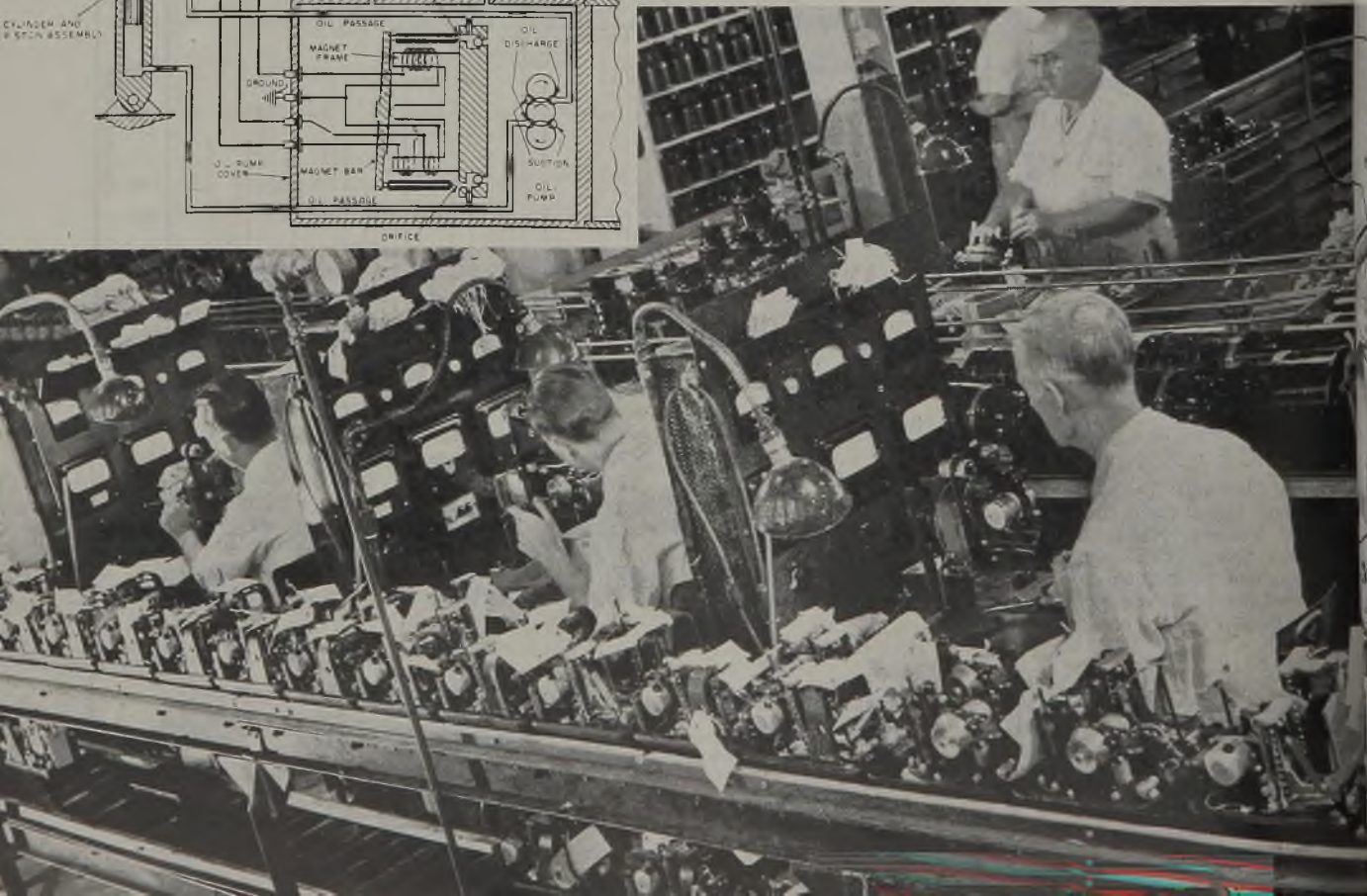


Fig. 1 (Left)—Shown schematically are the details of the gyro stabilizer and hydraulic system controlling tank guns

Fig. 2 (Below)—Gyro stabilizers move along a roller conveyor to test stands for checking spacing and resistance values





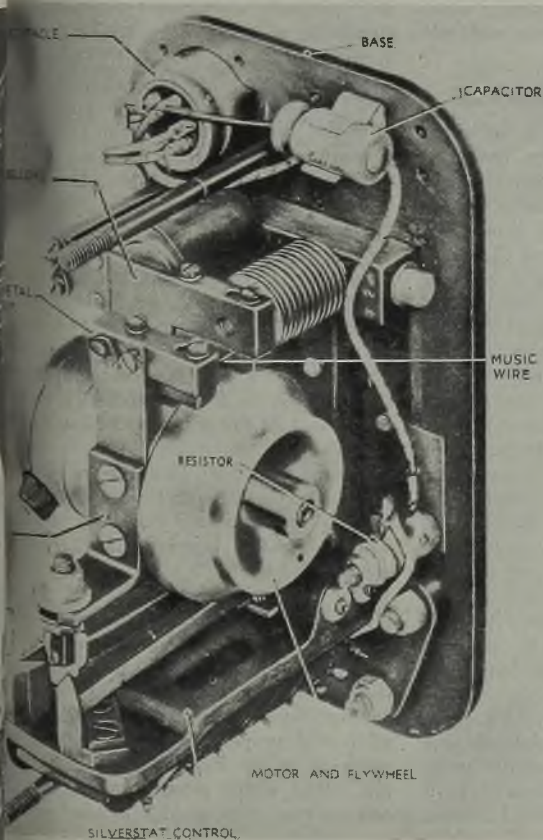
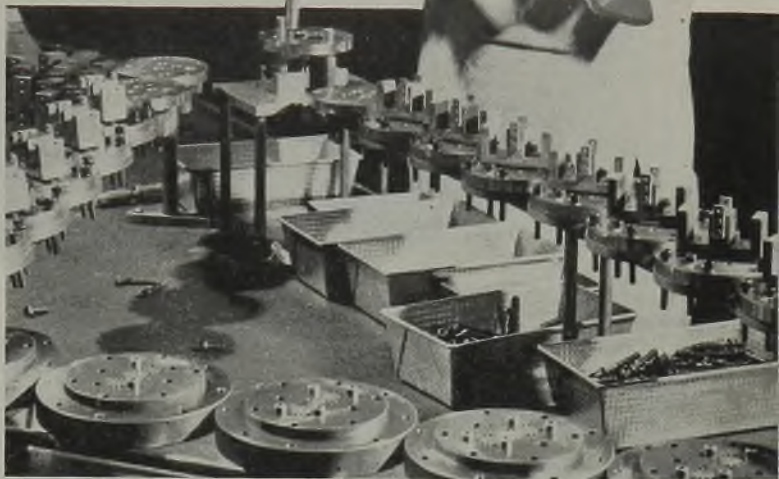
# Stabilizers

... perfected to permit accurate firing of guns while tanks are in motion may provide "floating" rides in postwar high speed trains and automobiles as well as stabilize equipment parts where needed. Gyro actuates hydraulic system supplied by small, 2-way gear pump employing only three gears. All parts machined to extremely close tolerances

Fig. 3 (Below)—This is the gyro stabilizer, previously on the secret list, which permits tank gunners to fire while their vehicle is in motion. The stabilizer actuates a hydraulic system which keeps the gun level despite up and down motion of the tank. Principles involved are likely to be applied to peacetime railroad coaches, automobiles and in many places where stability is required in a member of a piece of equipment in action

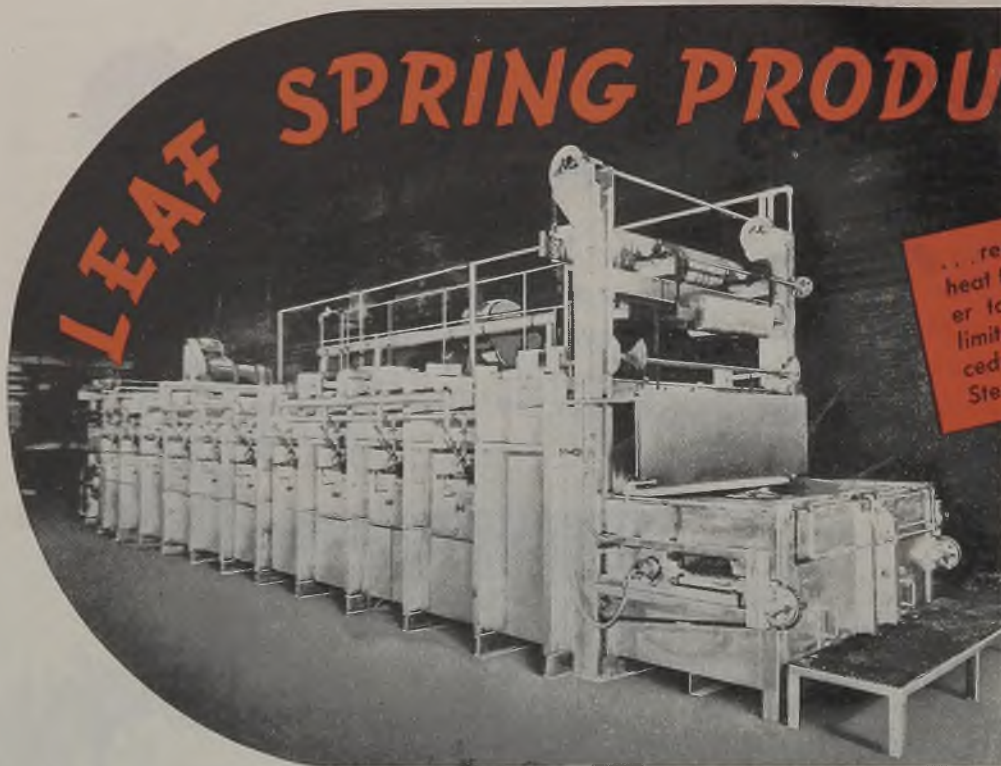
Fig. 4 (Above right)—This operator is assembling the small gear pumps for actuating the hydraulic system. Three small gears actually provide two high pressure pumps in one

Fig. 5 (Right)—Complete gyro stabilizer assemblies are shown here ready for shipment. Units include a meter, pump, gyroscope, gear box, cylinder, cable oil and hardware. Operators are making the final inspection





# LEAF SPRING PRODUCTION



... requires close control over heat treatment; forces designer to stay close to physical limits of material used. Procedure followed by Standard Steel Spring Co. is described



By JOHN ADE

Design and Combustion Engineer  
Stewart Industrial Furnace Division  
Chicago Flexible Shaft Co.  
Chicago

MANUFACTURE of leaf springs requires a precision mass-production heat treatment seldom equalled in any other industrial process. A finished leaf spring must possess very definite physical properties in order for it to stand up under the heavy loads it must carry, and to withstand the fatigue of millions of deflections.

Of great importance in leaf spring design is the matter of calculating the correct physical properties required to meet the spring specifications. In the design of most mechanical equipment it is possible to stay well on the safe side by allowing a large safety factor. However, this cannot be done with leaf springs since the springs would either be too stiff to give the proper deflection or too big to be acceptable from the standpoint of size or cost.

This forces the designer to stay close to the physical limits of the material with which he is working, and to depend upon accurate heat treatment to maintain the narrow safety margin he is able to allow himself. The heat treatment of leaf springs allows for practically no variation either way from the close limits within which the final physical properties must come in order to give the best results. If the spring is a bit too hard, it will fail in fatigue, and if it is a bit too soft, it will take a permanent set under a heavy load.

Another reason for exactness in heat treating leaf springs is the fact that if a spring is defective, the defect will soon become evident. Many items which are

heat treated never become subjected to the extreme conditions for which they were designed, but a leaf spring is constantly at work, and is always subject to severe shocks. The very nature of their task is a thorough test of their ability to take the heavy pounding and to endure the continuous strains for which they were designed. The only way to avoid trouble is by making every spring meet specification regardless of how difficult that job might be.

### Each Leaf Must Meet Specifications

Not only must the spring as a whole have the proper characteristics, but each leaf must be just right. Each leaf plays a distinct part in the way the complete spring reacts, and furthermore, if any leaf does not carry its own share of the load, it places on the other leaves a load, in type as well as in magnitude, which they cannot be designed to withstand. Failure of the complete spring quickly follows the failure of even the smallest leaf. This relationship of the individual leaves of a complete spring is so close that comparatively slight variations in heat treatment of the several leaves can cause complete spring failure even though each leaf in itself was within the overall limits in its physical properties. The only way to be certain of perfect springs is not only to keep all work within the narrow allowable range of heat treating variation, but also of equal importance to maintain absolute uniformity of the individual leaves of each complete spring.

The problem of getting uniformity in heat treating leaf springs is difficult due to the size of the spring and the great variation in length of the leaves in a single spring. Leaves vary from less than

a pound to about 200 pounds in weight and from about 6 inches to 6 feet in length. In one complete spring the leaves may vary from 1 foot to 6 feet in length. A considerable amount of the possible variation is avoided by running all the leaves of each spring through the heat treating process at the same time. However, only an unusually well-designed and properly operated furnace can be depended upon to make 6-foot leaf uniform from end to end and to give a 6-foot leaf the same physical qualities as a 6-foot leaf. The furnace must maintain the temperature within very close predetermined limits and provide absolutely uniform conditions throughout.

Standard Steel Spring Co., for many years prominent in the heat treating of metals, and a prior user of Stewart furnaces, has recently added to its furnace equipment by purchasing Stewart hardening and draw furnaces for two plants to meet its increased production schedules for leaf springs. Accompanying photographs show the installation of this equipment in the company's New Castle, Pa. plant.

In one plant, both furnaces are oil-fired and in the other plant, the hardening furnace is gas-fired and the draw furnace has combination burners so either oil or gas can be used.

The hardening furnaces (Fig. 1) are direct-fired conveyor type with five strands of heavy cast alloy roller chain for the conveyor. The chains are run through the furnace on cast alloy guides which are supported on special hollow tile which allow the proper circulation of the hot gases to insure thorough, uniform heat treating. The chain returns to the charge end on cast alloy guides located on the



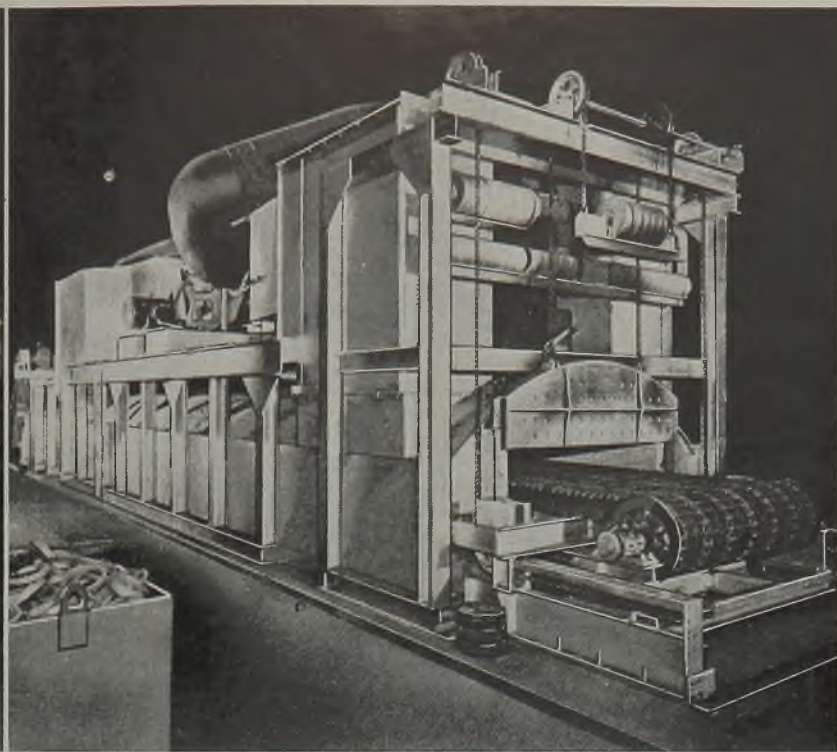


Fig. 1 (Left, opposite page)—Hardening furnace for treating leaf springs in the New Castle, Pa. plant of the Standard Steel Spring Co. is of the direct, oil-fired type. Quench tank is located at the discharge end of the furnace with a draw furnace next in line

Fig. 2 (Above, left)—The draw furnace is equipped with a variable speed transmission permitting regulation of conveyor speed so that springs may be soaked the proper length of time

Fig. 3 (Above)—The draw furnace is shown here from the charging side. The conveyor is fabricated from 7 strands of drop-forged links

Fig. 4 (Below)—This closeup of the draw furnace from the charging side shows the dividing arch which separates the two combustion zones. The return outlet for recirculated gases is located in the center of the arch just within the door opening. Two more return outlets are located beyond the dividing arch

floor of the furnace. The vents are located all along both sides of the furnace walls below the level of the work and just above the returning chain so that the circulation is through the work and the chain is kept hot in both directions.

Due to the variation in length of the work passing through the furnaces, the five chains are spaced with two chains close together on each side and one chain in the center. The chains are designed to provide a 6-foot wide carrier surface. Leaves up to 18 inches long are carried by the two outside chains. Leaves from 16 inches to 36 inches long are carried by the two outside and the center chain, and longer leaves are carried across all five chains.

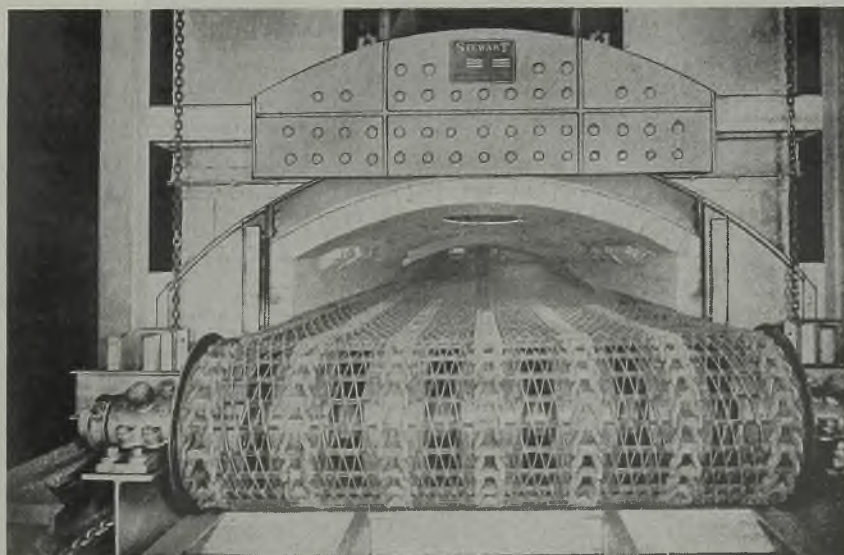
#### Furnace Has Three Combustion Zones

A heavy cast alloy shaft and sprockets provide a positive drive, and a variable speed transmission gives the flexibility required to handle the wide range of work to be heated. Water-cooled, self-aligning bearings of special design are used on the drive shaft, and on the take-up end the entire shaft is water cooled. For the comfort of the operators who load the spring leaves onto the conveyor chain, water-cooled shields and aprons are provided.

