STEEL

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NEWS

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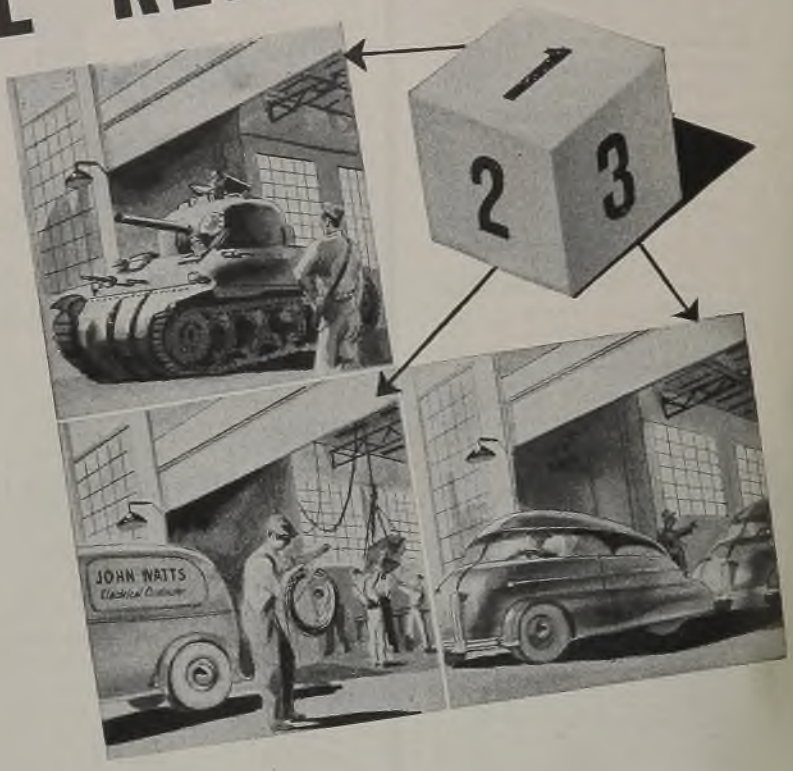

3 DIMENSIONAL JOB

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STEEL
August 14, 1944

An Important Issue

Two teams are choosing sides in a contest to determine whether problems of employment shall be handled on a national or regional basis. In the present debate in Congress over the relative merits of the Kilgore-Murray and George bills, in the 14-point platform of the 26 Republican governors and in arguments for and against some other legislative proposals, one finds one side lining up for nation-wide rules, regulations and standards and the other advocating more or less local determination of policy.

While these alignments have political significance, we choose to consider here only the economic aspects. Whether we take care of employment and kindred problems through a super-powerful central authority or through a number of regional authorities will make a lot of difference to private enterprises in every section of the country.

For instance, assume that the nation were to adopt a policy of insisting that every employer from Maine to California and from Minnesota to Louisiana pay the same wage for the same work. This is what Secretary of Labor Perkins advocated in the early days of NRA and in substance it is the objective of many of those who now favor centralized national control. Miss Perkins and her associates compromised on a zone system of wage scales, but the urge to create a one-wage standard for the nation still persists.

If a single-wage scale were adopted, it would create economic chaos. There are thousands of plants in small communities where most employes can lunch at home, do not pay car or bus fare to get to work and grow part of their food supply. To put them on a wage parity with big city workers who carry or buy lunches, pay 20 cents or more per day in transportation fare and buy everything from stores is to force economic adjustments which would react violently in the geographical distribution of manufacturing plants.

Likewise to put the wage scales of a moderate-sized town in Mississippi on a parity with those of a city like Flint, Mich., would lead to similar maladjustments economically.

Factors such as climate, size of community, conditions of living, etc. are too varied in this widely extended country to permit of a strait-jacket fashioned in Washington which will fit equally well in every community. We want to improve working conditions everywhere, but we cannot accomplish this by regimentation which ignores sectional and local circumstances.

IF NAZIS CAPITULATE: Every thoughtful American appreciates the position of the military men who fear that successes in battle will result in a psychological letdown in the war effort. No responsible person would do anything to encourage over-optimism at this critical time unless he felt he had to do it to avoid an even greater danger than over-optimism.

That is the predicament of WPB officials and of manufacturers who have substantial war contracts. They do not wish to promote public complacency, yet they are faced with the realistic problem of what shall be done if the European phase of the war should end suddenly in the near future.

Therefore they are trying to envision the conditions which will attend an armistice in Europe. Those who have given exhaustive study to this contingency foresee a sudden although short-lived drop in steel demand of from 30 to 40 per cent and a concurrent reduction in munitions production of

(OVER)

from 50 to 70 per cent. Closely allied with the repercussions of these sharp recessions in industrial activity are delicate questions of price and employment.

The entire problem of easing the shock of a European armistice is so vitally important that it deserves every bit of attention manufacturers can give it without interfering with actual production for war. —pp. 59, 62

* * *

WINDOW DRESSING? Much of the squabble between the military chiefs and Donald Nelson is over the "window dressing" of war production reports. The former hold that a report showing that overall production is almost on schedule may hide from public view the fact that the output of a critical item such as, for instance, heavy trucks may be lagging dangerously.

The true state of affairs seems to be that most of the behind-schedule items are ones for which the army chiefs have recently increased the demands sharply. There hasn't been time for industry to catch up with the expanded schedules.

No one can blame the war managers for crying "wolf", but the truth is industry is producing at a high rate. Steel ingot output in July did not set a new record, but it was higher than that of June and of July last year and is extremely good for a hot month. —pp. 63, 90

* * *

OFF TO GOOD START: While Congress has yet to consider the various bills submitted to control the disposal of surplus war property, the Surplus War Property Board created last February by executive order is making gratifying progress in formulating policies for this tremendous undertaking.

So far every regulation issued by the board seems to be in harmony with the basic idea of disposing of surplus in a way that will help private enterprise to get into postwar production with the least possible interference. Already the board has designated certain government agencies to handle specific portions of the disposal problem and it has formulated a price policy covering the disposition of government-owned machine tools.

SWPB has made a good start. It is to be hoped that the Colmer, Johnson or other surplus property bill which Congress eventually will pass will be as sound as the initial policies announced by this board. —p. 68

MEANINGLESS PLEDGE: One of the queerest aspects of the present wave of unauthorized strikes is the strong intimation by CIO that the operators of the Philadelphia transit system were at fault for not fighting more vigorously to "break" the strike in the city of brotherly love. Up to this time the attitude of CIO and of the present government administration had been that the employer should fade out of the picture when a strike occurs and should permit the union and the government to work out a settlement under the new deal interpretation of the Wagner magna charta.

The growing apprehension of CIO regarding "unauthorized" strikes is understandable. The much publicized "no strike" pledge of CIO and A. F. of L. was an impressive gesture but it has meant little in the suppression of work stoppages. The epidemic of strikes since invasion day in France means only one of two things: Either the responsible union leaders are lamentably weak on discipline or they are giving under-cover encouragement to those who strike.

History will record this as one of the sordid chapters of the story of the war effort. —p. 64

* * *

HIGH SPEED MILLING: This war has brought about spectacular improvements in milling machine operations. With carbide-tipped cutters and in accordance with recently developed practice it is possible to produce superior finishes at speeds and feeds heretofore considered fantastic, if not impossible.