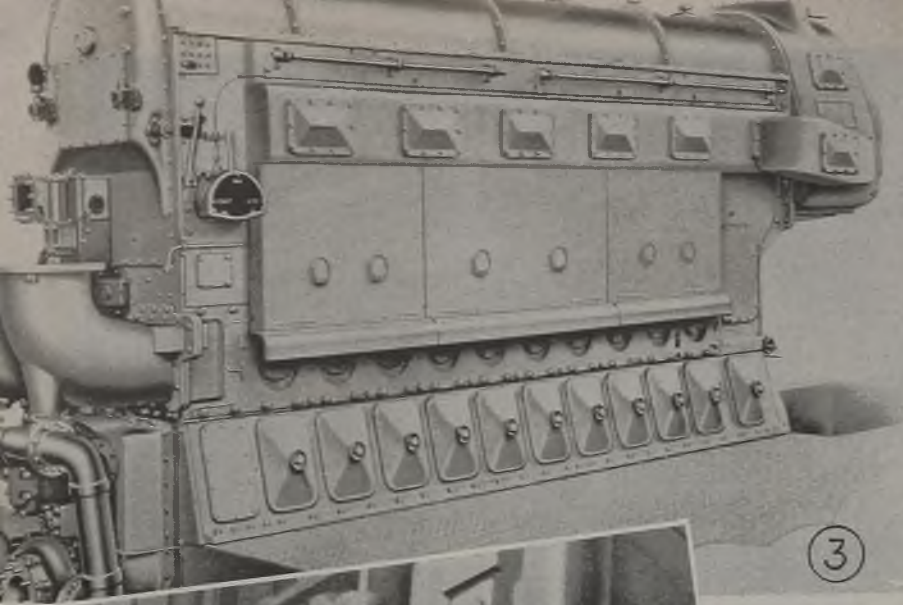
Nine inches of insulating fire brick lining backed up by 4½ inches of insulating brick help provide the utmost in fuel economy. The furnace is divided into three combustion zones, with each zone fully equipped with throttling type temperature controls and fuel-air proportioning valves.

The leaves are placed upon the chain on edge in about the same relative posi-

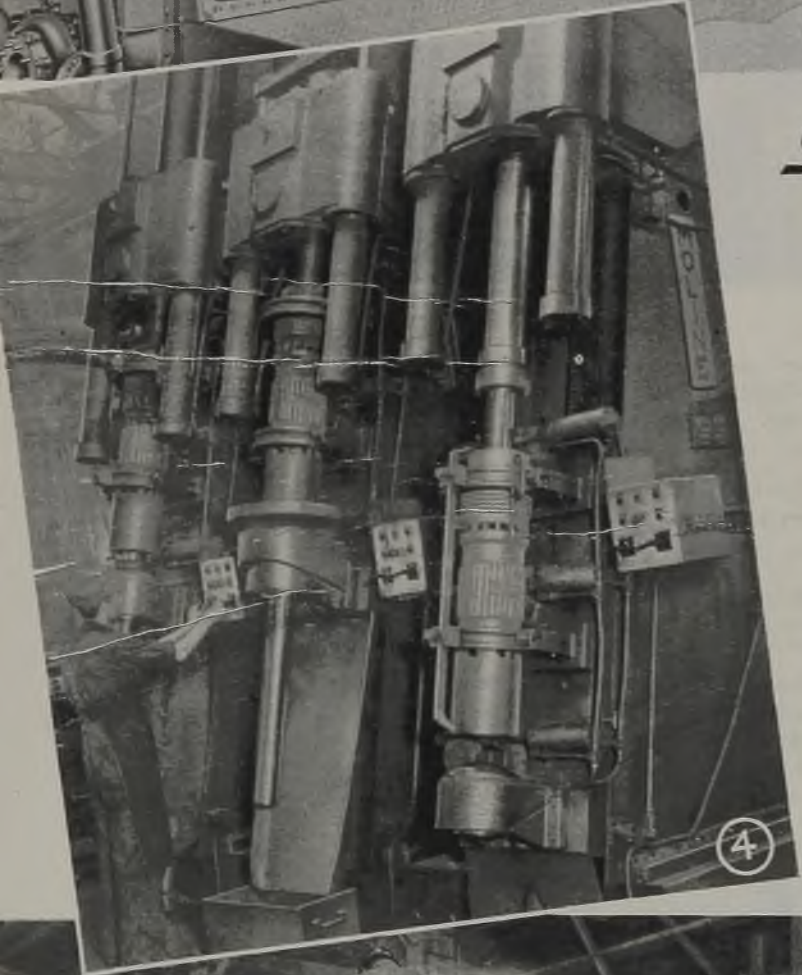
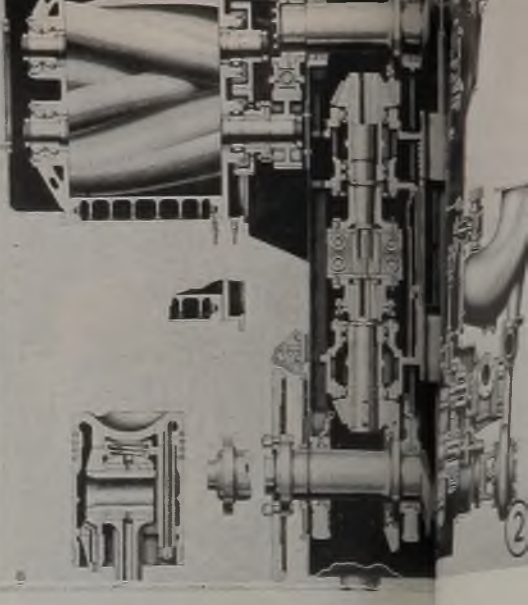
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3



# Improved product techniques POSE

Fig. 1—Multiple automatic flame cutting plates for engine frame

Fig. 2—Sections show prominent features: Opposed pistons, gears connecting upper and lower crankshafts, positive blower. Lower left is section through piston

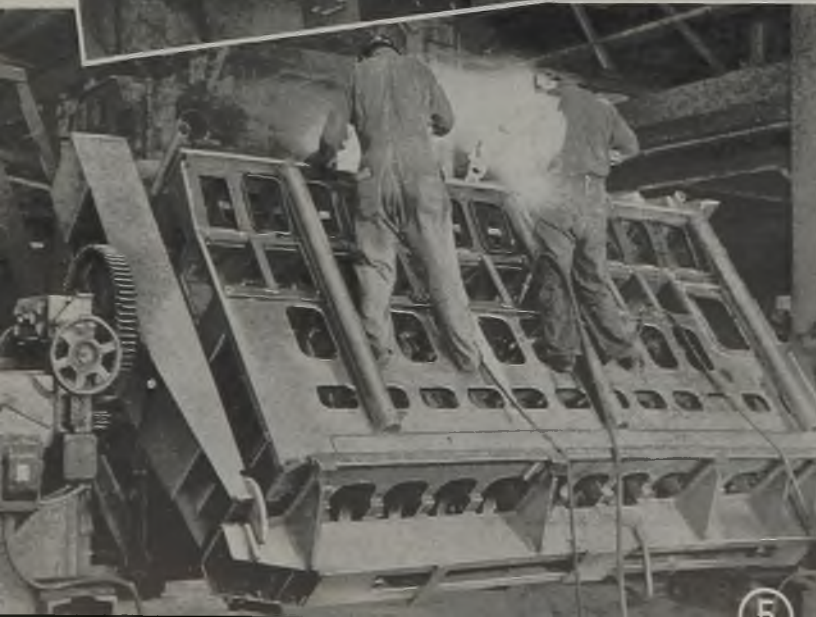
Fig. 3—Control side view of 10-cylinder opposed-piston diesel as made by Fairbanks, Morse & Co.

Fig. 4—Large boring machine for cylinder liners

Fig. 5—Frame on positioner being fabricated by arc welding

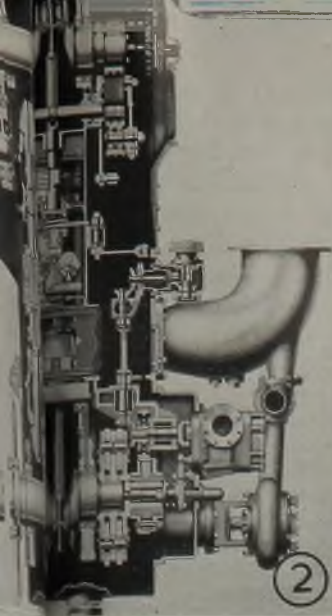
Fig. 6—Planer type milling machine working on engine frame

Fig. 7—Heavy duty planer machining surfaces of engine frame



the opposed-piston  
a new design, its  
production is new  
Chicago, over a  
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were built. A  
by the Southern P  
in multiple-car die  
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engines were  
with rollers fly  
vements were rec  
"OP" became better  
technique was  
the important step





## Techniques employed in turning out **OPPOSED-PISTON DIESEL ENGINES**

WHILE the opposed-piston diesel engine is not a new design, its development or mass production is new. Fairbanks, Morse & Co., Chicago, over a decade ago, started the design of this now-famous diesel, primarily for railroad use. A number of engines were built. A half-dozen were taken by the Southern Railroad System for use in multiple-car diesel-electric trains. All performed with great satisfaction.

Then along came the submarine building program and the "OP" (opposed piston) was recognized as ideal for that duty. Several engines were tested and came through with colors flying. Some few improvements were recommended and the "OP" became better and better as manufacturing technique was improved. Some of the important steps in manufac-

ture of this type of engine are shown in the accompanying illustrations.

War demands ruled out availability of this engine for railroad and industrial use. But the exacting services demanded in its application to sea duty, helped to develop an improved engine which can again fit into other mobile applications.

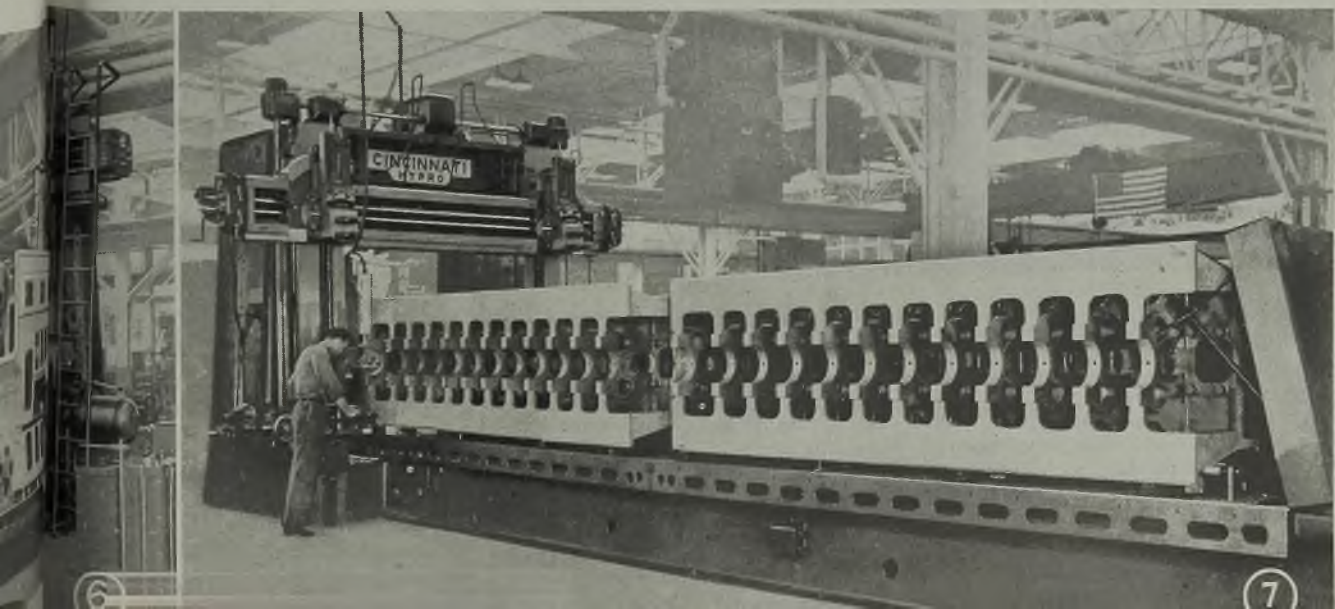
Underlying principle of the 2-stroke cycle opposed-piston diesel engine is the use of a plain open-ended cylinder in which combustion takes place in the center of its length between two pistons which move away from each other, and in doing so uncover the exhaust and air inlet ports, thus eliminating all valves. The pistons controlling the air inlet ports are connected to the upper crankshaft while those controlling the exhaust ports are connected to the lower crankshaft,

the two crankshafts being mechanically connected by means of a vertical shaft and bevel gears thereby transmitting power from the upper to the lower shaft and maintaining the proper timing between the upper and lower pistons.

In reality, therefore, with a pair of pistons in each cylinder, the 10-cylinder engine becomes a 20-cylinder engine. The engines are made in various sizes having from 3 to 10 cylinders and ranging from 150 to 2000 horsepower.

The many inherent advantages include compactness, simplicity and economy. One of the principal contributing factors to its enviable reputation for economy is the unidirectional flow of scavenging air.

Cycle of operation begins with the movement of the pistons from their outer





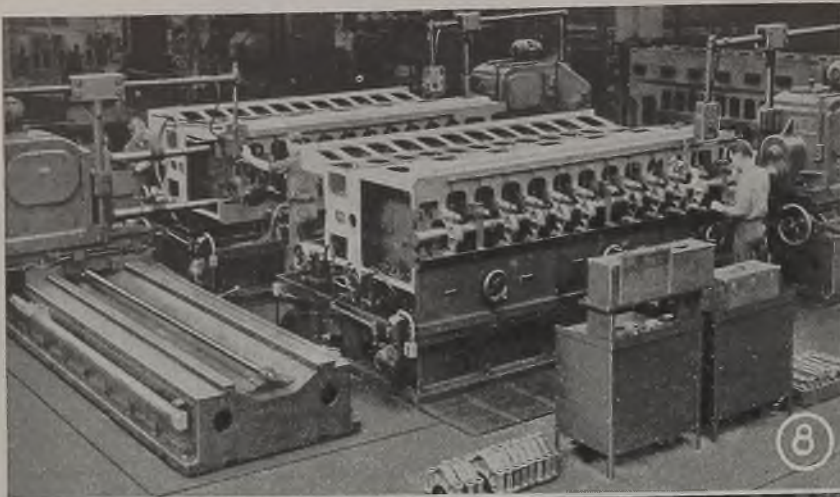


Fig. 8—Special setup for boring crank and camshafts. Note three working heads

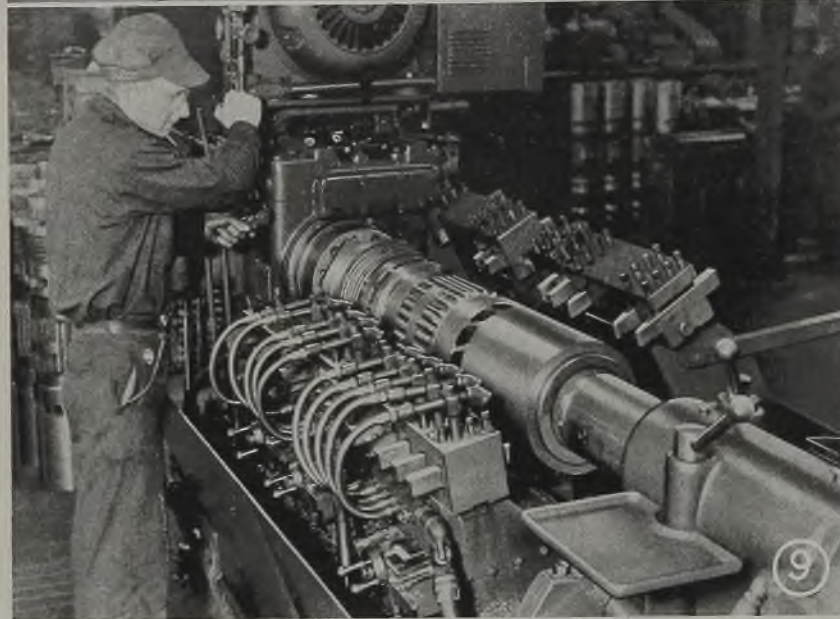


Fig. 9—Multiple tool setup for machining cylinder liner on lathe

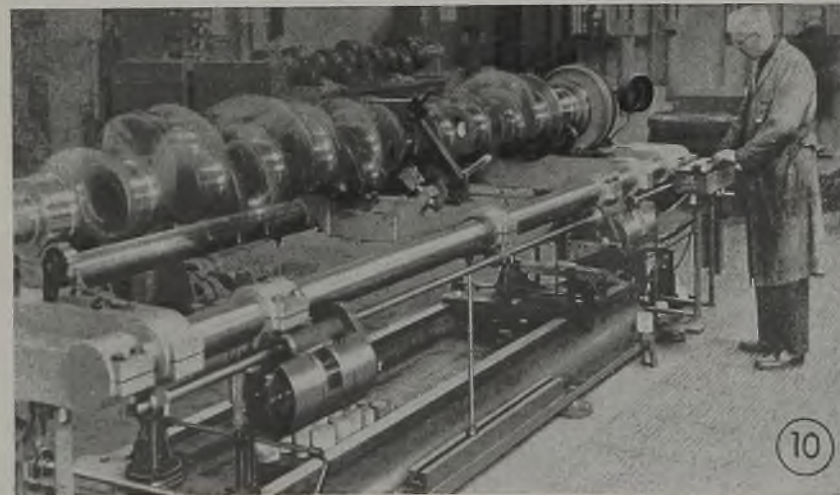


Fig. 10—Double-compensator machine for dynamic balancing crankshafts

Thus during but one revolution of the crankshaft, compression, injection, combustion, expansion, exhaust and scavenging takes place.

The engine is a complete self-contained unit with attached rotary type blower, and pumps for fuel, lubricating oil and water. The main frame or cylinder block is of welded construction. Both crankshafts are made from chromium-nickel-molybdenum alloy and the bearing surfaces are ground and polished to provide a perfect wearing surface.

Both shafts are supported in the main frame by removable bearings between each cylinder and at each end. Connecting rods are one-piece steel forgings fitted with removable wristpin bearings and removable crankpin bearings.

Scavenging air blower is of the multiple spiral lobe, positive displacement type, driven from the upper crankshaft by means of helical gears. Timing of the impellers is positively maintained by precision gearing.

The governor is of the hydraulic type and controls the quantity of fuel delivered by the injection pumps to the fuel injection nozzles. A rotary type fuel supply pump delivers fuel from the service tank to individual fuel injection pumps for the two injection nozzles in each cylinder.

## Reports Conveyor Records

"Case Histories—To Aid You In Blue printing For Peace" is the title of a new booklet by Lamson Corp., Syracuse 1 N. Y. By citing case histories, improved methods of handling materials are analyzed, with results and postwar applications. Many different types of industrial conveyor systems are discussed, including use of tubes. Another booklet, "Co-ordinated Control," also is available without charge.

## Glass Tape Insulates New Storage Battery

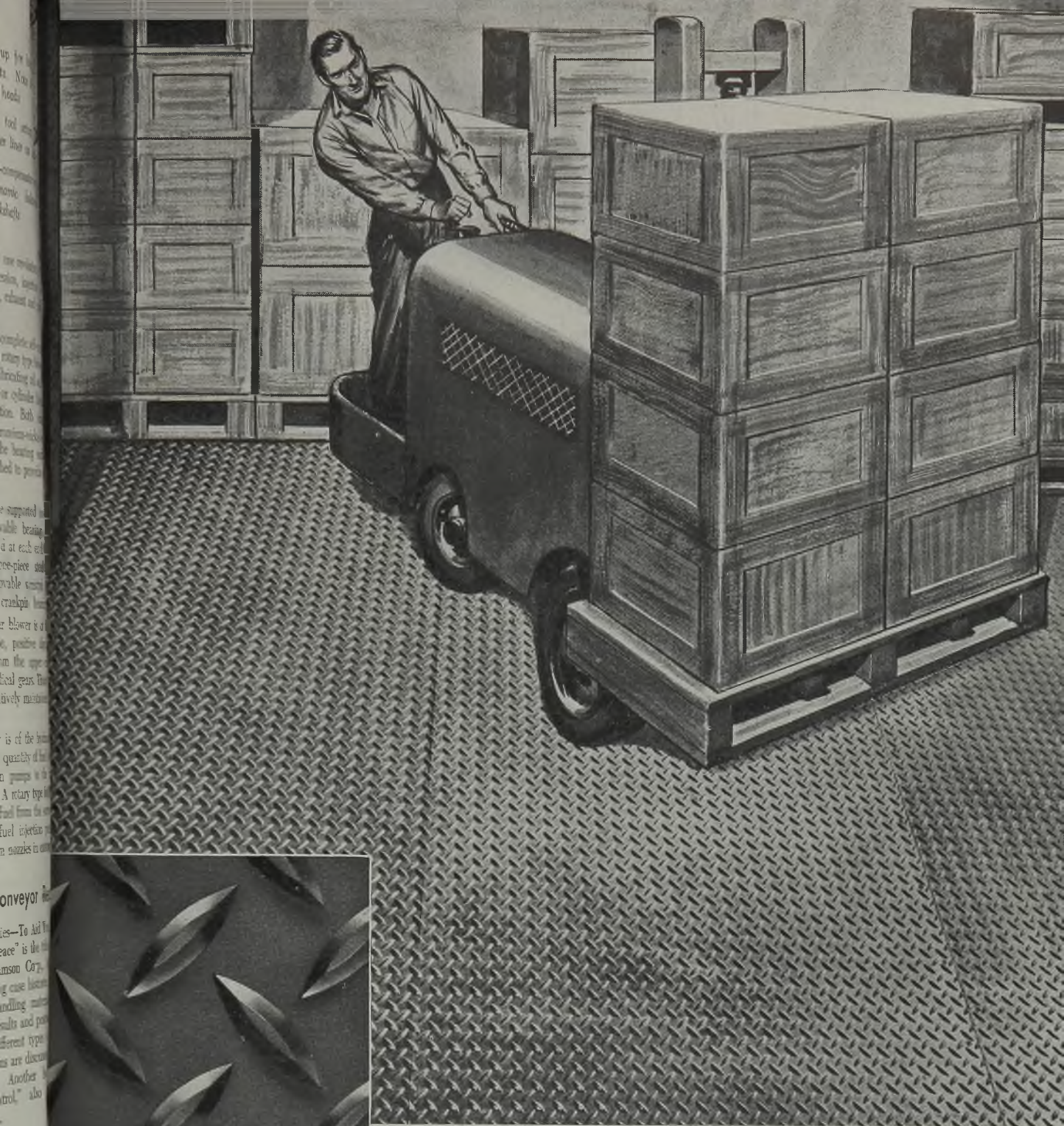
A new industrial truck storage battery incorporates fabricated glass tape insulation to lengthen service life of positive plates. Glass mats have been replaced with a tape jacket completely encasing the plates. The tape is wrapped in a double layer, one horizontal and the other vertical, with overlap to assure homogeneous film. By complete encasement, the rate of grid peroxidation is stated to be materially decreased. A 80 per cent longer life is claimed for this battery, the Philco Thirty, made by Philco Corp., Trenton 7, N. J.

dead centers. After pistons have covered the exhaust and air inlet ports, air between the pistons is compressed. As they approach inner dead center, fuel is injected into the combustion space where the heat generated during compression of the air ignites the fuel. Combustion and resulting expansion forces the pistons outward on the power stroke, thereby deliv-

ering work to the crankshafts.

The burning and expanding of the gases continues until near end of power stroke. At this point, lower piston uncovers exhaust ports allowing the burned gases to escape. Upper pistons next uncover the inlet ports, and air supplied by the blower rushes into the cylinder to clean out all burned gases.





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# METALLIC ARC WELDING ELECTRODES

*Excellent joints in cast parts can be made through proper selection of one of several arc welding methods although poor ductility of cast iron has often led welding engineers to approach such jobs with considerable caution. Five types of electrodes may be used. Nickel and nickel alloy electrodes will be discussed next week*

By HAROLD LAWRENCE

Metallurgist and  
Welding Engineer

ONE of the more difficult fields of metallic arc welding is that of cast iron. Whereas the excellent balance of mechanical properties in steel makes the welding of this material almost foolproof, the poor ductility of cast iron makes the average welding engineer approach such jobs with considerable caution. However when the peculiarities of cast iron welding are kept in mind, there are several welding methods that will lead to good welded joints.

Before undertaking a description of the five groups of cast iron electrodes, a short discussion of the chemical, physical and metallurgical makeup of cast iron ought to be profitable. Primary chemical constituents of cast iron, other than the iron itself, are carbon which ranges from 2 to 4 per cent and silicon which runs from 0.50 to 3 per cent. Keeping in mind the influence of carbon on the welding of steels, it is quite apparent that the very high carbon content of cast iron will cause some metallurgical problems.

Strengths of cast irons may be as low as 20,000 pounds per square inch or may run up to 60,000 or more. Foundrymen are incorporating many innovations in cupola practice which are bringing a fair degree of ductility to their irons along with strengths that are going far to free cast iron of the limiting engineering restrictions that have prevailed heretofore. This discussion, in order to add a margin of safety, will discuss methods and procedures involved in the welding of ordinary gray iron with the understanding that these same practices may be carried over into the welding of the newer irons and semisteels. Therefore, cast iron will be classified as a material possessing poor ductility.

The metallurgical structure of cast iron is usually pearlite with free flakes of graphite representing the excess carbon

over that necessary to a pearlitic structure. Or the matrix of cast iron might be ferrite with excess graphite—this is not a common structure for modern cast irons.

Above 1300 degrees Fahr. the combined carbon in the pearlitic matrix breaks down to ferrite and graphite with some change in volume and a decided

loss of strength. Near the melting point carbon is reabsorbed. Cooling of welds and the adjacent affected metal frequently leads to the formation of hard and brittle structures because of the high carbon content of the material involved. For several reasons, therefore, preheating and slow cooling are vital considerations in the welding of cast iron; namely: (1) to control the volume changes in a metal of limited ductility; (2) to slow the cooling rate to avoid the formation of hard and brittle combinations of iron and carbon; and (3) to provide a measure of stress relief in order to avoid overstressing a material unable to stretch to iron out differences in stress.

Five distinct types of metallic arc electrodes are available for the welding of cast iron. As shown in Table I these electrodes are cataloged according to the type of core wire employed in the manufacture. Of course this type of identification applies equally well to the kind of deposit which is, after all, a direct function of the core analysis. So cast iron electrodes contain one of the following cores: low carbon steel, cast iron, monel or nickel, copper alloy or a composite wire generally built up of steel, copper and nickel. The cast iron electrodes will be reviewed individually.

Cast iron electrodes with a mild steel core wire are most common, but this does not mean that they are the best. Rather the best iron electrode is the one that furnishes the most suitable properties for the application at the lowest cost.

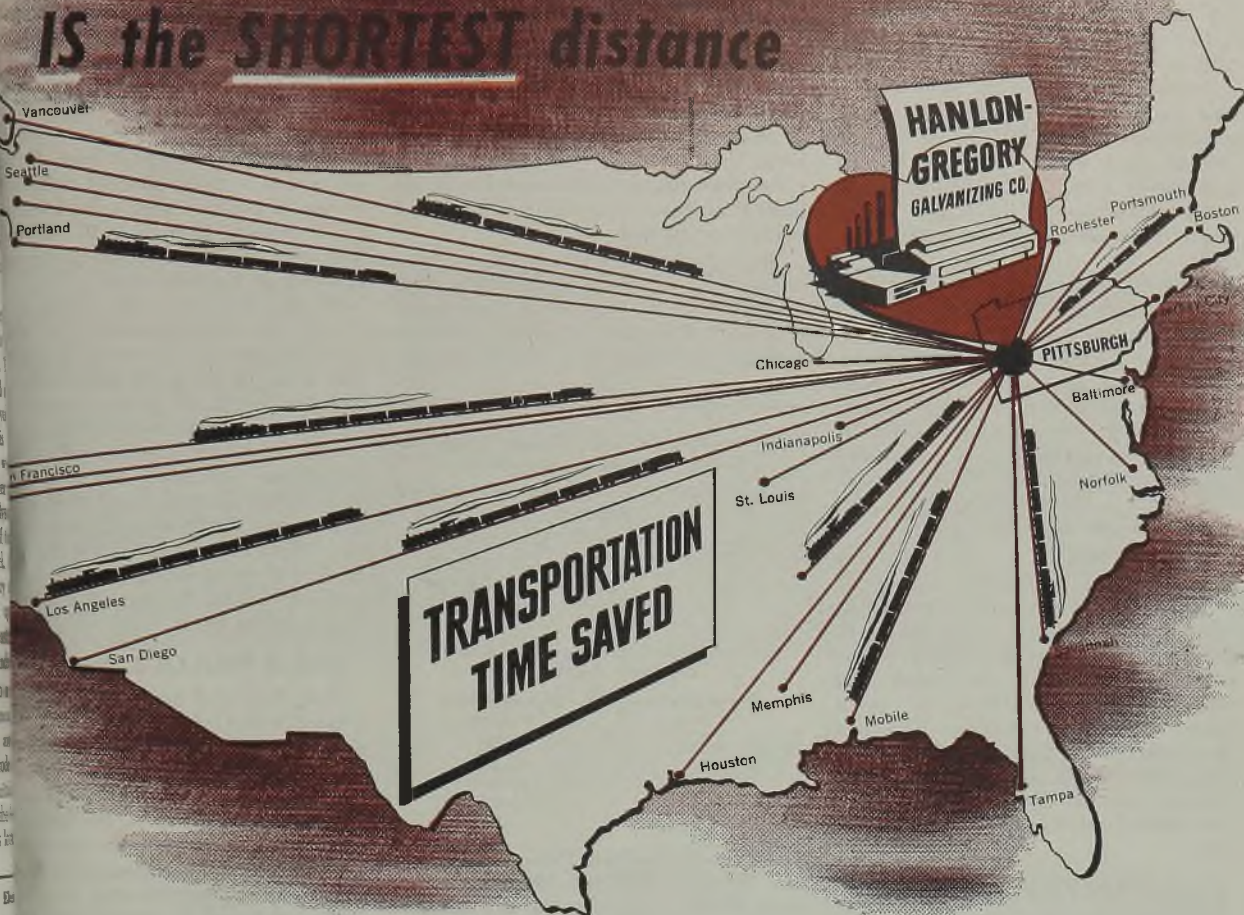
This group of electrodes looks like a

Table I—Manufacturers and Types of Cast Iron Metallic Arc Welding Electrodes

Manufacturer	GROUP A Low Carbon Steel Core	GROUP B Cast Iron Core	GROUP C Monel or Nickel Core	GROUP D Copper Alloy Core	GROUP E Compo Core
Air Reduction Sales Co. 60 E. 42nd Street New York 17	Aircro No. 77				
American Agile Corp. 5806 Hough Ave. Cleveland 8			Agile Yellow		
Ampco Metal Inc. 1745 S. 38th Street Milwaukee 4				AmpcoTrode 10	
Arcos Corp. 401 N. Broad Street Philadelphia 8	Reformend		Mixend		
Champion Rivet Co. Harvard at East 108th Street Cleveland 5	Non-machin- able Cast Iron	Machinable Cast Iron			
Eutectic Welding Alloys Co. 40 Worth Street New York 13		EutecTrode 24B	EutecTrode 24		
General Electric Co. 1 River Road Schenectady 5, N. Y.	Type W-83				
Hollup Corp. 4700 W. 19th Street Chicago 50	C.I. 8	C.I. 22	6723-C	Grade 20 Grade 20B	
Lincoln Electric Co. 12818 Coit Road Cleveland 1	Ferroweld		Softweld		
A. O. Smith Corp. Milwaukee 1	SW5	SW 301			
Universal Power Corp. 4900 Euclid Avenue Cleveland 3	Cast-Iron- Arc R	Cast-Iron- Arc B	Cast-Iron- Arc Y	Brazarc	
Westinghouse Electric & Mfg. Co. E. Pittsburgh 30, Pa.	Castingweld		Freemachin- weld		
Wilson Welder & Metals Co. 60 E. 42nd Street New York 17		Wilson No. 97			



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other common steel metallic arc electrode. It is heavily fluxed with a coating designed to give outstanding arc stability with the extremely low currents desired for cast iron welding. Likewise the coating has a low melting temperature to further aid in the use of low current values. Slag formed from this coating is readily removed from the weld deposit. And the weld metal produced is both smooth and uniform in contour to provide an even union of the weld metal and parent metal without any abrupt change in section at the fusion line as might be found with an uncoated electrode.

Since the weld metal formed by electrodes of this type is essentially steel, it is not surprising that a rather high carbon steel results because of the carbon dissolved out of the cast iron when filler metal and parent metal mix in the fusion area. Cooling rates are generally such as to form a hard weld deposit and a hard heat affected zone both of which mean that welds made from electrodes using a steel core are unmachineable.

Because steel does not match cast iron in appearance, deposits from this group of electrodes will not match the color of cast iron. As a matter of fact this same statement may be made of four of the five electrodes as only one classification uses a cast iron core and produces a metal similar to that being welded. The steel deposit is stronger than the cast iron and fuses well with it. Because of the low currents permitted by the stable coating, heat affected zones are of minimum thickness.

#### Surface Should Be Clean

Alternating current and direct current, either polarity is suitable. Here, too, manufacturers' recommendations must be followed if best results are to be obtained. There is some difference of opinion among the advocates of straight and reverse polarity when direct current is used. Some engineers feel the lesser penetration of straight polarity is desirable while others maintain that deeper penetration is essential to satisfactory fusion. As is often the case, good welds are made under either condition.

Since the heat input in cast iron welding is best held to the lowest possible value, Group A electrodes are available in small diameters only. Some manufacturers make the 1/8-inch diameter only while others make sizes from 3/32 to 3/16-inch inclusive. Suggested current ranges and correct voltage ranges are given in Table II.

As is common to practically all fusion welding applications, the surface to be welded should be clean. Any oil or grease should be removed either chemically or by burning away with a flame. If the welding is being done to repair a crack, the crack should be thoroughly chipped or ground out leaving a groove for the weld metal. Sometimes a small hole is drilled just beyond either extremity of the crack to prevent further propagation. It is advisable to make sure that all of the crack has been removed by checking

with magnaflux or a penetrating oil and whitewash before starting in to weld. Studding has been a common practice in large repairs.

Usually Group A electrodes are used with a "cold" welding technique. No more current is used than is necessary to the deposition of a smooth, well fused bead. Short bead increments are best with no bead running more than 3 inches in length. Skip welding is suggested to keep the parent metal cold. Curved, rather than straight continuous beads, are best. Each bead should be lightly peened while it is still hot.

Some electrodes in this group are more affected by atmospheric humidity than others but a cool, dry storage space ought to keep the coating in prime condition. Extremes of temperature should be pre-

Table II—Current and Voltage Ranges for Group A Electrode Applications

Size of Electrode Inch	Recommended Amperes	Recommended Volts
3/32	60-95	19-23
1/8	80-110	20-24
5/32	110-150	21-25
3/16	130-180	22-26

Table III—Current Ranges for Group C Electrode Applications

Size of Electrode Inch	Recommended Amperes
3/32	60-80
1/8	80-100
5/32	120-180
3/16	180-250

Table IV—Current and Voltage Ranges for Group D Electrode Applications

Size of Electrode Inch	Recommended Amperes	Recommended Volts
1/8	80-100	25-28
5/32	110-130	25-28
3/16	130-160	27-30

vented. Fresh electrodes give the best performance and it is suggested that inventories keep pace with use. A softened coating may indicate excess moisture.