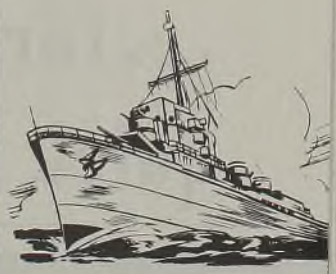
The new technique involves the greatest possible all-inclusive rigidity of machine, cutter, arbor, fixture and work; careful selection of speeds; a heavy "chip load"; climb milling or plunge cutting; and constant momentum.

These requirements can be met on standard machines by using suitable carbide-tipped cutters, increasing the diameter of the arbor and otherwise assuring rigidity and mounting one or more flywheels or "momentum" wheels on the arbor to provide constant momentum.

Results to date tag this technique as one of the major developments in machine tool practice arising from World War II. Undoubtedly it will influence the design of future milling machines. —p. 92

E. L. Shaner

EDITOR-IN-CHIEF



Save fighters' lives—buy more War Bonds.

Mrs. Edward N. Gosselin, mother of Ensign Gosselin, christening the destroyer escort named in honor of her son.

Destroyer Escort Named for Inland Hero

A few weeks ago a sleek destroyer escort vessel slid into the water at the Defoe Shipbuilding Company's yard at Bay City, Michigan. It was the USS Gosselin, named in honor of Ensign Edward W. Gosselin who was killed during the attack on Pearl Harbor. He left Inland Steel Company in October, 1940 to enlist in the U. S. Naval Reserve. His was the first gold star placed on the Inland service flag.

It is interesting and also fitting that Inland steel was used in constructing the USS Gosselin. Since that day of Japanese treachery, Inland has supplied hundreds of thousands of tons of steel for cargo and naval vessels of many types—ships constructed on the Great Lakes, at river yards, and at tidewater.

Inland will continue to produce steel at maximum capacity for the war effort until Victory is ours. We look forward then to helping build the better peacetime world for which our boys are fighting.

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Bell-Belgrade 1412; Keystone-West 1644

BUFFALO.....40 Stanley St.
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American infantrymen sweep through a French town in pursuit of fleeing Germans, passing a Nazi truck knocked out by artillery fire. Many consider speed of allied advance omen of early victory. Signal Corps photo

What Will Happen in Steel Should Germany Collapse Suddenly?

Demand expected to drop 30 to 40 per cent temporarily with predictions being made of 50 to 70 per cent cut in munitions production. Large stockpiles indicated but demand likely to expand steadily in step with civilian goods resumption

By B. K. PRICE
Associate Editor, STEEL

RAPID deterioration of Germany's military pos'tion under the hammer blows of the Allies on the East, West and South has everyone guessing as to when the war in Europe will end. Some observers are so optimistic they are predicting the Nazi collapse as early as Labor day. Others, only slightly less optimistic, think Hitler and his gang will throw in the towel late in October or early November. The less confident think the whole thing will go on into the early months of 1945.

Pure guessing, of course. Nevertheless, it is clear that the enemy's "knees are buckling," as War Mobilization Director Byrnes said a few days ago, and anything can happen. Whether the war in Europe ends Labor day or early next year it is as certain as anything can be that Nazi resistance is in its closing phases and that in all probability when the collapse comes it will come suddenly. In such case, what will be the steel industry's market position when the last shot is fired and ordnance and munitions demand drops off as much as 50 to 70 per cent?

Informed opinion in the steel industry leans to the view that a German collapse in the near future will find the nation with a tremendous tonnage of surplus steel on its hands. One authority advances the idea that this surplus may run from 18,000,000 to 20,000,000 tons and possibly may even top 25,000,000 tons. It is pointed out that theoretically under CMP regulations there should not be more than 60 days' supply on hand, which would mean about 10,000,000 tons. However, limitation of stocks to 60 days has been extremely difficult to enforce, and while exact data are lacking it would not be surprising if stocks were found to be at least twice that large. One well informed steel man recently expressed the view that at least six months' supply of steel would be found on hand should the war end suddenly.

Thinking generally in the steel industry is that once the German phase of the war is over steel demand will drop 30 to

40 per cent temporarily. At the current rate of production this would mean a loss of over 600,000 tons of steel weekly. This opinion is borne out to some extent by the recent statement of Lieut. Gen. Brehon Somervell, Army Service Forces, that if Germany collapsed it would mean a drop of about 50 per cent in demand for ordnance.

General Somervell's estimate applies solely to munitions and in all likelihood is on the conservative side. At any rate, it falls considerably under the estimate of a prominent automotive industry executive who expects to see cancellation of about 70 per cent of all war work (not just that in the automotive industry) once Germany is defeated.

It is not easy to reconcile General Somervell's estimate with that of the automotive expert. However, Somervell's estimate unquestionably was made with a view to the fact that the war in the Pacific will still be going on after Germany goes down, and consequently is inclined toward a high production pitch. Thinking of industrialists can be expected to be somewhat more realistic. Reconciling the estimate of 50 to 70 per cent in munitions contraction with an expected drop of only 30 to 40 per cent in steel demand is more difficult. Possibly the wide spread here is accounted for by the fact that steel demand may be sustained in important degree by necessary civilian requirements.

Unquestionably, much will depend upon the flexibility of the regulations governing limitations on civilian goods production. If controls are quickly eased, fairly prompt resumption of civilian manufacturing can be expected with resultant substantial demand for steel, though undoubtedly in some major consuming lines considerable time will be lost pending reconversion of plants from war activities.

Looking at the situation from still another angle, there is the political aspect which merits consideration with the national election coming up this fall. If Germany should collapse before November, it is reasoned in some quarters there would be a disposition on the part of Washington to go more slowly than otherwise in choking off war production, since widespread cancellation of war contracts would result in wholesale displacement of workers from jobs. The accompanying confusion and discontent undoubtedly would put a serious crimp in new deal hopes for a fourth term, and no one expects the administration will permit anything to happen which will ruin its chances.

Sees Implement Builders Getting Break

Speculating on the assumption that collapse of the German military would be delayed until the fall, one prominent steel industry authority advances the idea that the agricultural implement and equipment builders will get an excellent break. He points out that these interests usually start buying steel in the fall for manufacturing and fabricating operations during the winter months. While the industry's requirements are not definitely known, implement manufacturers are said to be far behind on their needs and consequently should be in position to promptly fill them.

At the same time, this steel industry spokesman is of the opinion building construction requirements will get off to a slow start. For one thing, he points out, German collapse in the fall would come at the off-season for building and construction, especially the large road programs that are being projected and which eventually will provide a huge market for such items as reinforcing steel. However, by early next year he believes there should be considerable upswing in building and construction.