Although the majority of group A electrodes deposit a steel weld metal, there is one variety that produces a cast iron deposit because of coating additions. This coating is largely graphite with a small amount of barium carbonate and the rest carborundum with all ingredients bound together and to the core with the usual silicate binder solutions.

There are many applications of Group A electrodes for welding cast iron with a partial list covering cylinder blocks, cylinder heads, bearing blocks, machine parts, large frames, machine bases, cast boiler sections, headers, cast iron wheels, diesel water jackets, tractor transmission cases, tractor differentials, compressor blocks, steam radiator sections, gear teeth, welding cast iron to steel, lamp posts, fire plugs, pulleys, wheels, casting repairs such as blow holes, sand cavities, etc., printing press and drying rolls and valves.

Group B electrodes are those with the coating surrounding a cast iron core. There are several analyses of core wire

used and the analysis establishes the preheating phase of the welding technique. One group of analyses requires a preheat of 1000 degrees Fahr. in order to make a machineable weld in cast iron while the other group has a chemistry balanced to permit good machineable welds with a preheat temperature of only 300 degrees Fahr. Manufacturers' recommendations will furnish a clue to the type of analysis employed.

Deposited weld metal from Group electrodes is a fine grained cast iron, is free of porosity with a hardness of 10 to 20 rockwell C or 87 to 97 rockwell B. The heat affected zone should be as machineable as the deposit.

As was the case with Group A electrodes, the casting should be cleaned prior to welding. Grinding is suggested and a vee of 60 to 90 degrees including angle is best suited to the application of the cast iron weld metal. Next the section to be welded is preheated to 300 degrees Fahr. And finally the weld is made with 1/8-inch electrodes at 150 to 175 amperes using direct current, reverse polarity. With this electrode best results will be had if the welding is done hot but slight delay between the deposition of successive layers.

#### Group B Welds Light, Heavy Castings

Both light and heavy castings may be welded with Group B electrodes. Should a light section be joined to a heavy section, it is advisable to put most of the heating work on the heavy section. This will prevent cracking of the heavier section which because of the mass cooling action associated with heavy metal sections might otherwise cool too rapidly. Welds of Group B classification may be machined at surface speeds up to 65 feet per minute if the welding has been correctly accomplished.

The most common constituents of coatings on cast iron electrodes are graphite and silicon with a minor amount of slag formers and all of these materials held together with a suitable silicate binder which also anchors the coating to the core. Both the graphite and silicon, although a number of other elements such as phosphorus, titanium and copper perform similarly, serve to produce gray iron. Graphite permits a high arc temperature while the silicon produces a metal with a lower melting point. In combination the graphite-silicon coating yields an extremely fluid weld metal and permits effective inoculation, despite the short time in which the metal is deposited to provide nuclei for the carbon to precipitate as graphite.

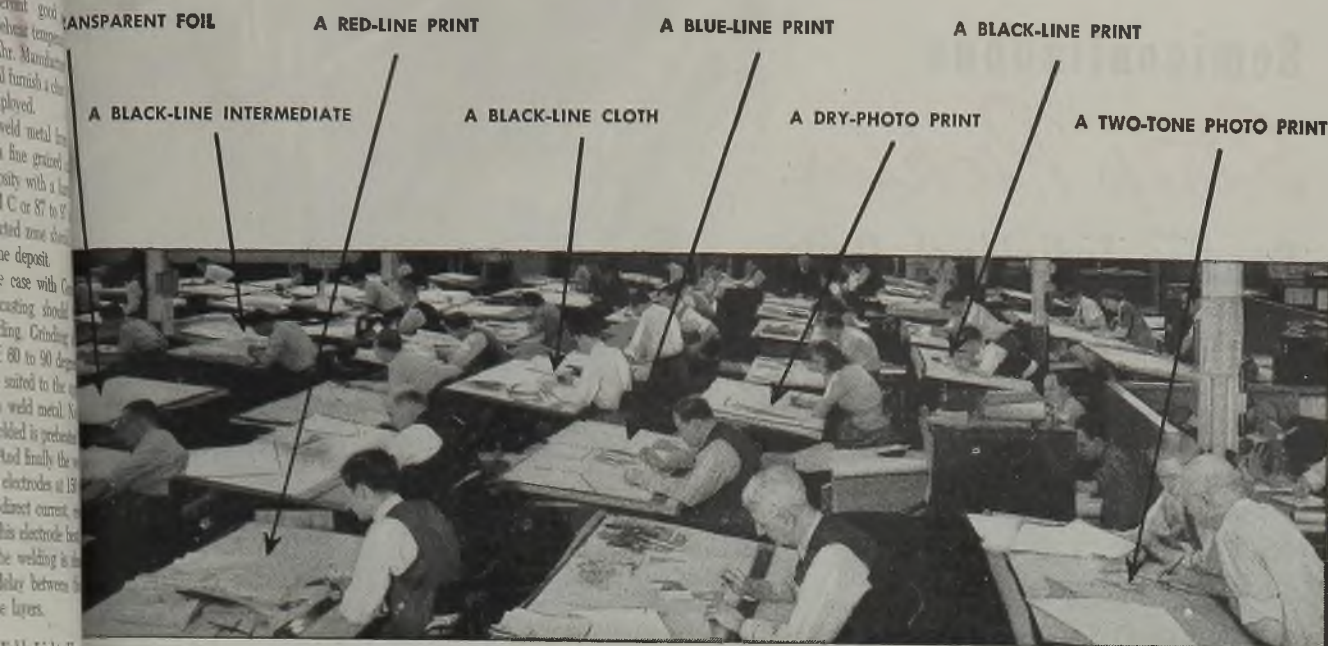
It is the graphitic carbon and the around balance of deposit chemistry that has enabled the electrode maker to furnish a good Group B electrode with weld metal that matches the color and behavior of gray iron quite closely. Alloying may be added to control the tensile strength which can reach 50,000 pounds per square inch with a brinell hardness of 275 which is definitely machineable.

Group C electrodes made with a

(Please turn to Page 130)



# IMPOSSIBLE requests from the drafting room?



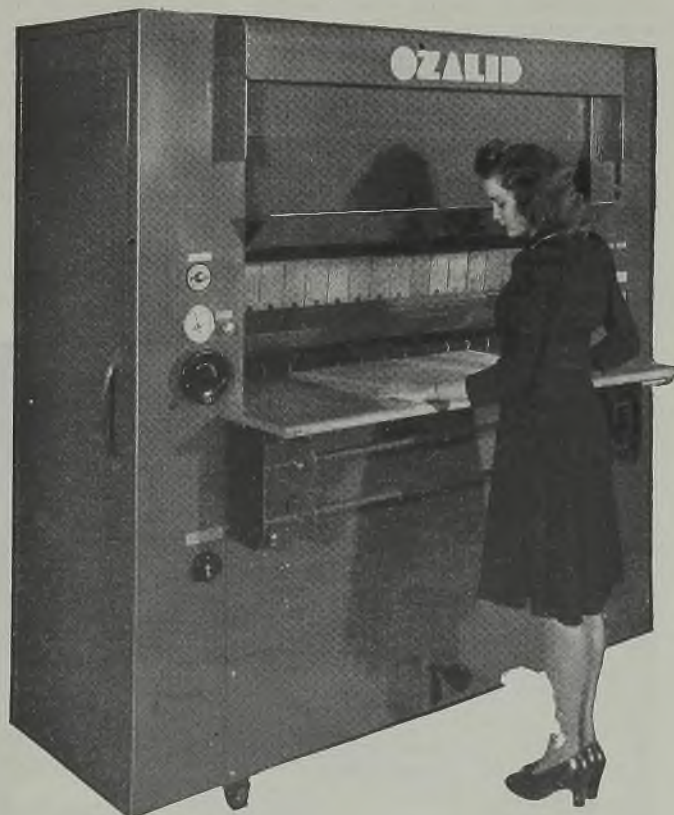
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By C. F. BUENTE  
Sales Engineer  
United Engineering & Foundry Co.  
Pittsburgh

## Semicontinuous *Strip Pickler* Handles Individual Coils

*Elimination of welder or stitcher, looping pits and shear usually found in continuous lines reduces floor space required and minimizes installation, operation and maintenance costs. Quick pickling action secured by immersing the piece in a hot water bath at the front end of line to remove particles of scale and increase temperature of strip*

**SURFACE PREPARATION** of hot strip for reduction on cold mills of the Bopp Steel Corp., Detroit, has been accomplished until recently by tub pickling. Wartime demand, however, necessitated an increased flow of material and to meet this demand, the company installed a semicontinuous pickler which handles widths and gages of hot rolled strip that can be pushed through the various tanks and sprays without welding into a continuous band.

The name "semicontinuous" is derived from the fact that the front end of each coil of strip is pushed through the first tank by the leveler unit from the coil box. At the opposite end of the first tank the strip is picked up by rubber-covered pinch rolls, which in turn feed

the strip through the second tank and so on through the several tanks to the drier and recoiler. This arrangement eliminates the welder or stitcher, looping pits and shear usually required for a continuous-type pickler. Elimination of these units not only reduces the space required, but is reflected in the lower installation cost of the line and in the total operating and maintenance costs.

In the Bopp line, raw coils are placed by the overhead crane on a gently sloping ramp, shown in Fig. 2. Here the tie wires are cut, corners clipped and the coil made ready to roll onto the coil box without delay immediately after the

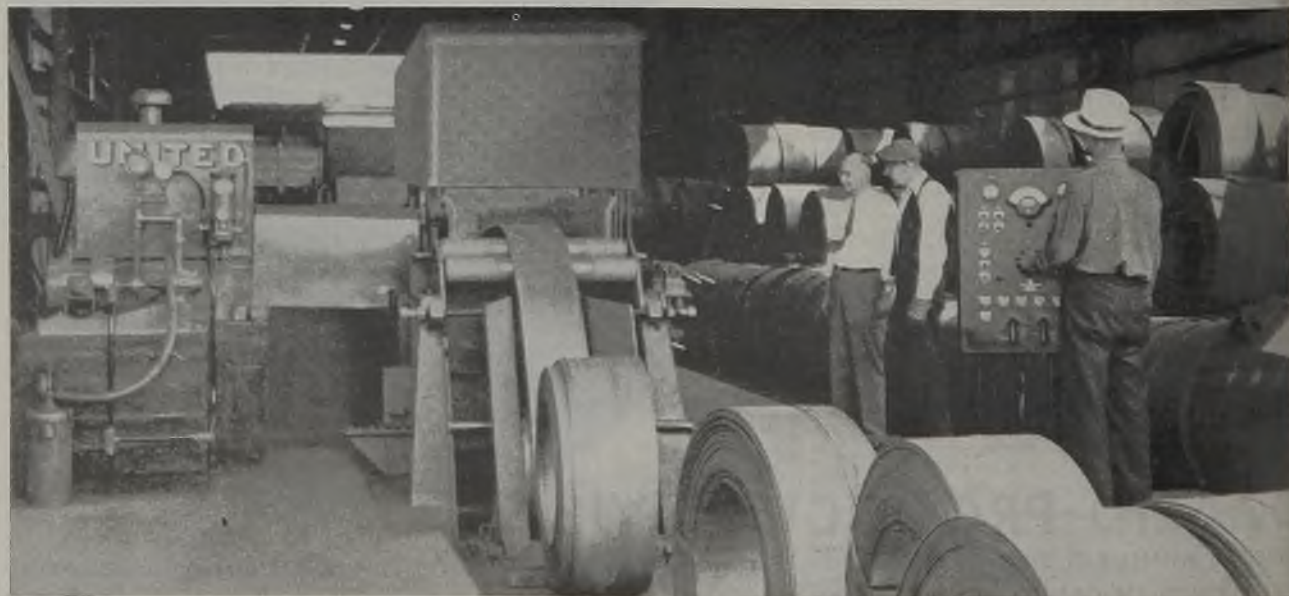
*Fig. 2—Hot strip being fed into the leveler at entrance of the pickling unit*



*Fig. 1 — Exhaust pipe through which fumes are led to the outside is shown at side of building*

tail end of the preceding coil has left the coil box.

The front end of the new coil is fed by hand into a set of wide opening pinch rolls, which in turn when closed feed the strip into a leveler unit. The leveler removes the coil curvature and at the same time tends to break up the scale before the strip enters the first tank. This tank contains a bath of hot water which wets the strip, removes the fine particles of broken scale and raises the strip temperature. The efficiency of this hot water tank has been definitely proven, for the strip entering the acid





## THREE COMMON PROBLEMS IN TOOL PERFORMANCE



WEAR TOO RAPIDLY



NOT TOUGH ENOUGH



HARDENING TROUBLES

Too frequent regrinding of a tool generally indicates the need of a tool steel with greater wear resistance. Down time for tool grinding or replacement cuts production and increases costs.

Tool breakage and crumbling of the cutting edge call for a tool steel with maximum toughness. Production time is lost and tool cost increased by tool replacement.

Hardening troubles such as cracks, excessive size change and warpage indicate the need for a steel that gives greater hardening accuracy and safety.

# Carpenter MATCHED TOOL STEELS

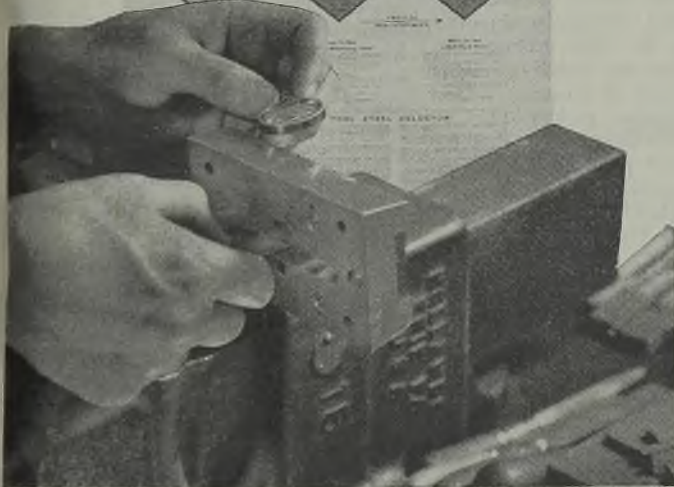
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If you trace your tool failures with resulting idle men and machines, together with increased tool making costs, you will find that they are usually due to the use of incorrect tool steel or improper heat treatment. By use of The Carpenter Matched Set Method you get a plan of tool steel selection plus complete heat treating data.

It's as easy as this: For extra wear resistance you select a steel from the top of the diagram. For extra toughness from the bottom row. And for a good balance between wear resistance and toughness from the middle row. For greater hardening accuracy and safety you move to the left and for red hardness to the right.

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Fig. 3—Pickled strip from hot air flash drier (extreme left) is recoiled by unit shown at right

bath of the second tank is approximately 180 to 190 degrees Fahr. and as such the pickling action starts immediately in the second tank.

A cold strip entering the acid bath will not start to pickle until it has absorbed enough heat from the acid bath to bring it up to acid temperature. Therefore, this hot water tank is practically as efficient as an equivalent length of acid tank with a lower maintenance cost. To help this hot water tank remove the particles of scale, a recirculating spray is used at the delivery end and the volume of fine scale accumulated is large.

This tank, as well as all others, is made of reinforced concrete. The acid tanks are lined with a double thickness of acid-proof tile laid up in a suitable acid-resisting bonding material. The concrete shell is further protected by a 3/8-inch triple layer of acid-resisting plastic.

The acid tanks are made in two compartments. The top compartment is shallow and is constructed as a trough. The larger chamber directly beneath the trough serves as a storage reservoir; it is extended to one side of the line at the delivery end of each acid tank to form a sump and pump chamber.

Through suitable piping, the hot acid is circulated from the sump through the shallow pickling chamber or trough in a direction opposite to the travel of the strip through the pickler. At the opposite end of the trough, the acid flows through suitable openings back into the lower chamber for recirculation. The concave shape of the pickling chamber trough supports the strip along the edges and exposes both top and bottom surface of the strip to the flowing acid. There is no scratching of the strip surfaces.

Following the second acid tank, the pickled strip passes through a double set of pinch rolls between which is mounted a high-pressure cold water spray. The

water from this spray is wasted and carries with it that small amount of acid that was not removed from the strip by the first set of rubber covered pinch rolls.

From the cold water spray chamber the strip passes through a hot water tank which removes the last trace of acid. The heated strip then passes through a hot air flash drier and then into the recoiler shown in Fig. 3.

Anyone seeing this line for the first time is impressed by the clean-cut and tidy appearance, accessibility of all parts and the absence of overhead fume ducts. Fumes collected at the end of each tank by compact hoods, are drawn by suction into a combination fume duct and sewer. The sewer is mounted alongside the pickler just above floor level and drains into a central exhaust pit where the liquid is drained to a neutralizing tank and thence to the sewer. Fumes are exhausted by fans through a separate fume stack, Fig. 1. This picture was taken when the line was in full operation to show the absence of fumes.

The semicontinuous pickler (U. S. Patent No. 1,837,159) has a definite application to small plants. The line is flexible. The lengths of the pickle tanks are determined by the minimum thickness of the strip. The number of tanks is determined by the tonnage required. The width of the line depends upon the strip requirements of the individual plant.

The line is economical to operate. With proper handling facilities, a crew consisting of a picklehouse foreman, two men to operate the line and a crane operator, constitutes the entire crew. Critical materials have been eliminated to a great extent in the construction and as such the entire installation becomes comparatively inexpensive.

Tanks are well insulated so that heat losses are low. Maintenance costs also are low because of the type of construction and the use of a minimum number

of mechanical units. Because of the low installation cost and the low maintenance and operating costs, the actual cost per ton of pickled steel becomes attractive.

## New Flushing System Cleans Marine Gears

Developed to hasten the delivery of turbine powered vessels, a new method of flushing dirt from marine reduction gears is announced by Winslow Engineering Co., Oakland, Calif.

Prior practice among builders of reduction gears and at shipyards has been to flush out dirt, welding scale, metal chips and other foreign matter by circulating special flushing oils in the lubrication oil system. This frequently required a number of days of continuous circulation, since the strainers or centrifuges remove only larger particles. Now a battery of large-capacity filters are inserted directly in the main lubricating oil line and the entire flow of oil is circulated through special filters.

Typical installations at one Navy yard consist of six filters connected together in parallel by integral inlet and outlet manifolds. Cases for filter elements are steam jacketed to raise the oil temperature to approximately 140 degrees Fahr. An alternate method of oil heating is to use the heat exchanger normally used to cool the lubricating oil by removing cooling water connections and running steam through the unit.