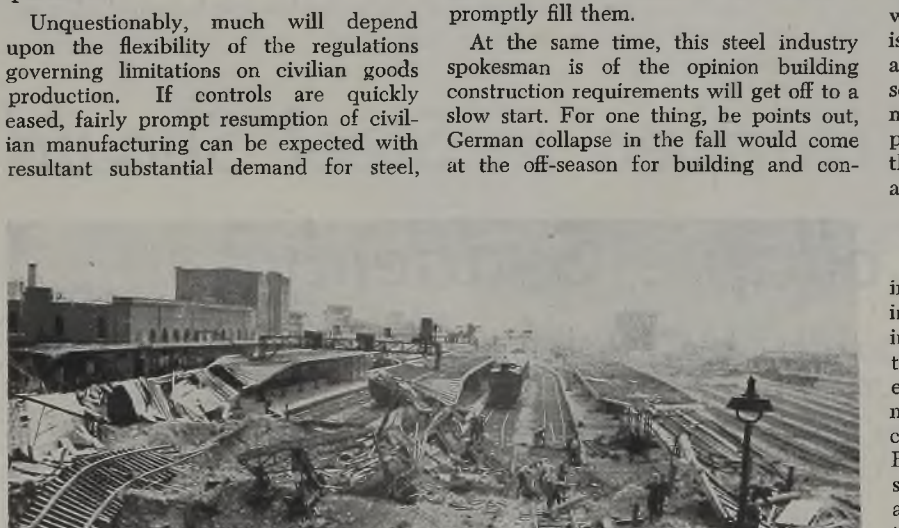
Some steel men are looking for a sharp jump in railroad steel demand almost immediately upon termination of the German war. If the end should come this fall it would catch the carriers in their off-season for buying, but, nevertheless, it is believed the rail program has been so sharply curtailed as a result of the diversion of steel and facilities to shell work, it wouldn't be at all surprising if heavy rail orders were entered on mill books and placed immediately in production. Normally, of course, there is quite a rail buying movement late in the year principally for late winter and early spring rolling, but usually, May is the big rail rolling month.

Whether the German collapse would be immediately followed by a spurt in railroad rolling stock buying is not clear. Some steel men think that should the European war end in the near future it would be found that despite the fact domestic car buying has been under normal (at least not as heavy as the railroads thought it should be), that the pressure on the roads would ease to such extent existing equipment will prove adequate for a while. There is another side to the story, however. While the railroads have been able to do wonders with existing freight car equipment, it is believed that at the first opportunity a considerable number of cars will be scrapped, for the reason that repairs in many cases have long since reached the point where it is not economical to make them, except under such circumstances as have prevailed during the war.

No Immediate Spurt in Offing

Consequently, while there may be no immediate spurt in freight car buying, in all likelihood there will be a notable increase as time goes on. For a long time past freight car buying with few exceptions has been well below normal. Throughout the depression freight car buying indeed was exceedingly light. Buying in 1940 and 1941 took a spurt, with orders amounting to around 67,000 and 121,000, respectively. Buying in 1936 was also outstanding at around 70,000 units. However, all other years since the late 20s were well below the average of these years. Last year, for instance, orders were around 41,000 and in the year before that approximately 26,000, reflecting government restrictions on the use of steel and other materials for freight car construction. The poor years in the 30s, of course, were attributable to poor times in general.

Car builders look for the first spurt to come in passenger car buying. Since this country entered the war passenger car buying has been virtually nil, due to government restrictions on materials.



Uprooted tracks, blasted rolling stock and destroyed engine sheds mark the rail center at Caen, France, as Allied engineers move in to repair their own destruction. Rehabilitation of devastated areas will require a huge quantity of steel. NEA photo

here is a very clear shortage of equipment of this type. The motive power situation, however, is believed to be fairly good shape.

For some time past there has been substantial buying of rolling stock by the armed services for export. Only recently approximately 35,000 freight cars of one type or another have been placed by the army (although distribution has not been formally announced), and there has been further locomotive buying. In the event of the early termination of the war in Europe it is believed that orders for this equipment will continue to stand, as it will be badly needed in rehabilitation work.

Tremendous Demand for Autos

As for automobile construction, much depends on how quickly and to what extent the government permits the industry to resume normal activities. Steel men point out that if the government limits automobile output to something like 2,000,000 cars annually to begin with, as has been talked in Washington, that would mean an outlet for possibly 3,000,000 to 4,000,000 tons of steel. This amount would be too small in relation to the size of the automotive industry as a peacetime steel consumer, especially should the industry concentrate on lightweight cars to start off.

Although the container manufacturing industry's season now is nearing an end, it is believed that should the European war end this fall a substantial steel buying movement will be instituted by the various manufacturers. Normally, the canmakers do some buying late in November and early December. To what extent the buying movement this fall will develop, however, will hinge upon the easing of governmental limitations.

There appears to be some uncertainty in the steel industry with respect to exportation of steel upon the termination of the German war. One spokesman for the industry says he is "at sea" at the moment with respect to a pickup in export business once the Germans quit. Eventually, however, there is certain to be a heavy movement out of the country in his opinion, but just how quickly this will develop he is not sure. He admits that there will be a lot of rehabilitation work to be done in Europe, for instance, but just how soon things can become sufficiently organized to permit reconstruction is a question. In this connection, he remarks that the British have more steel at their disposal than prior to the war and probably will be in the rehabilitation picture to considerable extent.

At the moment not much is being said openly about the matter but the subject of steel pricing in the postwar era, nevertheless, is being given serious thought. Whether government control of the price structure will continue is not certain, but one of the industry's prominent authorities is of the opinion that in the early postwar period it would not be surprising if the industry is confronted not only with continued maximum price regulation but also the establishment of a minimum price schedule. He said this is being discussed quietly in some quarters in Washington and in his view if such a policy is effected it will be "one whale of a long time" before the nation is able to shake off government price control.

For the most part opinion in the steel industry varies as to how long a time will be required after the German collapse for an upturn in steel production to get under way. As previously pointed out, much will depend upon how speedily government limitations and controls on civilian goods are lifted and upon what progress will have been made by that time in setting up machinery for facilitating war contract terminations. So far as the steel industry is concerned its conversion problem hinges very largely on how soon the industry's customers can shift from war to peace production. Some informed trade authorities look for a two to three months lull after cessation of European hostilities before there will be any pronounced upward swing. Other observers, however, think it may come sooner. Many steel men regard the automotive industry as the bell-wether and think much will depend upon how fast and to what extent the automobile builders will be permitted to resume normal production before the defeat of Japan. In this connection it is significant to note that some of the leading automobile companies are reported purchasing and leasing additional plant facilities to enable them to increase their civilian output quickly should limitations on such production be lifted while their present plants are still heavily engaged on production of goods for the Japanese war.

Lincoln's Renegotiation Suit Ordered to Trial

Federal district court in Washington has ordered to trial on its merits Sept. 27 a suit in which the Lincoln Electric Co., Cleveland, seeks to prevent the government from collecting more than $3,000,000 claimed in excess profits. The Secretary and Under Secretary of Navy had asked a summary judgment against the company.

While not ruling on the constitutionality of the Renegotiation act, the court contended the company had a right to trial.

Present, Past and Pending

■ RHEEM TO OPERATE SHELL PLANT IN PENNSYLVANIA

WILLIAMSPORT, PA.—Rheem Mfg. Co. has concluded negotiations to operate a plant here to produce 8-inch projectiles for the Philadelphia Ordnance District. The government will buy the plant and lease it to Rheem, which will equip it for shell machining.

■ REPUBLIC LIGHTS NEW STACK AT CHICAGO

CHICAGO—Republic Steel Corp. lighted the 1200-ton blast furnace at its new $90,000,000 DPC integrated steel plant in South Chicago Aug. 8, tapped first iron Aug. 10. Stack has 27-foot diameter hearth and annual capacity of 450,250 tons.

■ SHIP DELIVERIES LOWER IN JULY, SEVEN MONTHS

WASHINGTON—Ship deliveries by Maritime Commission yards in July were 126 units, aggregating 1,274,433 deadweight tons. For seven months, deliveries were 990 units, totaling 9,901,984 tons, compared with 1037 units and 10,483,331 tons in first seven months of 1943.

■ ROCKET SHELL MOTORS BEING MADE IN DETROIT

DETROIT—Motors for heavy-caliber rocket shells of the new type used on invasion barges have been in production for the past several months at the Nash-Kelvinator plant here.

■ SOFT COAL STOCKPILES RISE FOUR MILLION TONS

WASHINGTON—Soft coal stockpiles of industrial consumers and retailers increased four million tons in June to 59 million tons on July 1. Stocks still are 14 million tons below those on hand July 1, 1943.

■ MACHINE TOOL SHIPMENTS OFF, BACKLOGS UP

WASHINGTON—Machine tool shipments for June totaled $41,331,000, a slight decrease from the May figure of $41,819,000. Unfilled orders on June 30 totaled $192,782,000, compared with $185,746,000 on May 31.

■ STEEL CORP. SHIPMENTS FOR 7 MONTHS AT NEW HIGH

NEW YORK—Finished steel shipments by United States Steel Corp. subsidiaries in July totaled 1,754,525 net tons, an increase of 16,756 tons from June and 93,763 tons more than in July, 1943. For first seven months this year, shipments totaled 12,387,379 tons, compared with 11,700,778 tons in 1943.

Government Price Control Policy In Transitional Period Awaited

Constructive action needed to assure industry of position in reconversion period. Extent of regulation uncertain but likely to include such raw materials as steel. Some higher levels expected including 10 per cent rise on steel

WASHINGTON

AS ADMINISTRATION officials, spurred by the rapid progress on the European fronts, intensify their preoccupation with the problems of industrial reconversion from war to peace, they feel increasingly that one of the most pressing needs in the immediate transitional period will be an intelligent system of price control.

This need has been pointed out by many manufacturers who say that unless they know what the government proposes to do about prices when war production starts to taper off on a large scale they may as well close up shop when their war contracts are terminated and go fishing. They will not be on safe ground in planning production of peacetime goods, they say, until such time as they know what prices they will be permitted to charge for those goods.

A number of important conclusions already have been reached. The major one is that prices in the transitional period must be under such measure of government control as the responsible parties believe to be necessary. As Chester Bowles, OPA head, recently put it (STEEL, July 10, p. 60), the government must provide now to "protect and support the level of prices and wages" in the transitional period.

Possesses Full Legal Power

The second conclusion is that the government already has full legal power to control prices in the transitional period. During this period we still will be at war with Japan, and, under the war powers granted by Congress, the President will have full power, through the Office of Economic Stabilization and the Office of Price Administration, to control prices until the war is totally at an end. While Congress is in the throes of enacting a reconversion law, this law, administration officials say, is not needed for price control in the immediate transitional period.

Third conclusion is that no satisfactory degree of prosperity in the postwar period can be attained without full encouragement of the private enterprise system. The government can, and will, supply a public works program, varying in volume to meet varying needs as of a given time, but this, it is generally agreed, would not prove at all sufficient to bring about the level of productivity and employment that will be needed.

The fourth conclusion is corollary to the third, namely, that prices in the immediate transitional reconversion period must be figured on a cost-plus-a-profit basis. It is generally realized that if industry is to survive and flourish after the war begins to taper off it must be permitted to earn a profit.

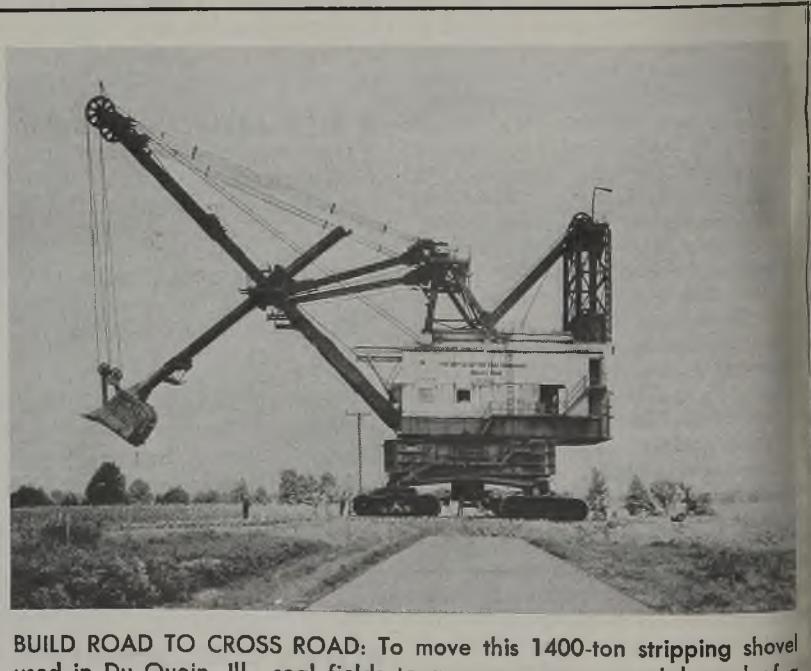
Prices Will Be Controlled

Beyond these basic conclusions there still is a great deal of ground to be gone over. There is the question whether price control should be extended to all commodities in the immediate transitional period, or only to those that absorb large percentages of the national income. It goes without saying that prices of such items as automobiles, household refrigerators and washing machines will be controlled. On the other hand, there is still uncertainty as to whether price controls should embrace many thousands of items in the "gadget" category such as can openers, coat hangers, fishing tackle. Present thinking tends to the opinion that to include such items in the controlled price structure would make the system too cumbersome, also that prices on all these "gadgets" will seek their proper level under the stress of competition. But details of this character still remain to be worked out.

Government officials have devoted considerable discussion to probable costs of production in the transitional period as contrasted with 1940 costs. In particular they have given much consideration to estimates by manufacturers that due to higher labor and other costs they will have to get anywhere from 20 to 35 per cent more money for their products in the immediate transition period—as they see it now—than they obtained in 1940. A number of important radio manufacturers, for example, have declared that they will have to advance their selling prices by some such percentage in order to stay in business when they again sell to civilians. These estimates have been greeted in Washington with at least some degree of skepticism. Government officials are fully aware that much progress has been made in bringing down production costs during the war, and they believe that this experience will at least partially compensate for higher labor and other manufacturing costs. Too, they know that with many manufacturers it will not be a case of again starting up the old civilian production lines, but rather of building new production lines from the ground up. Thus, many of these manufacturers will have the opportunity to lower costs by incorporating their experience in the new production lines.