In each oil conditioner there are 57 individual filtering elements that give a total area of more than 4700 square inches. When gages indicate a back pressure of about 15 pounds, the elements are replaced. One model handles 75 gallons per minute of SAE 30 oil at 140 degrees Fahr.

## Gasket Story Filmed

A 35-minute color and sound film "Only A Gasket," with commentary by Lowell Thomas, is announced by Goetz Gasket & Packing Co., 17 Allen, New Brunswick, N. J. It tells the story of research and manufacturing facilities employed in sealing joints against high temperatures, pressure, corrosion, and other service conditions.

Application is requested on official letterhead. No charge is made.

The Ebonol "C" process of Ethone Co. Elm street, New Haven, Conn., produces a stable, nonreactive cupric oxide coating on copper alloys, giving adhesion to lacquers, paints and enamels under severe weathering. The nap-like coating prevents reaction with organic finishes and provides an absorbent base. Sixty-five per cent copper alloys take a mahogany brown finish, and purer alloys turn black, making clear lacquers or i-coat white pigmented paints unsuitable. Application is by immersion in a dilute solution near 210 degrees for 10 minutes.



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#### ARROWS INDICATE JOINT

*This is a Photomicrograph (500 Diameters) of a perfect copper brazed steel to steel joint. Note individual crystals formed half on one side of the joint, half on the other. Metallurgically, the joint no longer exists. (Brazing done in Salkover Metal Processing Co. Chicago plant).*

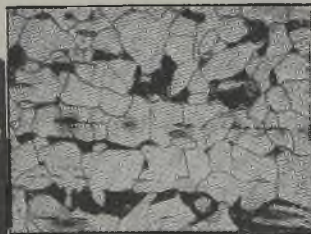






Fig. 1—Magnetic separators may be engineered into many handling systems. In this case, the material is elevated on a belt and after being cleaned, may be directed in one of several directions by the turn-table chute. Photo courtesy Cutler-Hammer Inc.

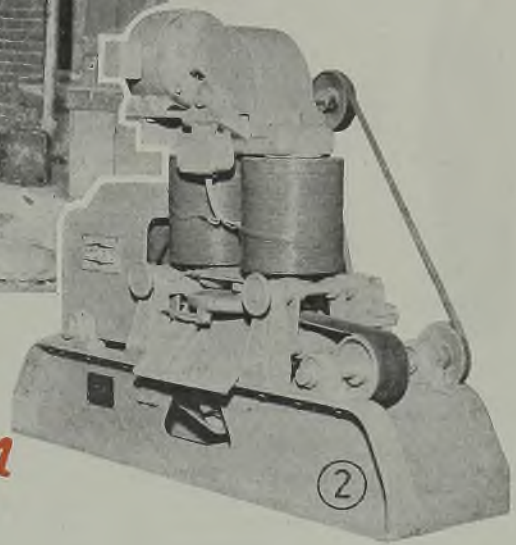


Fig. 2—Even slightly magnetic materials now may be handled by separators. This laboratory model is used to determine the best method for a given material. It is adjustable for various conditions and types of materials

# Magnetic Separation

Principles applied to many industrial processes, from segregation of scrap to removal of metal particles from oil lines

By JOHN E. HYLER  
Peoria, Ill.

MAGNETIC separating equipment has become a well-recognized part of many industrial processes where it is necessary to segregate ferrous materials from other types. Many improvements have been made in this type of equipment in the past few years and the number of applications has steadily increased.

A magnetic pulley is just what the name implies and usually is used in connection with a belt conveyor, being of sufficient width to accommodate the conveyor belt. The magnets revolve with the pulley, since the belt itself carries the ferrous materials to a point where they will drop. At the end of the conveyor, therefore, all nonferrous material spills directly off as it is affected purely by gravity. Ferrous material clings to the belt until it has been carried around the pulley surface, and is therefore delivered to a separate point, as shown in the simple diagram in Fig. 3. Many

variations are possible as indicated by Fig. 4.

Magnetic coils applied to pulleys are provided with electrical contacts, in most cases, through carbon brushes running on collector rings. One typical large magnetic pulley, built by a leading maker, is 42 inches in diameter and 60 inches wide and weighs 16,000 pounds. Rated at 9 kilowatts, it is served by a motor-generator set delivering 125 volts of direct current. Each magnetic coil in the unit is independent of the others, and each one is wound on a steel bobbin, so that it can be individually removed or replaced. It is assembled on a shaft 7 inches in diameter and 11 feet long, and the load is carried by three large roller bearings.

Considerable advancement has been made in the design of magnetic pulleys.

Improvements include vents in outer surfaces and at the ends to allow free circulation of air for dissipation of heat. In fact, the belt itself forces the air through the pulley.

Magnetic separators are used for separating ferrous chips, borings and turnings from other types of scrap. One special machine made by a leading builder has no magnetic pulleys, but features a belt running over two pulleys and above a vibrating tray, over which material to be sorted is fed. Mounted between the belt pulleys, and close to the lower strand of the belt, is a series of powerful, stationary electromagnets. The ferrous chips are attracted and drawn upward. These magnets are arranged with alternate polarities, and the scrap jumps from pole to pole as the belt runs below them, causing a jolting action which serves to further disentangle the scrap. Babbitt and cadmium are separated from cast iron borings and steel



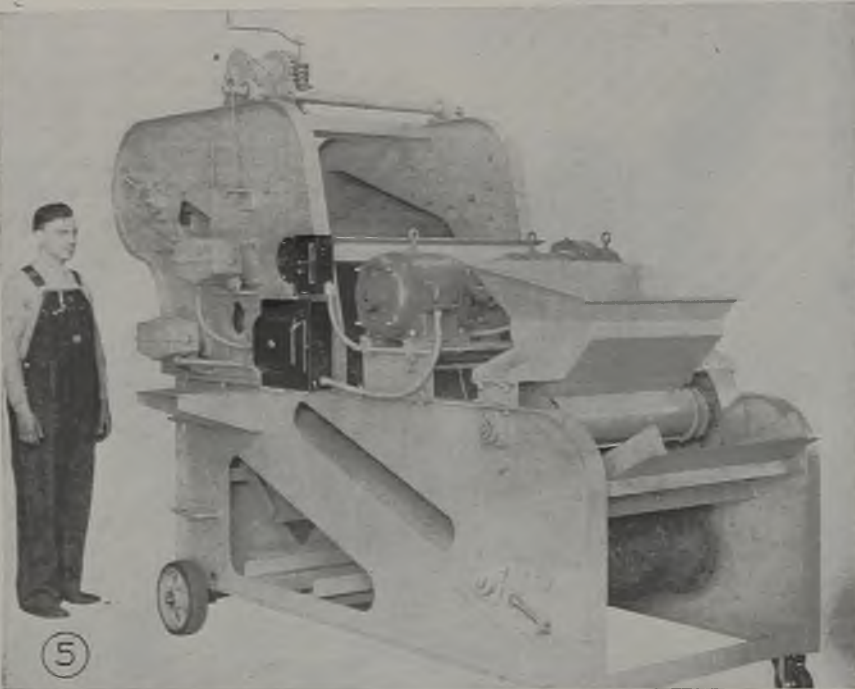
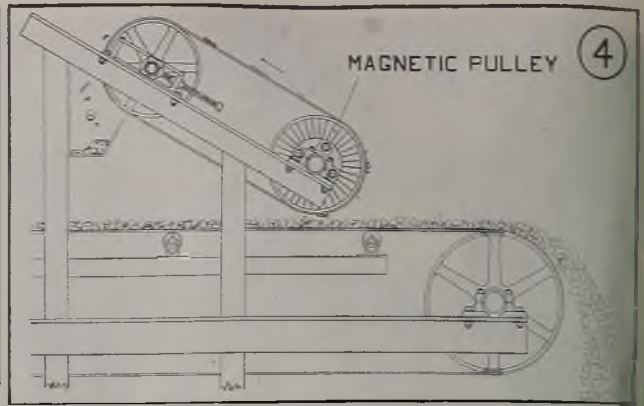
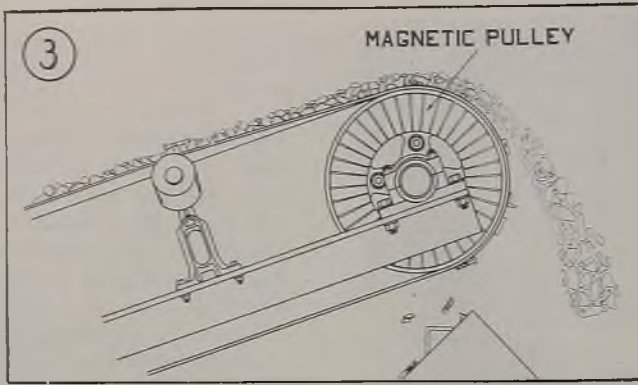


Fig. 3—This simple diagram clearly demonstrates the principle of magnetic separation whereby the ferrous material is carried around past the point where the belt leaves the pulley surface. Figs. 3 and 4 courtesy Dings Magnetic Separator Co.

Fig. 4—This diagram illustrates the variations possible, the upper conveyor being equipped with a magnetic pulley to pick up the ferrous material

Fig. 5—This separator employs two magnetic pulleys and belts. Material to be separated is shoveled into the hopper, the top magnetic unit picking out the larger ferrous pieces and the lower unit the finer material. Figs. 2 and 5 courtesy Stearns Magnetic Mfg. Co.

turnings are separated from brass borings, etc., using this machine.

Magnetic pulley machines are also used for similar duties, however. Fig. 5 shows a machine incorporating two magnetic pulleys and belts used to separate brass or aluminum scrap from iron and steel. One belt removes the larger pieces and the other the finer material. There are many other variations. One manufacturer, for instance, has produced a machine for separating badly tangled materials, which utilizes a revolving drum, in itself nonmagnetic, but having inside a magnet assembly which rotates rapidly. The rotation of the magnet assembly agitates the materials passing over the drum, thus aiding in separating them.

Magnetic separation no longer is limited to the separation of materials strongly magnetic from those entirely nonmagnetic. Materials only slightly magnetic now may be separated. Abrasives, ores, salt, slag, cotton seed, feldspar, enamel frit, sand, and many other materials can be processed magnetically to remove oxide scale, fine shot iron, iron bearing minerals and other impurities. Since it is often necessary to experiment for the purpose of finding the magnetic

process best adapted for any given material, and introduce it into practice, small laboratory separators of an adjustable type, like the one shown in Fig. 5, have been developed and put on the market.

#### Used in Handling Systems

Magnetic separation can be engineered into many types of mechanical handling systems. Fig. 2 shows a magnetic setup which elevates the material on a belt, so that a turntable-mounted chute can be used to direct the clean material in any one of several directions. A hopper is used to catch the ferrous material.

There are many places where coal, ore, rock, and other materials are being fed to pulverizers or to crushers, and where it is necessary to remove any pieces of iron or steel to prevent wrecking a machine. Such separation usually requires the use of a magnet, one method involving a magnetic drum. A large hollow drum carried on a shaft and power driven usually is used, having a chute leading down to its upper surface in such manner that a thin stream of material continually fed to the drum surface will be carried around it in the direction in which it is revolving.

The drum revolves around a stationary magnet, placed in such position, and of such a degree of power, that any ferrous material feeding over the top of the drum will be carried on past the point of gravitational delivery, and far enough beyond to be discharged at a different point.

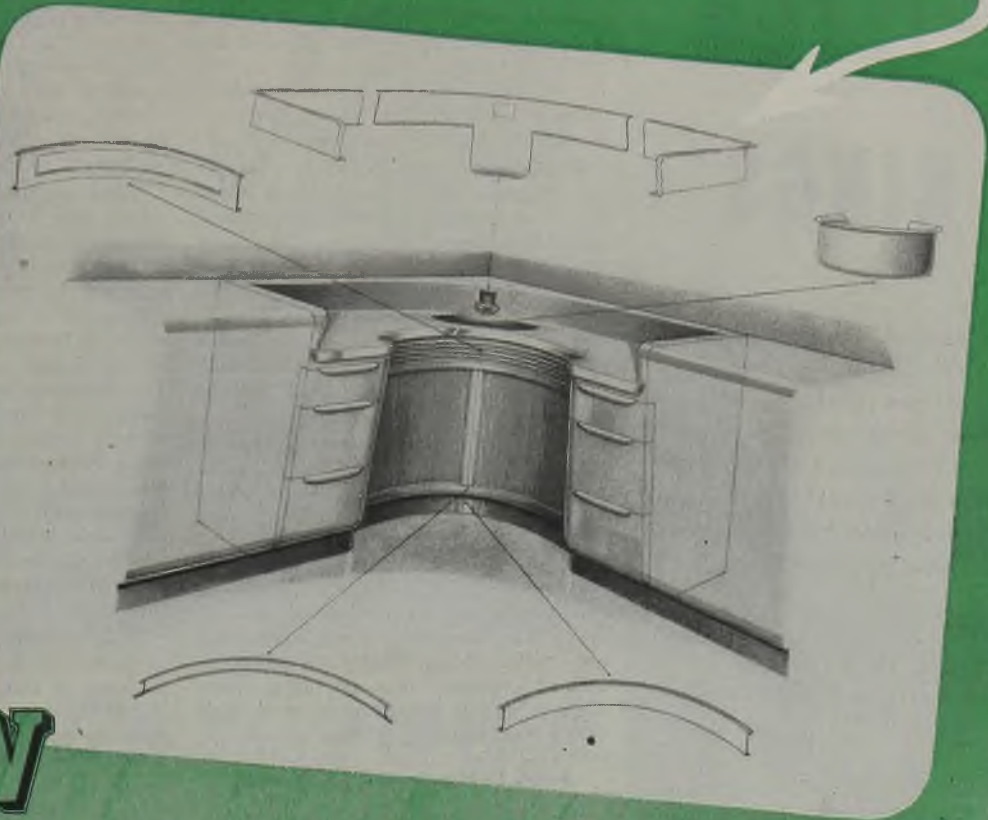
In cases where the material is being carried to the crusher, pulverizer, or other machine by means of a belt conveyor, a different type of magnetic apparatus must be used. One of the simplest is a large electromagnet that can be suspended directly over, and yet quite close to, the conveyor belt. With a magnet of this kind of sufficient power, any ferrous material will be attracted to it and be retained. Such magnets are very often used in places where it is not desirable to use a magnetic pulley.

A wet type magnetic separator developed several years ago has been installed recently in a number of mines in the Adirondack region of New York as part of the government's program to augment the supplies of iron ore. This machine consists of a stationary curved bank of 20 magnets, partly submerged in water, under which passes a thin conveyor belt. The magnet pole pieces are located outside the magnet casting and

(Please turn to Page 134)



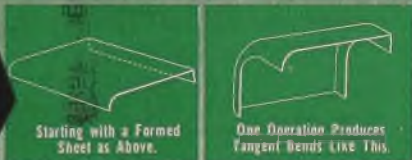
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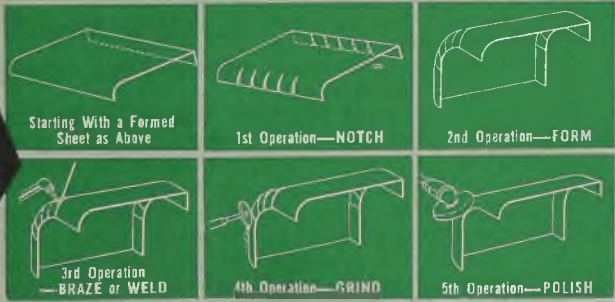
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# LAPPING PISTON RINGS

*for radial aircraft engines involves careful preparation of surface and use of retainer rings to close piston rings to shape they assume when assembled. Hyprolap machines and bonded abrasive laps employed*

By H. S. INDGE  
Lapping Engineer  
Norton Co.  
Worcester, Mass.



PISTON RINGS for the leading makes of radial engines for aircraft are lapped on the flat surfaces in Norton hyprolap machines using bonded abrasive laps. These rings are of cast iron and are from 5 to 6 inches in diameter and about  $\frac{1}{8}$ -inch thick. They are surface ground to within 0.002-inch to 0.003-inch of the required thickness and a gap is cut at one point so that when closed there is a certain definite pressure against the cylinder walls. It is, therefore, necessary to hold them in retainer rings during the lapping operation.

Retainer rings are bored to the outside diameter of the piston rings when closed, or perhaps a few thousandths of an inch larger so that the piston rings can be snapped easily into the retainers. This fit closes the piston ring to the same shape it will assume when actually assembled on the piston in the motor cylinder. Also, being lapped flat while in the retainer, the piston ring will be flat when in use.

Loaded retainer rings are inserted in circular apertures in workholder plates on the hyprolap machine. These plates are of sheet metal, circular in shape and slightly larger in diameter than the abrasive laps. They are about two-thirds the thickness of the piston rings. From six to eight rings constitute a machine load. The apertures in the workholder are about  $\frac{1}{8}$ -inch larger in diameter than the retainer rings, providing clearance to permit the retainers with their piston rings to rotate freely.

## Avoid Dragging on Lap Surfaces

Care must be taken in mounting the workholder plate on the three driving pins, to see that there is about the same clearance between the surfaces of the workholder and the adjacent laps. The workholder plate must be quite flat to avoid dragging on the lap surfaces at any point since such rubbing action will destroy the accuracy of the laps as well as develop wear on the workholder.

With the piston rings thus loaded in their retainers and these in turn placed in the workholder, the upper lap is lowered until contact is made with the piston rings and hydraulic pressure applied, after which rotation of the laps and of the workholder is started. Setup for this operation is shown in accompanying illustration, one view of the work performed by American Hammered Piston Ring Division of Koppers Co. With newly dressed laps a working pressure of from 50 to 60 pounds is sufficient. The pressure is increased up to a maximum of 80 to 100 pounds as the laps become smoother and cut more slowly. When the stock removal becomes too slow at the high pressure, it is time to dress the laps.

Dressing is done by slowly passing two sharp diamonds on a hydraulically operated arm between the rotating laps, or by bringing the lap faces together momentarily, the workholder and work having been removed from the machine. This latter method is known as "bumping" the laps and is done at intervals

between diamond truing or sometimes directly after diamond truing to produce a smoother surface on the laps.