In other words, there so far has been no acceptance in Washington of the claim that prices on civilian goods will have to be 20 to 35 per cent higher in the postwar transitional period than they were in 1940. Prevailing opinion is that they should be higher—but how much higher remains to be seen.

Washington officials take the attitude



BUILD ROAD TO CROSS ROAD: To move this 1400-ton stripping shovel used in Du Quoin, Ill., coal fields to a new seam, a special road of a mat of logs was needed to support the shovel until it could again rest on rock or coal. NEA photo

that to set up a price structure for the postwar transitional period that will hold water it will be necessary to start with basic raw materials. For example, a manufacturer of household refrigerators usually buys many parts including fractional horsepower motors, castings, forgings, etc. He cannot set a price on refrigerators until he knows what he will have to pay for fractional horsepower motors, castings and forgings. The manufacturers of those parts do not know what prices to quote until they, in turn, know their costs. On the basis of this reasoning, prices on finished rolled steel sections will be among the first to be considered. So extensively are these steel products used as raw materials in the fabricating industries that a host of manufacturers will be utterly unable to complete their postwar manufacturing plans until they know what they will have to pay for steel.

It is certain that steel prices will be higher in the immediate transitional period than they now are. On the basis of the best information now obtainable, a 10 per cent increase over present prices may be needed on many steel products. This estimate does not make allowance for any increase in pay which the steelworkers might get as a result of the steel wage case now before the National War Labor Board. If the steelworkers succeed in getting any increases from their present demands, it is difficult to see how an immediate general advance in present steel prices could be avoided. In that event, the increase necessary to meet conditions in the transitional period would necessarily be more than 10 per cent over existing prices.

Most Products Sold at Loss

As is well known to the steel industry, most steel products are being produced and sold at a loss ranging from $3 to $5 a ton. The products on which such losses are being taken include plates, bars, shapes, hot-rolled sheets, wire rods, galvanized sheets, common wire products, rails and all carbon semifinished steel. In other words, a large part of the current steel production is being sold at a loss. That the steel industry has remained intact despite this anomalous situation is explained as follows:

1. Steel companies generally have departed from their normal peacetime practice of surrendering certain extras and differentials in order to get tonnage. Under the wartime pressure of production they now are able to secure all the extras and differentials to which they are entitled. They benefit to the extent of $5 to $7 a ton on the average from charging all that the ceiling price structure allows, but this still does not prevent them from being $3 to $5 in the red on many tonnage products. It has helped the overall profit picture, however.

2. Most tonnage producers of steel have profitable war contracts for manufacturing shell forgings, armor plate, machine gun clips, for building ships and other fabricated items, and these "sweeteners," plus such specialty quality products as Navy plate and armor-piercing projectile steel, make up the losses on their sales of common steel products at ceiling prices.

3. A number of steel companies which do not earn profits on such "sweet" items are allowed to charge higher-than-ceiling prices which are calculated to allow them an overall profit equivalent to their average in the years '36 to '39.

It generally is accepted as a fact that the end of the war with Germany will be followed immediately by the termination or sharp cutback of many war contracts and that almost overnight there will be a serious drop in steel ingot production. There is no positive knowledge in Washington as to just how much of a drop there will be. Rough estimates as to what amount of war business will be canceled at that time are taken to make it reasonable to suppose that in the immediate ensuing period steel ingots may be produced at around 60 to 70 per cent of capacity.

Some Costs Would Be Cut

A number of things probably would happen at that time. Labor costs per ton probably would be reduced as a result of elimination of overtime payments at one-and-a-half and double-time rates. The price of scrap perhaps would reflect a declining trend. Inefficient mills probably would be closed down. On the other hand, basic wage rates probably would be unchanged; overhead expenses and depreciation would have to be spread over a smaller tonnage output; the steel companies probably would lose most of the "sweet" work which has enabled them to sell steel at a loss during the war without coming out on the wrong side of the ledger. No decline probably could be expected immediately in costs of iron ore, limestone, coal, coke, petroleum products, refractories, equipment and supplies.

In other words, savings on overtime labor and on scrap probably would be a counter-balance in other items of cost at the least, with the likelihood that losses might be slightly larger than at present. It has been said, especially in labor circles, that the steel companies can reduce their costs by acquiring efficient new steelmaking facilities erected at government expense during the war. This would not be possible unless the government-owned plants were sold at far less than they originally cost. A study of the steel industry capital structure discloses that the average investment in a fully integrated steel plant is roughly equivalent to the value of a year's output from that plant at capacity operations.

But new iron and steelmaking capacity built during the war has cost three times as much as during normal peacetime periods. A wartime-built plant with capacity for producing $40,000,000 worth of product a year at present prices, for example, cost $120,000,000 to build. A company buying this plant for $120,000,000 would be under the necessity of charging three times the normal depreciation of the industry.

Another way of stating it is that an operation showing $5 per ton profit after a $4 per ton normal depreciation charge would show a $3 per ton loss after a $12 per ton depreciation charge.

Unless special factors are involved, therefore, steel companies could not afford to pay more than one-third of the original investment in government-owned plants and operate these plants in competition with efficient plants erected at prewar costs. On some government-owned plants that are less favorably located with reference to peacetime consuming centers the steel companies could afford to pay even less.

This is a problem now being studied by the Surplus War Property Administration, but it still remains to be seen whether the efficient plants built by the government at high costs during the war will be made available to the steel industry for postwar use on a cost basis within the means of steel companies.

Some thought has been given to the possible desirability of setting floor prices under rather than ceiling prices over steel products in the immediate transitional reconversion period. This would be for the purpose of discouraging a deflationary trend of the type that followed the first World War.

The Office of Price Administration, as the agency for determining price policies for the transitional reconversion period, will call on industry extensively for advice.

July Ingot Production Gains Over June and Last Year's Marks

During July the steel industry produced 7,474,297 net tons of ingots and steel for castings, the American Iron and Steel Institute reports. This was almost 260,000 tons greater than June output of 7,217,232 tons and also exceeded the total of 7,407,876 tons made in July, 1943.

Open-hearth furnaces produced 90 per cent of total output in July and operated at 97.6 per cent of capacity. Bessemer steel production was at 80.9 per cent of capacity and electric furnace steel at 74 per cent. In July, 1943, open hearth production was at 96.8 per cent, bessemer at 90.6 per cent and electric furnaces 91.9 per cent.

In July the industry operated at 94.4 per cent of capacity, against 93.9 per cent in June and 96.2 per cent in July, 1943. Weekly output in July was at an average of 1,691,017 tons, compared with 1,682,338 tons in June and 1,675,990 tons in July, 1943.

"Minor" Work Stoppages Costing Nation Heavily in Critical War Equipment

"For the want of a nail the shoe was lost, for the want of a shoe the horse was lost, for the want of a horse the rider was lost, for the want of a rider the battle was lost, for the want of a battle the kingdom was lost—and all for the want of a horseshoe-nail."—Benjamin Franklin.

IN THE eleventh hour of the war, when military leaders are calling for the last pound of materiel to bring the Axis to its knees, production of the most vitally needed equipment is being lost because of strikes.

This loss cannot be measured by the number of workers involved; the number out at any one time is small in relation to the total at work. Nor can the loss be measured by the duration of the stoppages; generally they are brief.

In the Philadelphia transit strike, only 6000 transit workers were involved. Affected, however, were 2,000,000 people, 900,000 of them war workers. The War Department estimated one-third of the war workers were kept away from their jobs. For six days, production of radar, heavy artillery, heavy ammunition, military trucks, incendiary bombs, flame throwers and other critical supplies needed by the Army was seriously affected. Important wartime activities were also affected at the Frankford Arsenal, the Philadelphia Quartermaster Depot, the Philadelphia Ordnance District (a supply nerve center) and the Philadelphia Signal Depot and the Storage and Issue Agency, the latter two Army funnels for frontline materials.

The extent to which war plants outside Philadelphia were affected is hard to estimate for stoppages in key industries have a way of fanning out to disrupt operations in an incalculably wide circle of other plants.

A similar example of the widespread effects of a minor strike recently was brought to light in San Francisco. A handful of machinists at the Federal Mogul Corp.'s bearing plant walked out because the company had allowed some workers to work overtime, which was contrary to a union-made ban. Production of bearings was obstructed. Federal Mogul supplies bearings to the Joshua Hendy Iron Works at Sunnyville, Calif., which in turn supplies turbines for troop transports to the California Shipbuilding Corp. at Los Angeles.

California Shipbuilding, working on a fast and tight schedule, telegraphed the War Labor Board: "The least delay in the delivery of any necessary part to complete a component part used in the ship will undoubtedly delay our schedule of production. This strike of the machinists is serious with the Joshua Hendy Iron Works and in turn will affect this yard."

These examples indicate the fallacy in the statements of the Department of Labor which measures the man-hours lost through strikes only in terms of the time lost by the strikers themselves and permits administration spokesmen to minimize the importance of wartime strikes by announcing that only a fraction of 1 per cent of the total time worked was lost by strikes.

Feeling of Urgency Needed

While these and other stoppages were retarding production, WPB and military leaders were making urgent pleas for more equipment.

Lieut. Gen. Brehon Somervell of the Army Service Forces warned that the war's fast tempo would have to be slowed unless production were stepped up and said a return to the 1943 feeling of urgency is needed.

With a sheaf of requests for increased weapons from field commanders before him, General Somervell listed the following increases needed: Heavy artillery, 45.7 per cent more in last half than first; artillery ammunition, increase from 500,000 rounds in May to 2,500,000 monthly; trucks, increase of 65.9 per cent in last half; bulldozers and tractors, increase of 141.7 per cent in last half; cranes, increase to reach peak of 208.5 per cent of first half average.

WPB Chairman Donald M. Nelson's report on June munitions production also shows a need for increasing output sharply in numerous items and reveals a slackening in the war effort in recent months, due not only to strikes but to absenteeism and general unwillingness on the part of workers to produce to capacity.

Often the latter is due to union "featherbedding" restrictions. Last week

the WPB asked for a moratorium on practices of the United Rubber Workers limiting heavy tire production at Akron, O. Manufacturers had informed WPB officials that production of the heavy tires, now one of the most critical items, could be increased 15 per cent if the union's restrictions on production were removed. A staff of WPB officials is investigating the situation in Akron.

If complaints of the limitation of tire production due to the union's "featherbedding" practices prove justified, it is understood WPB will undertake similar investigations in other industries where need for greater output is urgent. Some manufacturers have said production could be increased one-quarter to one-third with their present labor forces if the "featherbedding" conditions were corrected.

Manufacturers at Detroit—long known as the motor capital but now being dubbed the "mother capital" because of its steady labor pains—particularly have pointed out the lowered production due to failure of the workers to give a normal day's work for a day's pay. Here in the cradle of the "sitdown", a serious stoppage was in effect last week when 7000 employes at five plants of the Chevrolet Gear & Axle division of General Motors walked out a second time only a day after ending a 12-day suspension. Reason for the second strike was the discharge of seven union officials involved in the earlier suspension.

Production of aircraft engine, truck

War workers line up to enter special Navy buses to be transported to their jobs during the Philadelphia transit strike. The strike of 6000 employes affected 2,000,000 people, of which 900,000 were war workers. NEA photo

and tank parts was seriously affected and operations of other GM divisions in Tonawanda, N. Y., Pontiac, Mich., Norwood, O., Atlanta, Ga., and St. Louis were in danger of being curtailed because of lack of components supplied by the Detroit plants.

Charging General Motors with attempting to destroy the power of the United Automobile Workers-CIO, Walter P. Reuther, director of the GM division of the union, made a significant statement when he said, "We do not feel the showdown with General Motors Corp., which must come sooner or later, should be fought under circumstances and in an atmosphere favorable to the corporation."

Other strikes contributing to the slackening in materiel output generally were for minor or even silly reasons.

At St. Louis, 1200 workers of the St. Louis Car Co., making amphibious tractors for the Navy, were off the job. Originally a wage dispute, the district representative of the United Steelworkers Union was quoted in the press as saying that a flock of "evil-smelling" sheep grazing near the plant had increased dissatisfaction of employes.

Several thousand truck drivers were idle in eight midwestern states, Minnesota, Iowa, Illinois, Kansas, Missouri, Nebraska, North and South Dakota, due to a wage adjustment dispute.

Eighteen hundred workers struck at the National Aluminum Cylinder Head Co. at Cleveland after a plant manager was dismissed.

Approximately 3000 were out at the Wright Aeronautical plants in Fair Lawn and Paterson, N. J., as the result of transfer of some workers to lower-graded jobs.

Two thousand were involved in two stoppages at the Houde Engineering Division of the Houdaille-Hershey Corp., Buffalo. One stoppage lasted a day and a half and the other three days. Wages were at issue.

Approximately 300 employes of the Acme Steel & Malleable Iron Works, Buffalo, stayed out two days, protesting the disciplining of a foreman.

Production of two top urgency items, turbines for aircraft carriers and hydraulic presses for shellmaking, was halted for two days by a walkout of 250 workers at Lake Erie Engineering, Kenmore, N. Y., protesting delay by the WLB in acting on a wage case.

Electric melting department of Allegheny Ludlum Steel Corp., Dunkirk, N. Y., was disrupted for three days in a pay deduction dispute.

A total of 23 strikes by small groups of cranemen at Jones & Laughlin Steel Corp.'s Aliquippa, Pa., works in a little more than a month caused a loss of 750 tons of ingots, 7100 tons of rolled steel, and 1750 tons of seamless tubing.

Strikes at Mesta Machine Co. and the Pennsylvania Transformer Co., both of Pittsburgh, have held up the production of heavy artillery and bombs, respectively.

At Detroit, several hundred men were idle at the Gear Grinding Machine Co.

A walkout of 5700 men at the John A. Roebling Sons Co., Roebling, N. J., and Trenton, N. J., over the discharge of nine men, caused a loss of 3000 tons of ingots and set back schedules of finished products ten days or more.

Nine hundred workers at the American Can Co., Jersey City, N. J., struck because the company employed some part-time workers, reducing the amount of overtime for full-time workers.

Three hundred walked out at the Newark, N. J., plant of the Breeze Corp., dissatisfied with a WLB decision on wage increases.