When the laps are dressed with diamonds it is a good practice to load the workholder with a set of thick rings (about 5/16-inch thick) and run them a short cycle to condition the lap faces by removing edges and diamond lines. Both the inside and outside edges of the laps should also be smoothed and slightly rounded with a small abrasive stick. These precautions will avoid what is known as a "two-stone finish" or non-uniformity of the lapped surface.

Time required to lap a load of rings varies over a wide range according to amount of stock to be removed and condition of the laps, that is, how freely they cut, and the pressure used. Under ideal conditions a load may be lapped in about 7 seconds and under poor conditions it may take three times as long. The time required to obtain the desired results is estimated for each load and a clock known as a Kodak Timer having a large secondhand is used to guide the operator in accurately timing the lapping cycle. The length of the cycle will have to be varied somewhat from load to load and the operator soon learns what allowances must be made to suit conditions.

It is customary to measure one ring in each load to determine whether the thickness is within the prescribed limits. If too thick, a second lapping of short duration may be necessary to bring the work to size. This occurs most frequently on the first load after the laps are dressed because the operator uses a short lapping cycle to find out how fast the work is reduced in thickness and to avoid possible lapping undersize. Although only one ring is measured in each load before the load is removed from the machine, subsequent 100 per cent inspection of the rings may find occasional oversize pieces. These are accumulated until several loads are available and can then be relapped the short time necessary to size them accurately.

The coolant used is "mineral seal" oil or kerosene.

## Riveting Assembly To Save Time, Materials

A special bucking-bar setup for riveting which permits greatly increased output, facilitates uniform results and reduces the amount of manpower required to build airplanes is announced by Consolidated Vultee Aircraft Corp., San Diego, Calif. The assembly can be installed in a jig or frame so as to function automatically, or it can be wielded manually to increase individual efficiency.

Engineers claim the new unit will produce savings in time and materials amounting to at least 25 per cent. As soon as adequate facilities can be developed, company plans to make the assembly available to other manufacturers. Inventor is Morris Brown, a toolmaker in Convair's No. 2 plant.





# Let's Talk About **BETTER,** **SAFER** Surface Grinding

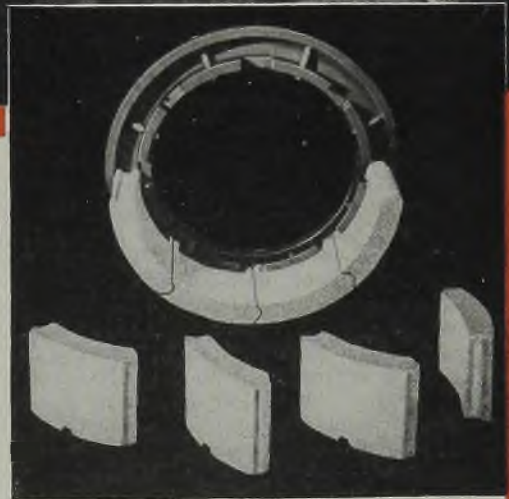
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# Economic Problems of

## WESTERN

## STEEL

## INDUSTRY



*Report discusses conditions which will come to the West in postwar period. Characteristics of industrial pattern will depend upon various complex economic phases. Raw materials, markets and equipment are being studied as a basis for judgment of future course of Western steel industry so greatly expanded during the war*

ANNUAL blast furnace capacity of the West has been increased from 757,000 to 2,715,000 net tons. For the region west of the Continental Divide, the expansion has been from 204,300 to 2,085,300 net tons annually. The steel ingot capacity for the region west of the Continental Divide is now 3,608,280 net tons as compared with 1,037,870 net tons before the war, or an increase of 248 per cent as compared with 15 per cent for the entire country.

Large additions also have been made to rolling mill facilities chiefly in flat rolled products where a million tons of annual capacity has been added in the plate field alone. The steel industry in the West has not only been changed from the point of view of size but the new units have been fully integrated with the raw materials of the industry.

The older Pacific Coast steel plants are of a size and type typical of those usually found where dependence is preponderantly on local supplies of scrap metal. They are equipped to roll a limited variety of products that can be most advantageously produced on a small scale. These plants have operated under an umbrella of prices approximately \$6 to \$8 higher than those prevailing along the Atlantic and Gulf coasts of the United States and from \$11 to \$16 higher than the prevailing basing point prices at the principal producing centers around Pittsburgh, Chicago and Birmingham. Added to this

From an investigation of "The Western Steel Industry" made by the Bureau of Economic and Business Research, University of Utah, Salt Lake City, Utah, J. R. Mahoney, director.

has been a favorable scrap supply that has provided this basic material at several dollars per ton less than in the main steel centers.

This pattern of steel prices must of necessity undergo some change on the basis of any assumption of full utilization of the new western steel plants. It will be necessary for these new plants to operate under conditions that will establish lower prices in order to induce a movement of their products into the western steel market. With such a change in the pattern of western steel prices there will logically follow a whole series of altered economic conditions.

### Fuel Costs Endangered

The supply of petroleum and natural gas that has been so abundant in the last three decades in California, especially the southern portion, has provided a cheap source of fuel and energy for industrial and other uses. There is the possibility that this era of super-abundance of these fuels is approaching the point of relative scarcity and higher costs. These results will be averted in the near future only if new fields are opened up at a rate not generally anticipated at present. The vast resources of coal in the Rocky Mountain field which contains approximately half of the reserves of the entire United States are likely to have greater prominence in the future growth of the West.

The total reserves of all the coal of the eleven Western States amounts to approximately half of the total reserves of the United States. Of this enormous reserve in the West, 48 per cent is lo-

cated in the continuous and almost unbroken Tri-state field in southwestern Wyoming, western Colorado and eastern Utah. By comparison, this field has reserves approximately twice those of an area of similar size in the heart of the Appalachian field in Pennsylvania and West Virginia. The total reserves in Wyoming, Colorado and Utah amount to 68.8 per cent of the total for the West and when Montana is added, 94.2 per cent is accounted for. This leaves 4.3 per cent for Washington and 1.5 per cent for all of the other western states. Idaho, Oregon, Nevada, Arizona and California are without important reserves.

Recent studies carried on by the University of Utah have brought to light a new extensive coking coal area which adds substantially to the coal reserves that may supply the needs of western blast furnaces.

The coal fields of eastern Utah which supply the coking coal for the blast furnaces in the Provo area and also for the one at Fontana, Calif., provide favorable conditions for economical mining. The Sunnyside bed from which all of the coking coal is now being mined ranges between 8 and 16 feet in thickness. Over an extensive area thickness is ideal for economical mining operations. Later when more easily mined coal is exhausted, the deeper coal can be mined. Entrance to these mines is either at ground level or slightly above which eliminates the need of shafts and hoists and as a consequence avoids costs that are usually necessary in the mining of coal.

The differences between Utah coking coal and that of the eastern producing regions are mainly in the ratio of fixed carbon and volatiles. The fixed carbon is lower and the volatiles higher in the Utah coal than in the Pennsylvania, West Virginia and Alabama coals on which the bulk of the American steel industry depends. The water content in Utah coals is only slightly higher, averaging 4 per cent as compared with

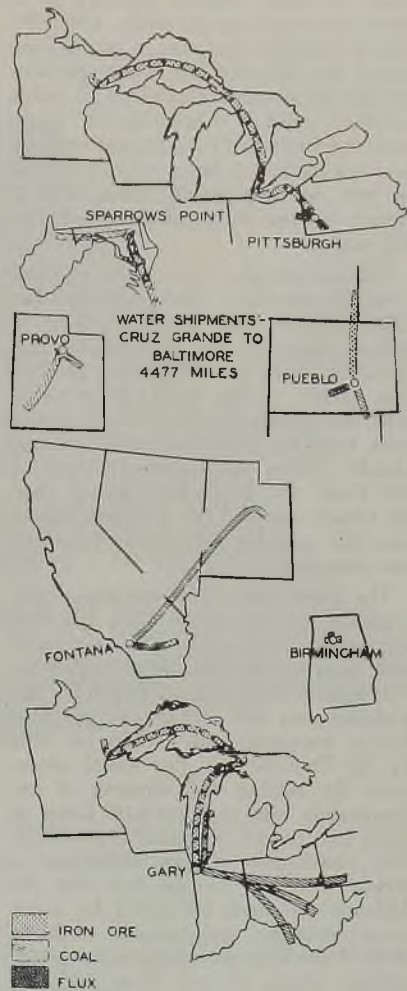




(Above)—Three-kilowatt mercury tubes provide adequate light on plate scarfing floor, Geneva Steel Co., Geneva, Utah. (Westinghouse photo)

(Right)—Comparative distances involved in assembling raw materials for pig iron production

(Below)—Movement of steel in 1940 by water and rail to western states

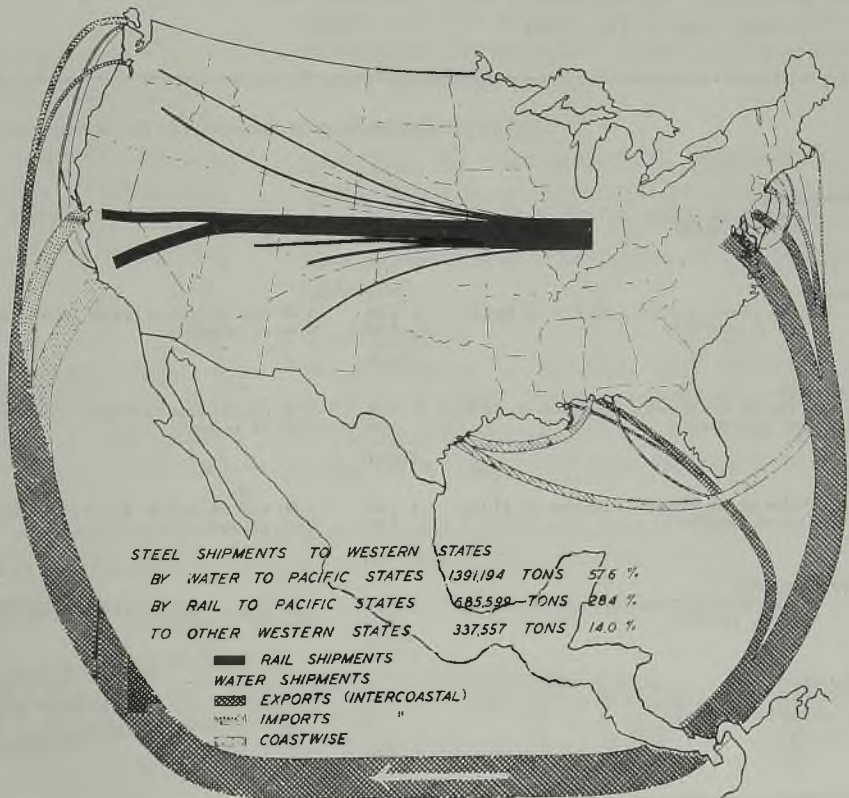


approximately 3 per cent for the eastern coals. The ash content is approximately the same as that in the coals of West Virginia but lower than in those of both Pennsylvania and Alabama. The sulphur content in the coal of Utah is lower than in those of West Virginia and approximately one-half that in the coals of Alabama and Pennsylvania. The lower percentage of fixed carbon in the Utah coals will require a great quantity to produce the required coke but this will be offset by a larger volume of valuable by-products.

The mining conditions for the Utah coking coal are more favorable than those surrounding the production of coal at Birmingham and somewhat more favorable than in most of the coal fields in West Virginia and Pennsylvania. As an offset to this advantage, the Utah coal must be transported farther than the Birmingham coal and at somewhat greater cost than the coal for the Pittsburgh furnaces but at much less cost than the coal for the southern Lake Michigan plants. The Fontana plant, however, has an 807 mile haul which will probably result in a high coke cost. This will be offset to some extent by proximity to a market where higher prices for the finished steel products will prevail.

Little has been done on the possibility of blending different west coals to improve their coking qualities. The needs for coking coal west of the Continental Divide are now ten times greater than they were before the war and future expansion of the western steel industry may increase these requirements.

For the region west of the Continental Divide, a single blast furnace with an annual requirement of less than 400,000 tons of iron ore did not present a background requiring extensive and systematic exploration. Nature had already disposed in the deposits in one narrow area in southern Utah sufficient iron ore to last this small blast furnace for many generations. The almost overnight in-





crease of blast furnace capacity to a point requiring approximately 4,000,000 tons of iron ore per year, a tenfold increase, has changed the whole picture, but due to wartime absorption in other activities, only a beginning of systematic explorations for additional deposits has been made. A more vigorous search for iron ore reserves for western blast furnace use can be expected in the post-war period.

The Geneva plant secures its iron ore from the southern Utah deposits 232 miles distant. This iron ore occurs in deposits that provide a favorable condition for open pit mechanized production which, on the basis of available data, will permit equal or lower mining costs than the open pit mines on the Mesabi. Since the metallic content of the Utah ore is slightly higher than the Mesabi ores and the moisture content less, this provides a favorable comparative situation.

The costs and other conditions surrounding the mining of Utah iron ore are especially favorable when compared with those for the iron ore on which the Birmingham steel industry depends. The Alabama ores will average 37 per cent iron as compared with the 56 per cent for the Utah ore and this would necessitate the mining and shipping of approximately one and one-half times as much iron ore for Alabama as for Utah. The significance of this difference is greatly increased by the fact that the Alabama ore must be mined by much more expensive underground methods. Most of the iron ore mined in the Birmingham region is now from 3000 to 5000 feet down the dip from the mouth of the mine at working faces approximately 2000 feet in vertical depth below the surface. Approximately 4 tons

(Please turn to Page 124)

Table 1—Capacities of Western Steel Plants  
BLAST FURNACES

	No. of furnaces	Annual capacity (net tons)
Columbia Steel Co., Ironton, Utah	2	504,300
Geneva Steel Company, Geneva, Utah	3	1,150,000
Colorado Fuel and Iron Co., Pueblo, Colo.	4	750,000
Kaiser Co., Inc., Fontana, Calif.	1	432,000

COKE OVENS

	Number of furnaces		Annual capacity (net tons)
	Beehive	By-product	
Columbia Steel Co. Ironton, Utah	500	56	209,500
Columbia, Utah			300,000
Geneva Steel Co. Geneva, Utah		252	1,094,000
Colorado Fuel & Iron Co. Pueblo, Colorado		192	675,000
Kaiser Company Inc. Fontana, Calif.		90	840,000

Table 2—Types and Capacities of Western Steel Furnaces

	Number	Capacity (tons)		Annual capacity (net tons)
		Open Hearth	Electric furnace	
Columbia Steel Co. Pittsburg, Calif.	5	75-100		962,600
Torrance, Calif.	4	60		262,500
	1		6	
Bethlehem Steel Co. Los Angeles, Calif.	3	50		117,000
San Francisco, Calif.	5	60		235,000
Seattle, Wash.	5	50		210,000
Colorado Fuel & Iron Co. Pueblo, Colo.	16	90		1,200,000
Judson Steel Corp. Oakland, Calif.	3	30		86,720
Pacific States Steel Corp. Niles, Calif.	1			86,400
Oregon Elec. Steel Rolling Mills Portland, Oreg.	2		16	84,000
Northwest Steel Rolling Mills Seattle, Wash.	1		15	
	1		5	82,400
National Supply Co. Torrance, Calif.				40,500
Kaiser Co. Inc. Fontana, Calif.	6	185		675,000
Geneva Steel Co. Geneva, Utah	9	225		1,280,000
Total				4,539,970

Table 3—Cost of Materials Per Ton of Pig Iron

	Iron ore	Coke	Flux	Total
<b>Birmingham</b>				
(Value of ore at mine, 2.7 tons @ \$1.65)	\$ 4.45	1.65 tons of coal @ \$2.28 (2350 lbs. of coke)	\$ 3.76	
Cost of assembly	1.25	Cost of assembly	1.64	
	\$ 5.70		\$5.40	\$11.40
<b>Gary</b>				
(Value of ore at mine, 1.85 tons @ \$2.59)	\$ 4.80	1.38 tons of coal @ \$2.03 (1900 lbs. of coke)	\$ 2.80	
Cost of assembly	3.52	Cost of assembly	3.99	
	\$8.32		\$ 6.79	\$15.56
<b>Pittsburgh</b>				
(Value of ore at mine, 1.85 tons @ \$2.59)	\$ 4.80	1.38 tons of coal @ \$2.01 (1900 lbs. of coke)	\$ 2.77	
Cost of assembly	5.88	Cost of assembly	.31	
	\$10.68		\$ 3.08	\$14.21
<b>Utah</b>				
(Value of ore at mine, 1.85 tons @ \$1.00)	\$ 1.85	1.60 tons of coal @ \$2.20 (1800 lbs. of coke)	\$ 3.52	
Cost of assembly	2.78	Cost of assembly	2.16	
	\$ 4.63		\$ 5.68	\$10.76
<b>Sparrows Point</b>				
(Value of ore at mine, 1.46 tons @ \$1.52)	\$ 2.22	1.25 tons of coal @ \$2.01 (1720 lbs. of coke)	\$ 2.51	
Cost of assembly	5.26	Cost of assembly	3.75	
	\$ 7.48		\$ 6.26	\$14.19
<b>Fontana</b>				
(Value of ore at mine, 1.85 tons @ \$1.00)	\$ 1.85	1.6 tons of coal @ \$2.20 (1800 lbs. of coke)	\$ 3.52	
Cost of assembly	3.05	Cost of assembly	6.96	
	\$ 4.90		\$10.48	\$15.83





6  
Simple ways  
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**INSULATING  
FIREBRICK**



Different grades and makes of Insulating Firebrick have widely differing properties. To obtain the maximum value for a given application, select the brick that will best fulfill the following:

**1—Limiting Service Temperature—**

The group or grade of insulating firebrick is established by the maximum temperature at which your furnace will operate. Select the group or grade next above this temperature.

**2—Weight and Conductivity—**

Generally, the lighter the brick, the lower the conductivity will be. Heat losses can be kept at the minimum only by selecting the lightest brick with the lowest conductivity. Compare conductivities based on ASTM test C-182-43T. Do not compare results obtained by different testing methods; they cannot be correlated.

**3—Stability—**

Cold crushing strength does not always indicate the stability of an insulating firebrick under fire. Compare the hot-load strengths. This is an essential factor for spring arch and for high wall con-

struction and an important indication of length of service to be expected.

**4—Durability—**

Insulating firebrick should show little or no permanent volume change after heating to their recommended temperature limits. Compare results based on ASTM test C-93-42.