Four thousand staged a walkout at Kelsey-Hayes Wheel Co., Detroit, over a change in starting hours.

Panel Preparing Report On Steel Wage Case

Special steel wage case panel of the National War Labor Board, having completed the taking of testimony both from the employers and from the United Steelworkers of America on the union's demands, is preparing its factual findings. Its report is expected to be submitted to the NWLB late in August. Next step will be the board's decision on the findings of fact. This decision is expected sometime before the end of September.

Large Steel Tonnages Made Available by Inventory Cuts

A substantial tonnage of steel for use by war industries has been obtained in a drive to reduce all inventories of heavy consumers to a practicable minimum working level and by canceling mill orders where possible.

Preliminary report from the fifth region of the War Production Board shows that 108,220 tons of carbon steel were obtained through returns of CMP allotments and that actual carbon steel mill orders for 60,754 tons were canceled. In addition, 17,544 tons of alloy steel were obtained by return of CMP allotments and 12,365 tons of idle steel were added to the WPB regional redistribution department inventories.

Indications are that the final total of steel made available in the five-day drive in the Cleveland district, ended July 29, will be considerably larger following closer scrutiny of inventories for large holders and order backlogs.

PEC Staff's Experience Indicates Cutbacks Not Yet Real Problem

Workers and equipment displaced when contracts are reduced quickly absorbed by other work. Expanding munitions programs create need for 200,000 additional workers. Majority of reductions cause no release of employes

EXPERIENCE of the Production Executive Committee staff of the WPB during its first six weeks of reviewing the placing of production cutbacks indicates that such cutbacks are not now a significant problem.

The PEC staff, composed of representatives of the War and Navy Departments, War Manpower Commission, Maritime Commission, Smaller War Plants Corp., and various branches of the WPB, has authority to review the placing of all cuts in production involving $1,000,000 or more over a four-month period after the procurement agency has determined the necessity of reducing or ending the program. The agencies are obligated only to inform PEC of cases involving smaller cuts.

Between June 15, when the PEC staff started functioning, and Aug. 1, a total of 216 cutbacks was reviewed. Of these, no employes were to be released in 130 cases and in an additional 35 cases the number of workers to be laid off, if any, was unknown. During the six weeks, the information supplied to the PEC staff was that the cutbacks would result in the lay-off of a total of 14,925 workers out of a total munitions labor force of slightly less than 10,000,000, and half of this number was concentrated in four cases. Some of these workers will not be released until the beginning of 1945.

Need 200,000 New Workers

During the same period, WMC reported that increased requirements for ammunition, heavy trucks, tanks, shells, heavy duty tires, and certain secret projects, among others, created a need for an additional 200,000 new workers. In many cases, the procurement agencies were able to place contracts for these items in plants where cutbacks were occurring. In others, the PEC staff did not recommend new contracts because of the tightness of the labor area and the local need for any workers released.

In most instances, workers and equipment displaced are being quickly absorbed by other work in the plants where the cutbacks occurred. In 52 cases—about 23 per cent of the total—the workers affected by the cutback were either shifted to other contracts held by the plant or transferred to work on new contracts placed as a result of action initiated by the military subcommittee of the PEC staff. In 15 other cases the cutback relieved the company of the necessity of recruiting new workers, while in an additional 58 instances the managements reported that no workers were being released without explaining how they were to be absorbed.

In two cases the managements reported that no workers were being released, that the workers were being transferred to civilian production. Several plants reported that normal turnover would make it unnecessary to lay off any workers.

In most cases in which workers were released, the number was small. Nearly one-half of the plants where cutbacks caused layoffs reported less than 100 would be affected. Most of these were in tight labor areas where the finding of other war work represented no problem.

In the six-week period ended Aug. 1, there were four cases in which more than 1000 workers were affected. In the case involving the largest number of workers—the cutback of bombsight production at a Navy-operated plant at Elmira, N. Y., where 3600 were employed—the PEC staff lists all Elmira workers among the 14,925 reported to be laid off although actually other important war contracts, placed in the plant after only several hundred had been released, will provide jobs not only for the 3600 who had been engaged on bombsight work but for an additional 500 workers as well.

In virtually every case in which workers were laid off, the United States Employment Service of WMC reported considerable local demand for their services by other war plants.

The Elmira case was the only large cutback approved outside a tight labor area. Other cases in which more than 1000 workers were affected were the cutbacks in aircraft machine gun production at the Colt Patent Fire Arms Co. at Hartford, Conn., where approximately 1500 employes were expected to be released, and at the Kelsey-Hayes Arsenal at Plymouth, Mich., where 1200 were scheduled to be laid off, and the termination of gun mount production at the Worthington Pump & Machinery Co. at Holyoke, Mass., affecting 1500, although many were absorbed by other work in the same plant.

DISTRIBUTION OF CUTBACKS BY STATES

State	Amount of Cutback: Number of Plants	Amount of Cutback: Value	Amount of Cutback: %	Labor Released: No. of Plants	Labor Released: Employes: Number	Labor Released: Employes: %
Total	215	$215,827,000	100.0	51	14,925	100.0
Alabama	2	1,728,000	.8	1	15	.1
California	4	3,097,000	1.4	2	457	3.1
Colorado	1	124,000	0.1	0	0	.0
Connecticut	14	11,523,000	5.3	4	1,900	12.7
Florida	2	356,000	0.2	1	226	1.5
Georgia	3	3,893,000	1.8	1	60	.4
Illinois	11	4,565,000	2.1	2	338	2.3
Indiana	5	3,033,000	1.4	0	0	.0
Kansas	1	298,000	0.1	0	0	.0
Kentucky	2	656,000	0.3	0	0	.0
Louisiana	2	2,955,000	1.4	2	140	.9
Maine	1	223,000	0.1	0	0	.0
Maryland	2	967,000	0.4	1	25	.2
Massachusetts	17	22,946,000	10.6	3	1,811	12.1
Michigan	22	18,207,000	8.4	9	2,603	17.4
Mississippi	1	868,000	0.4	1	125	.8
Missouri	5	4,905,000	2.3	0	0	.0
Nebraska	1	69,000	*	0	0	.0
Nevada	1	433,000	0.2	0	0	.0
New Hampshire	2	12,173,000	5.6	0	0	.0
New Jersey	23	22,102,000	10.2	6	900	6.0
New York	29	37,031,000	17.3	6	4,240	28.5
Ohio	31	32,850,000	11.1	5	925	6.2
Oklahoma	1	93,000	*	0	0	.0
Pennsylvania	13	20,930,000	9.7	2	65	.4
Tennessee	2	896,000	0.4	1	70	.5
Texas	6	2,254,000	1.0	1	400	2.7
Washington	2	775,000	0.4	0	0	.0
West Virginia	1	1,035,000	0.5	1	50	.3
Wisconsin†	5	7,694,000	3.6	2	575	3.9
Connecticut & New York‡	1	2,560,000	1.2	0	0	.0
Indiana & New Hampshire‡	1	589,000	0.3	0	0	.0
Massachusetts, New York & Pennsylvania‡	1	3,000,000	1.4	0	0	.0

*Under 0.05 per cent. †Includes case with no cutback until 1945. ‡Company has plants in more than one state and distribution of cutback among them has not been reported.