**5—Responsibility—**

Consider the manufacturer's responsibility, his ability to produce uniformly high quality materials, and his knowledge and experience with applications of insulating firebrick to different types of furnaces.

**6—Value—**

An evaluation of benefits and advantages for your particular furnace application should be made as a final step. Price alone is no criterion—a low price may result in an expensive investment.

Your local B&W representative will be glad to give you the necessary information on B&W Insulating Firebrick to make this kind of an evaluation.

**THE BABCOCK & WILCOX CO.** Refractories Division 85 Liberty St., New York 6, N. Y. R-176



**BABCOCK & WILCOX**





Fig. 1 (Right)—Selective copper brazing the tips only of an ordnance assembly

Fig. 2—Two cheek plates are tack-welded and brazed to the strip with fine surface finish following quench. Process features absence of blown copper, surface blobs, reduction of distortion



# Salt Bath Brazing

... reduces rejects, improves finished ordnance parts by selective operation in salt bath furnaces

WHAT was once considered a difficult, tricky job is now a simple, fool-proof production heat-treating operation with results that are almost completely predictable. Selective copper brazing of an ordnance part on a high production basis but without high scrap percentages has been developed at Industrial Steel Treating Co., Jackson, Mich.

The process employs electric salt bath furnaces which not only permits the selective heating of the parts to be brazed, but also eliminates decarburization and has reduced scrap from 15 per cent to a maximum of 3 per cent. The salt bath furnace method also has reduced distortion so that the amount of time and cost involved in straightening brazed work has become negligible.

The operation consists of copper brazing two small cheek plates to a length of SAE-1050 steel. The plates, approximately 1 inch square and  $\frac{3}{8}$ -inch thick, are first tack-welded to the sides of the strip—the copper shim being inserted prior to the welding. The parts are placed in a rack holding 20 pieces which provides for easy handling.

Three standard electrically heated salt bath furnaces are employed—preheat, high heat and quench. The temperature of the furnaces are controlled automatically to close limits with special timing controls. The control for the high-heat furnaces holds the temperature of the

furnace at a constant level until work is to be treated. Then, a special heat measuring control on the instrument panel permits the operator to add exactly the required amount of heat for the exact predetermined time. Thus, the operation is entirely automatic with temperatures and time being fully controlled.

The rack with the work is first placed over the mouth of the preheat furnace so that the ends of the work, which are to be brazed, are immersed in the molten salt. The temperature of this furnace is held at 1550 degrees Fahr. When the work has had sufficient preheat, the rack is transferred to the high-heat furnace immediately adjacent to the preheat furnace.

## Salt Acts as Flux

The time that the work remains in the high-heat furnace and the temperature at which the furnace is held are both important. The temperature is held at exactly 2090 degrees Fahr. and the time is exactly  $\frac{3}{4}$ -minute. Immediately before the operator transfers the parts to the high-heat furnace, he sets the control to add sufficient power to hold the temperature of the salt at the exact temperature for the exact time. When he places the work in the high-heat furnace, he touches a button on the control board and the cycle is started.

At the end of the time, the operator

is signalled and the work is transferred to the quench. The salt quench is one of the reasons for the success of the process. It checks the flow of copper immediately, eliminating the tendency of the copper to run or blow or form a blob on the surface of the work. The work is removed from the salt quench clean and smooth except for a thin and unimportant coating of salt. Temperature of the quench, usually held at 1150 degrees Fahr., is neither critical nor too important. It is only necessary that the quench be salt since a water or oil quench will invariably blow the copper out and form objectionable blobs on the surface.

After the quench, the work is rehardened and straightened. Rehardening also is a simple matter since the use of the salt bath prevents any noticeable decarburization. Work is reheated to 1550 degrees Fahr. immediately after the quenching so that it is hardened to the required 50 to 52 rockwell.

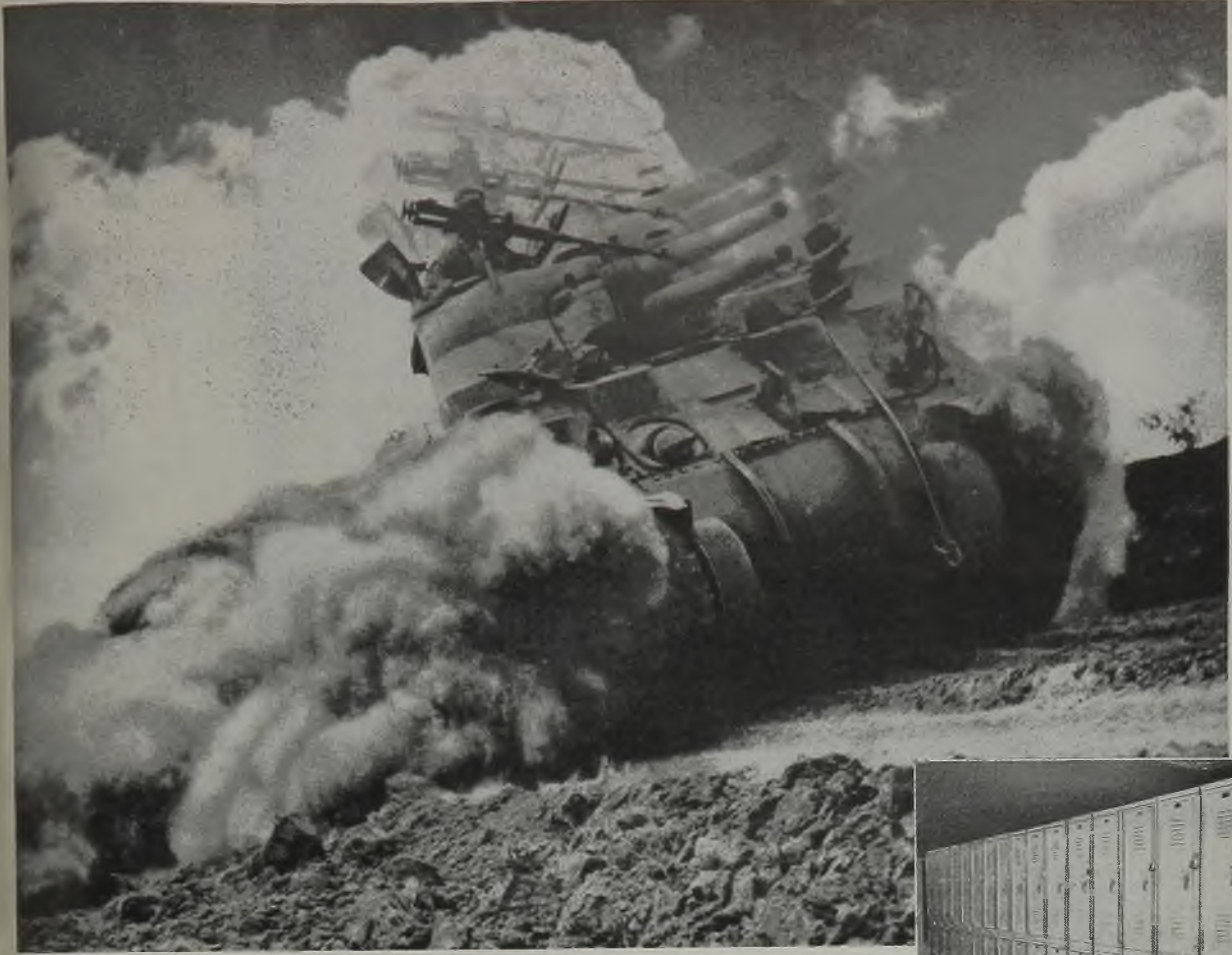
An interesting feature of the process is that flux is not required as the salt itself acts as a flux.

The amount of straightening necessary is nominal due to the fact that only a small portion of the part is heated. Moreover, the temperature of the bath is controlled to such close limits that even though the entire part were immersed at

(Please turn to Page 110)



Making strong the things that make America strong



## Supporting a Tank's Attacks . . . Speeding a Locker's Schedule

ITS ROARING GUNS . . . its quick starts and sudden stops . . . its steep climbs and chudding drops . . . all combine to give a tank a beating no other vehicle is asked to take. Its bolts and nuts must be made of rugged stuff . . . tough metal, strong heads, sturdy threads . . . subjected to scrupulous inspection.

A locker leads a lazy life in use . . . but sluggishness on the assembly line can throw its production schedule out of gear. Here, bolts and nuts must be accurately dimensioned and clean-threaded for quick get-away and speedy run-on.

Maximum resistance to every strain

your product must stand . . . top assembly speed that guards against bottlenecks and mounting costs: these are built into every RB&W EMPIRE fastener.

For 99 years, constantly improved strength, accuracy and finish of RB&W products have resulted from continuous research and progress. Starting with RB&W's development of the first automatic cold-header, this progress has been sustained by great investments in the most modern manufacturing equipment and methods of quality control.

RB&W's proved ability to put the ideal combination of strength, accuracy and



finish into fasteners explains why the RB&W EMPIRE brand is so generally specified in the best farm implements, automobiles and aircraft; by railroad and construction engineers; in power and transmission equipment; and by general industry . . . and why RB&W products can help you make *your* products stronger and faster.

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Russell, Burdsall & Ward Bolt and Nut Company.  
Factories at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill. Sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Los Angeles, Portland, Seattle.



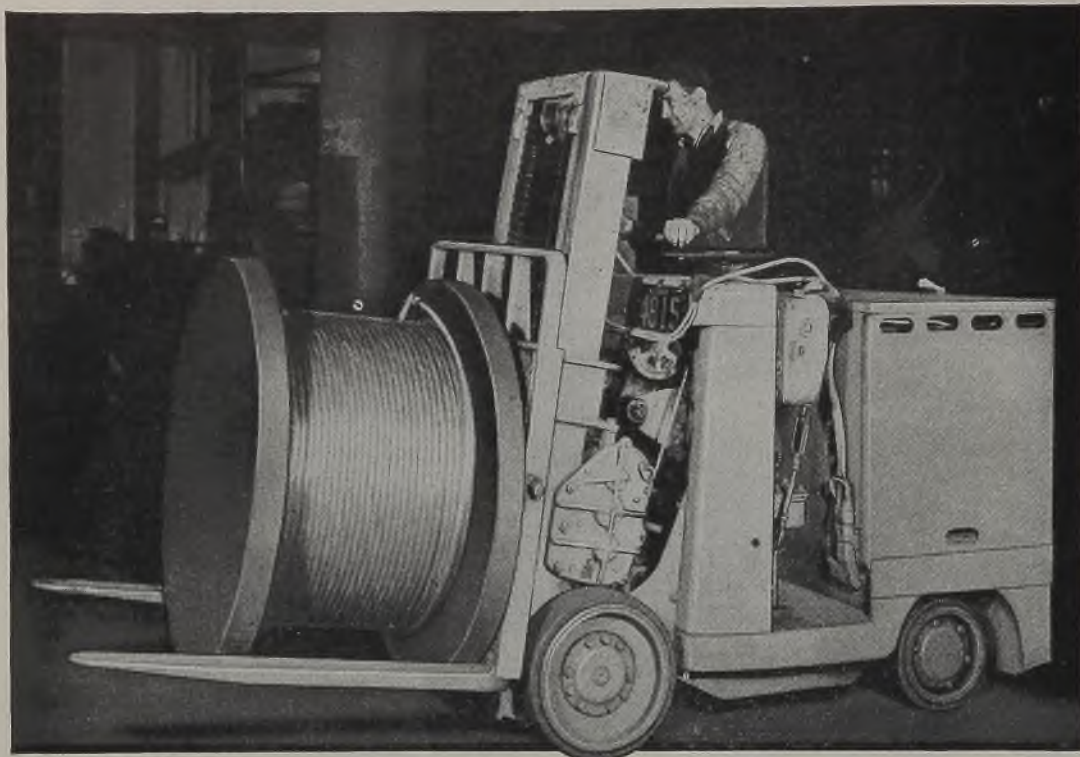
AND ALLIED FASTENING PRODUCTS - SINCE 1843

## RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY





# STOP AND



Modern, center-control fork trucks handle palletized unit loads; can also pick up and carry many types of loads without the use of any kind of dunnage. With batteries exchanged once or twice a day, they operate 24 hours a day with maximum dependability. Articles describing modern handling methods appear regularly in STORAGE BATTERY POWER. Write for sample copy if you do not already receive it.

In replacing a loaded skid box with an empty beside a machine, an industrial truck will make an average of approximately 14 moves forward, backward, up and down. A battery industrial truck has a natural advantage in this kind of stop-and-go service because it gets the necessary surges of power instantly from its battery, yet consumes no power during the stops. Thus it is not only economical of power, but the electricity used for charging its batteries is low-cost power.

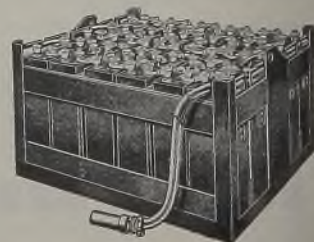
Its electric-motor drive operates quietly, without vibration, and thus with well-nigh negligible repair requirements. With batteries exchanged two or three times per 24

hour day, it is continuously supplied with power and, since one battery is charged while the other works, the truck need not stop work for servicing of its power unit.

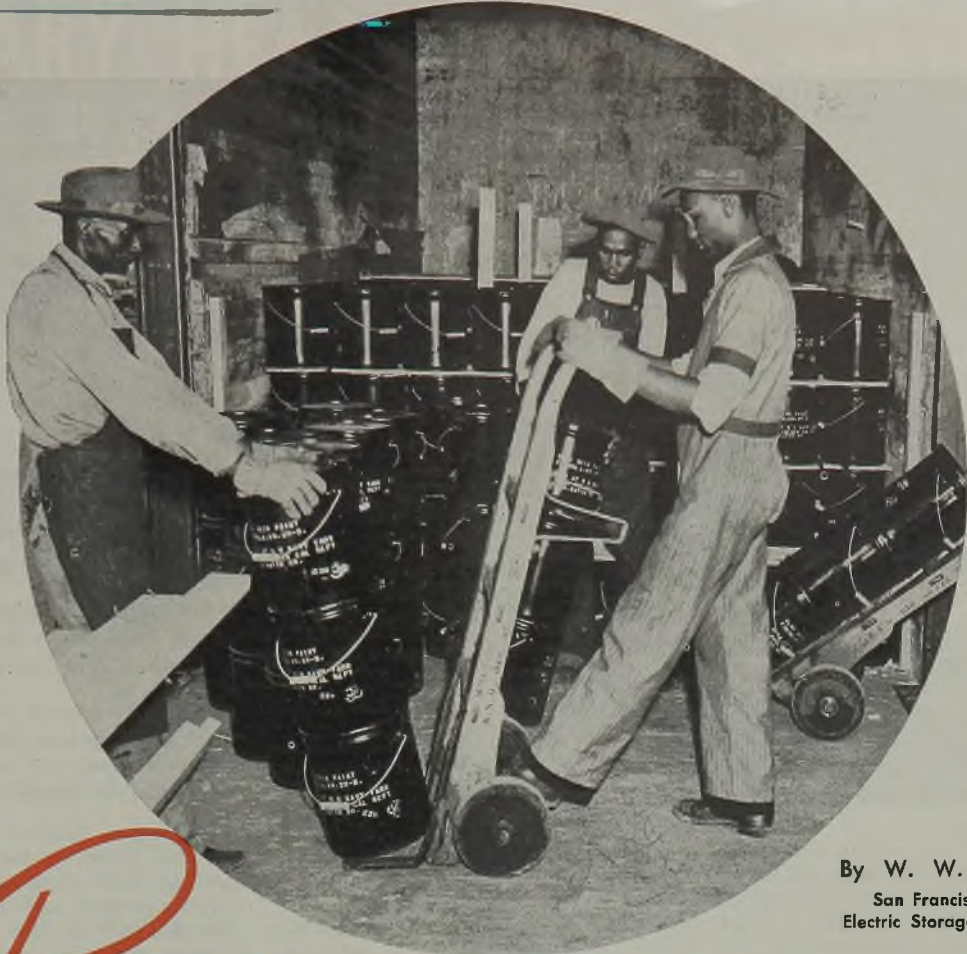
For 24 hour-a-day material-handling work, therefore, a battery industrial truck is an inherently dependable and economical machine, especially when powered by Edison Alkaline batteries. With steel cell construction, a solution that is a natural preservative of steel, and a fool-proof electrochemical principle of operation, they are the longest-lived, most durable, and most trouble-free batteries. *Edison Storage Battery Division of Thomas A. Edison, Inc., West Orange, New Jersey.*

## Edison

ALKALINE BATTERIES







By W. W. GRUNDEL  
San Francisco Branch  
Electric Storage Battery Co.

# Palletizing Containers

... shows substantial savings in time, labor and costs expended in unloading and storing cans of paint. Methods equally applicable to wide variety of products. While savings are important in speeding war time shipments, they will be more important in assuring postwar profits

A MANUFACTURER on the Pacific Coast was confronted with the problem of how best to load a freight car with 5-gallon cans of paint. The aim was to obtain minimum cost of loading and unloading, as well as storing at the receiving end.

Before the paint cans were palletized, maximum load per car was 1305 cans. These were manually loaded in three tiers with dunnage between each tier to keep the load from shifting. Load also

had to be well shored to sides of freight car to prevent damage in transit.

To unload this arrangement, the cans were stacked manually on pallets and then the palletized loads were moved about 100 feet to storage where the loads were tiered four pallets or 12 cans high.

Six men plus a fork truck and its operator required 7 hours to do this job.

By extending the palletization to the point of original shipment, important economies were obtained. The shipper now places 48 cans on a pallet forming a unit load of 2500 to 3100 pounds. Upon arrival at receiving end, fork truck removes the pallet loads directly from the car, takes them to storage and tiers the load as required.

One man in addition to the fork truck

*Fig. 1 (Circle)—Old method required gang of six men in addition to fork truck and operator. Such piece-by-piece handling methods are not only slow but expensive*

*Fig. 2 (Left)—New method employs unit loads steel strapped on pallets which are quickly positioned in cars by fork trucks*

*Fig. 3 (Right) — New method avoids use of considerable dunnage by steel strapping groups of pallets as shown here, total of 32 board feet as against previous 375 per car. Eight steel straps 1 1/4 inches by 26 feet make a tight steady load*

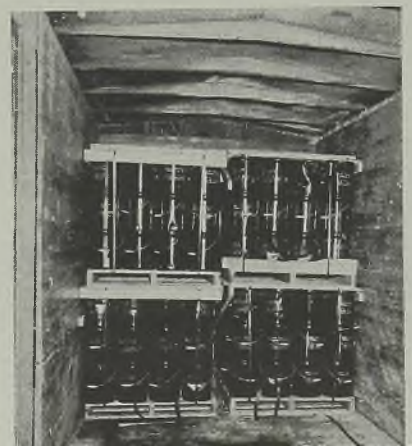
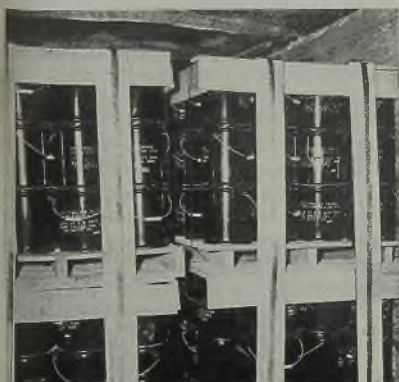






Fig. 4—Unloading of car employing palletized loads is quick and easy when fork truck is employed as shown here. No more "bucket brigade" hand passing methods

Fig. 5—Old method of loading required 375 board feet of dunnage between each tier of cans so that load could be securely shored to prevent damage in transit. Official U. S. Navy photos, from Electric Storage Battery Co.,

and its operator now unloads the palletized shipment of 1344 cans in 1¾ hours.

Savings are significant: Number of cans per car load was increased from 1305 to 1344; men needed to unload car reduced from 7 to 2; time to unload car cut from 7 to only 1¾ hours; man hours

dropped from 49 to 3½—at cost per man hour of 88 cents; cost of equipment operation was cut from \$3.50 to \$0.88 and cost to unload car was then only \$3.96 instead of the former \$46.62—a reduction of over 90 per cent. Cost per ton was cut from \$1.17 to \$0.113; similar sav-

ings were made by the shipper. Cost figures are based on direct labor plus cost of truck operation, include no overhead.

Savings such as these are responsible for more and more quantity consumers ordering suppliers to make shipments in form of standardized pallet loads.

## Wire Association Will Meet in Pittsburgh

War-time Emergency Convention of the Wire Association will be held at the William Penn Hotel, Pittsburgh, Oct. 16-19. The Mordica Memorial Lecture entitled, "Carbon Steels for the Wire Industry," will be presented Wednesday morning, Oct. 18 by A. M. Reeder, metallurgical engineer, Jones & Laughlin Steel Corp., Pittsburgh. Other papers to be presented at the technical sessions follow:

Monday, Oct. 16

2:30 P.M.

Chairman: E. W. Gundstrom, assistant plant manager, Rome Cable Corp., Rome, N. Y.  
Opening Address: D. D. Buchanan, president, Wire Association.

"Safety in Wire Mills," by R. H. Ferguson, manager of safety, Republic Steel Corp., Cleveland.

"Handling Wire Mill Labor Problems," by J. J. Sanderson, assistant superintendent of Wire Mills, Keystone Steel & Wire Co., Peoria, Ill.

Tuesday, Oct. 17

9:30 A.M.

Chairman: J. L. Scheuler, general superintendent, Continental Steel Corp., Kokomo, Ind.

"Cleaninghouse Practices," by F. P. Spruance, vice president, American Chemical Paint Co., Ambler, Pa.

"A Reappraisal of Electro-galvanizing," by E. H. Lyons Jr., chief chemist, Meaker Co., Chicago.

"Variable Speed Transmissions for the Control of Tensions and Velocities in Processing Wire and Cable," by J. H. Geptert, engineer, Reeves Pulley Co., Columbus, Ind.

1:30 P.M.

Chairman: W. H. Crawford, resident manager, Reliance Spring Washer Division, Eaton Mfg. Co., Massillon, O.

"Some Factors Influencing the Drawing of Fine Wires," by H. P. Edinga, factory manager, Wire Division, North American Philips Co., Dobbs Ferry, N. Y.

"The Physical Properties of High-Carbon Steel Rope Wire As Affected by Variations in Patenting," by H. J. Godfrey, development engineer, John A. Roebling's Sons Co., Trenton, N. J.

Wednesday, Oct. 18

10:00 A.M.

Chairman: D. D. Buchanan, president, Wire Association.

"Dies," by A. R. Zapp, manager, Firthaloy Division, Firth-Sterling Steel Co., McKeesport, Pa.

The Mordica Memorial Lecture: "Carbon Steels for Wire Industry," by A. M. Reeder, metallurgical engineer, Jones & Laughlin Steel Corp., Pittsburgh.

1:00 P.M.

Luncheon

Guest Speakers: To be announced.

4:00 P.M.

Annual Meeting

7:30 P.M.

Annual Stag Dinner

Thursday, Oct. 19

9:45 A.M.

Chairman: C. A. Litzler, chief engineer, In-

dustrial Oven Engineering Co., Cleveland.

"Discussion on the New Plastic—Polythene and It's Adaptation for Insulation of Electric Wire and Cable, and a Discussion of Plastic Used with Nylon in a New Switchette," by Dr. J. W. Shackleton, plastics division, E. I. DuPont de Nemours Co., Wilmington, Del.

"Synthetic Insulation and Jackets for Wire and Cable," by G. A. Rolston, chief engineer, Rome Cable Corp., Rome, N. Y.

1:30 P.M.

"Covering Weatherproof Cable," by H. Kaffine, chief mechanical engineer, Fidelity Machine Co., Philadelphia.

"Lacquers and Saturants," by R. Jordan, engineer, Ault & Wiborg, Cincinnati.

## Electronics Book Guide Available

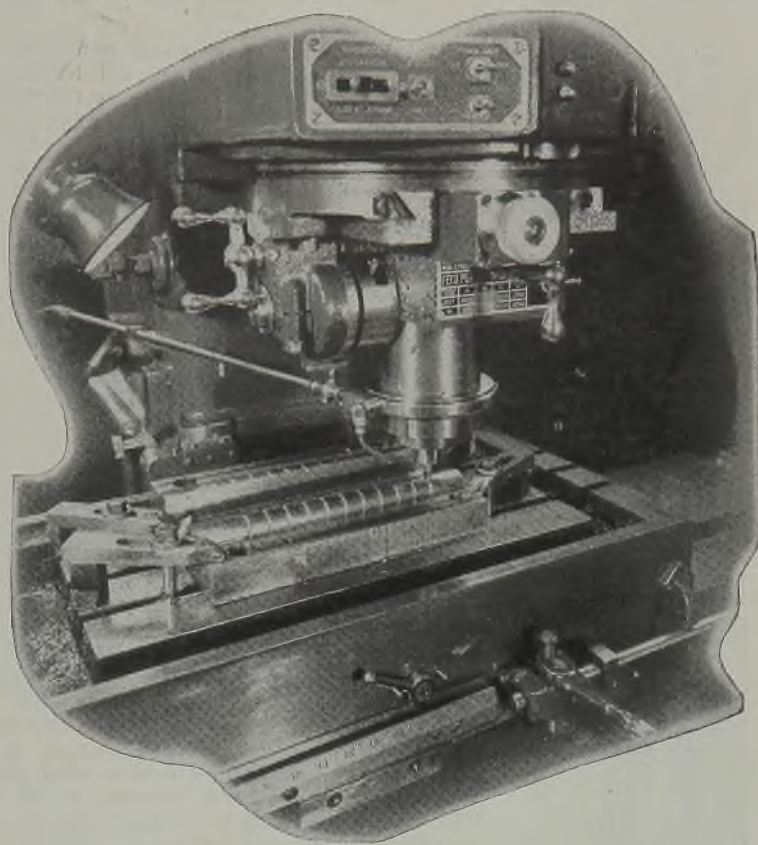
A guide to literature on radio and electronics, permitting rapid selection of books by title, author, publisher, subject, or application, and containing a wide selection of publications in that field and related subjects, is available in a new booklet obtainable from Allied Radio Corp., 833 West Jackson, Chicago 7. Listings cover simplest fundamentals to advanced practices for beginner, instructor, technician and engineer. The two parts of the booklet are a classified directory by subject (Aeronautics, Electricity, Engineering, Basic Training, etc.), and a listing under publisher, by author and title, with a brief summary of contents, size, number of pages and price.



# ROTARY HEAD MILLER . . . PLUS CHERRYING ATTACHMENT . . . SIMPLIFIES THIS "TRICKY" MILLING OPERATION

The Milwaukee Rotary Head Miller equipped with a cherrying attachment made "short work" of the "tricky" milling required on this injection mold. It took just two hours to complete the job — far less time than by any other method known.

The cherrying attachment is an auxiliary rotary head, mounted at 90° to the head of the miller. It is used to mill circles and angles in a vertical plane. When used with rotary head motion, spherical and conical cavities can be accurately and rapidly milled — in almost all cases difficult operations become a comparatively simple task.



## KEARNEY & TRECKER'S ROTARY HEAD MILLER

*The Most Versatile Machine Ever Designed for Mold and Die Work*

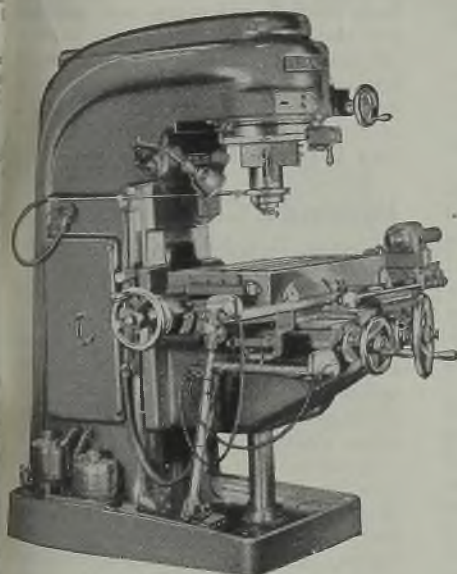
**DIRECT** . . . mills mold cavities in a single set-up without the aid of templates or models.

**ACCURATE** . . . chances for error are eliminated because there is no change in set-up. Exact control of all combinations of cutting movements — possible only with this machine—

transmits mathematical precision to the work.

**FAST** . . . initial job preparation and set-up time is reduced to the minimum. Accurate performance of the machine saves operator's time and rapid production of intricate molds and dies is the result.

*Write for Bulletin No. 1002C for complete information on the Milwaukee Rotary-Head Miller and the accurate and rapid production of all types of molds and dies.*



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Milwaukee Face Mill Grinder

Milwaukee Midgetmill

Milwaukee Speedmill



# Underground Belt Conveyor System

## Now Extends Over 5 Miles

WORLD'S longest underground continuous conveyor—the Colonial belt system—has become still longer. Built in 1924 by the H. C. Frick Coke Co. to connect its Colonial group of mines in Fayette County, Pa., with a tippie on the Monongahela river, it had an original length of 4 1/3 miles. It has now been lengthened to 5 1/4 miles, says *U. S. Steel News*.

The Colonial belt conveyor and its sister belt system, the 3-mile Palmer conveyor completed in 1928, were constructed to take advantage of the economies of shipping coal by river barge to the Clairton by-product coke plant of the Carnegie-Illinois Steel Corp. Since their completion, the Colonial conveyor has delivered nearly 63 million tons of coal from mine to river tippie while the Palmer belt system has handled approximately 52 million tons.

With the advent of the war, demands on the Klondike field, the coal deposit paralleling the river, became so great as to make heavy inroads on the remaining coal reserves in the basin, with the result that it became necessary to develop added sources of supply. One of the steps taken to augment coal production was to accelerate the development of the Robena mine. Another was to reopen mines in the Lower Connellsville field, more distant from the river.

Accordingly, the Leisenring No. 2 and No. 3 mines were rehabilitated and these operations are now delivering coal by rail to the new terminus of the Colonial conveyor system at the Colonial No. 3 mine. Here a new terminal yard has been built to deliver incoming fuel to a car dumper.

The dumper, which went into service Jan. 7, 1944, discharges coal from the cars into a bin with a capacity of 200 tons. Coal is drawn from the car dumper bin through four openings on to four vibrating feeders, which deliver to a continuous 60-inch feeder belt, operating at 350 feet a minute. This, in turn, discharges to the slope conveyor, a 54-inch belt, operating at 600 feet a minute.

From the slope conveyor the coal passes into a 100-ton surge bin, from which it is drawn through three openings to three apron feeders, which feed to a 48-inch belt, running at 490 feet a minute, in 3100-foot extension to the Colonial belt.

The extension, in turn, delivers coal to a 60-inch belt, underneath rotary mine car dumps, situated at what was formerly the end of the Colonial belt conveyor. This belt, running at 350 feet a minute, empties on to the main Colonial belt, 48 inches wide, running at 490 feet a minute.

Leisenring No. 3 mine, which has been idle since late in 1926, is producing coal exclusively for shipment to the Colonial conveying system. Rehabilitation of the mine began in September 1941, and at present 1000 tons are being hoisted daily. When operations reach capacity, a total of 5000 tons of coal a day will be delivered to railroad cars. Three and one-quarter miles of railroad track, an extension of the Grindstone branch of the Pennsylvania Railroad, were constructed between Leisenring No. 3 plant and Leisenring No. 2.

Leisenring No. 2 mine, which had been idle since early in 1927, is a combination plant, part of its coal output being used for the production of beehive coke on the property and the remainder being delivered to the Colonial belt system. This plant is now hoisting 3500 tons of coal a day, of which 1800 tons is being charged into the 500 ovens. When it reaches capacity, it will hoist 6600 tons a day, of which 4800 tons will be delivered to railroad cars for shipment to the Colonial conveyor.

*Longitudinal section of Colonial conveying system. Railroad car dumper, slope belt and extension to Colonial belt, at right of illustration, all represent new construction.*

*(U. S. Steel News photo)*

## Salt Bath Brazing

*(Concluded from Page 104)*

the time of brazing, distortion would be very little.

The same equipment also was used for a time to braze the same parts but with brass instead of copper as the bonding medium. The time required was slightly less than that required for copper brazing but otherwise results were equally dependable.

Production speeds of brazing by this process, which employs Upton electric salt bath furnaces with Upton heat measuring control but without elaborate work handling conveying equipment, is estimated at 600 to 700 per hour.

## Cutting Oil Salvaged by Two Centrifuging Steps

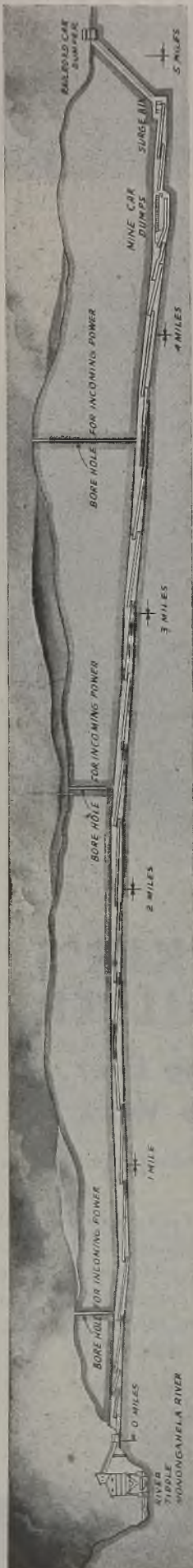
Cutting oil, trapped in chips raked out of the pans of automatic screw machines and other production machine tools results in the waste of thousands of gallons of valuable cutting oil every year. One of the most effective methods of salvaging this oil involves two centrifuging operations. The first, employing a "chip wringer" and consists of spinning out oil clinging to the metal chips. These machines have "whirling baskets" something like the centrifugal dryers used in laundries. This treatment also makes the chips more desirable as scrap.

The second operation consists of freeing the salvaged oil from fine chips, scale and other abrasive particles. Otherwise the recovered oil may damage tools, work and machines by abrasive action. The whirling bowl machines used for this purpose are distant relatives of cream separators. These high speed highly developed industrial centrifuges not only serve to restore the oil salvaged from chips to practically new condition, but also are used to maintain purity of oil recirculated to machine reservoirs. A booklet on centrifugal oil clarification as applied to batteries of machine tools is available from National Acme Co., 170 East 131st street, Cleveland.

## Hydraulic Control Test Center Established

To avoid the necessity of returning units to Detroit from the west coast and to make hydraulic testing facilities available in that area, with prompt inspection, test and repair work, Vickers Inc., has established a fully equipped office and shop in Beverly Hills, Calif.

Equipment is available for inclusive tests on pumps (fixed and variable displacement), double power units for turbines, hydraulic motors, pressure relief valves, unloading valves, accumulators and sequence valves. Equipment also includes dead weight pressure gage calibrating equipment. Testers for checking mechanical and volumetric efficiency curves on pumps are available, and can handle work on hydraulic machine control units as well as on aircraft installations.





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390



# Industrial X-Ray Units

## Speed Ordnance Production

Fast, automatic shell inspection also lowers number of rejects at three United States plants



Fig. 1 (Left)—Radiograph of a 155-millimeter shell showing excessive cavitation in explosive

Fig. 2 (Below)—Loading and unloading shell and cassettes in front of the X-ray chamber

MILLION-VOLT industrial X-ray units, purchased by the Ordnance Department from General Electric X-Ray Corp., Chicago, are used for shell inspection at three government ordnance plants.

The first unit, installed at the Milan Ordnance Center, is operated by Procter & Gamble Defense Corp. on a 24-hour-day, six day-a-week basis. Other units were installed at the Ravenna Ordnance Plant, Apco, O., operated by Atlas Powder Co., and the Iowa Ordnance Plant at Burlington, operated by Day & Zimmerman Inc.

Milan's installation, almost entirely automatic, was developed by General Electric engineers in co-operation with the Ordnance Department and Procter & Gamble Defense Corp. X-ray apparatus is used for inspection of 155-millimeter shell, although all types of ammunition are made, including anti-

tank and anti-aircraft shell, shell for field guns and trench mortars, and bombs of various sizes.

Inspection is carried out all along the production line. Hundreds of different subassemblies and component parts are checked before assembly, and checked again at various points during the assembly. X-ray inspection begins after shell are filled with TNT. The explosive is poured into shell casings at high temperature. In the cooling process that follows, it shrinks, as do many metals. An operator must exercise extreme care in pouring or cavitation may result. This cavitation, along with air bubbles and foreign substances, is seen easily in the TNT cast when shell are radiographed, as in Fig. 1.

Development of this special X-ray equipment makes it possible to inspect the shell without destroying it, and inspectors are given a much wider range