Restrictions on Steel Use Are Clarified

Amendments to order M-126 apply to specific items in fabrication. Changes do not reflect substantial relaxation

RESTRICTIONS on use of iron and steel in fabrication of specific products have been revised, the Iron and Steel Division, War Production Board, announced last week.

The changes, contained in order M-126 as amended Aug. 7, do not reflect substantial relaxation of restrictions in use, officials said. In most cases they merely clarify restrictions already applicable while others permit the use of special types of steel for specific products.

Some of the items may be made, as a result of the amendment, only from idle and excess steel according to Controlled Materials Plan rules or the provisions of Priorities Regulation No. 13, governing special sales of steel. Furthermore, attention is called to the fact that provisions of other WPB orders may restrict the manufacture of items on which steel use prohibitions have been lifted or modified.

Under the amended order, iron or steel may be delivered and used for the manufacture of the following items:

Aircraft fire walls, aircraft seats, aircraft toilets, floor and ceiling plates for piping, quicksilver flasks, mechanical bookbinding, parachute ripcord housing, steel wool, structural steel for home construction, thermometer cases and mountings, and umbrella shafts and handles.

The amendment also makes changes in the rules relating to the use of steel. Baskets; brewing, distilling and processing equipment for alcoholic and non-alcoholic beverages; cans, containers and closures; cheese vats; fence posts; first aid kit boxes; forms for concrete construction; furniture; hardware; gates for fences; ironing boards and stands; measuring pumps and dispensers; meat molds; milk bottle cases; children's play pens; various types of plumbing and heating equipment; railings and barriers; roller and ice skates; various types of special industrial equipment; spools for wire; household thermometer bases; tool handles; weather stripping; and wheelbarrows.

Changes in list C of the order, which relates to the use of iron and steel in products for military use, have been made to reflect the changes with respect to use of iron and steel for civilian items which are contained in list A. In addition, list C now permits use of stainless steel in thermos and insulated jugs and bottles; name data and instruction plates for machinery, equipment and aircraft; lighting equipment for aircraft; radio antenna poles for aircraft; ladders and hoists for aircraft; and lavatories and lavatory equipment for aircraft and for use on board ship.

First Half Output of Plates, 6,954,131 Tons

With an output of 1,092,703 tons in June, platemakers produced a total of 6,954,131 tons in the first half of the year, or at a rate of 87.4 per cent of capacity, according to the American Iron and Steel Institute.

Hot-rolled bar production in the first half amounted to 6,256,798 tons and cold-finished bar production 1,112,249 tons. This was made possible by an output of 993,070 tons of hot bars in June, including 250,581 tons of alloys and 171,515 tons of cold-finished.

Hot-rolled sheet production for June amounted to 1,022,132 tons, bringing the total for the first half up to 6,264,989 tons. June cold-rolled output was 309,899 tons, and for the first half, 1,819,883 tons. Galvanized output in June was 114,162 tons, and for six months, 634,650 tons.

POSTWAR PREVIEWS

CONGRESS— Industrial demobilization and reconversion measures, including unemployment benefits for displaced war workers and veterans, undergoing feverish debate in Congress. Establishment of new system of regimentation in postwar period is feared. See page 71.

CIVILIAN GOODS— War Manpower Commission granted veto power over War Production Board's program for gradual resumption of civilian goods production. Authorization for reconversion will be withheld if it would interfere with recruitment of labor for war industries. See page 72.

AUTOMOBILES— Regrouping of certain automotive interests believed underway in move to improve their positions to share in the lush market prospects which await manufacturers when car production is resumed. See page 75.

AIRPORTS— Present extensive construction of airport facilities in western hemisphere is expected to continue as a result of demands of postwar expansion of commercial aviation. United States airport facilities may be doubled in the postwar period. See page 78.

DIESEL ENGINES— Manufacturers on West Coast plan for big expansion of world-wide markets for marine and stationary engines in postwar period. Anticipate few or no troublesome reconversion worries. See page 85.

BRITISH PLANNING— Great Britain expected to continue numerous controls after hostilities end to stabilize prices and wages and direct reconversion to civilian output. See page 86.

HOUSING— Kaiser Co. and Standard Gypsum Co. form partnership for mass production of "the core of postwar houses," including interior wall panels and whole sections such as kitchen, bathroom and laundry. See page 89.

MACHINING SPEEDS— Sensational increases in milling speeds being obtained with use of carbide cutters and momentum wheels on standard machines apparently is leading to a revolution in machining methods which will have lasting effects on fabrication of products. See page 92.

POSTWAR METALLURGY— Information obtained from many of STEEL's readers indicates oldtime alloy steels will find renewed popularity after the war although the emergency types will find some favor. In selecting steels for postwar products, sight should not be lost of the fact that carbon still is a primary consideration in obtaining desired physical properties. See page 94.

AUTOMATIC TUBE MILL— Radical improvements reported in mills for producing seamless and welded tubing in the past few years. However, Russians have purchased two new resistance welding units which convert unpickled hot-rolled strip in coils into tubing and pipe on a straight-line production basis which undoubtedly will influence practice in this country. See page 104.

Surplus War Property Board Is Rapidly Formulating Policies

Headway being made by staff in determining procedures for handling mammoth job, moving ahead with little in the way of precedent to serve as guide. Important policy decisions already made in several directions

THE SURPLUS War Property Board has made a good start in formulating policies to control disposition of surplus property. Confronted with a job of mammoth proportions, and with little precedent to serve as a guide, the policy-making staff of this board has been working till late in the night, and usually seven days a week. One of its key members recently apologized for appearing for work at 10 o'clock on a Sunday morning, explaining it had been necessary for him to catch up on his sleep.

The first task of the board was to determine the procedures to be followed by the various federal owning agencies in determining and declaring surplus property. These instructions were set forth in Regulation No. 1 which was issued in May. That regulation also named the disposal agencies and dealt with the responsibilities of those agencies with respect to property declared surplus. As a result, each disposal agency was informed as to the types of surplus property it would handle.

Regulation Delegates Authority

Since then, as of July 26, the board has issued Supplement No. 1 to Regulation No. 1. In it the Tennessee Valley Authority is authorized to continue to dispose of its own surplus property. The foreign establishments of the State Department are to continue to dispose of surplus war property abroad in accordance with the department's regulation. Also, the administration is given authority to exempt surplus war property, when it so desires, from the operation of the overall disposal policies. The supplement assigns to the National Housing Agency the disposition of all surplus war housing property, clarifies the powers of the Federal Works Agency in disposing of non-industrial real property, and contains some minor amendments to the instructions set forth in Regulation No. 1.

Regulation No. 2, effective Aug. 1, established policies to be carried out by the Reconstruction Finance Corp. in the disposal of surplus real estate, other than industrial real estate.

The most important action of the Surplus War Property Board to date as far as the metalworking industry is concerned is the formulation of a price policy covering disposition of government-owned, surplus, machine tools (see STEEL of July 24, p. 60). This task, because of many engineering complexities, because of the enormous number of these tools that eventually will be available for sale, because of the imperative need that idle tools be gotten into production without delay to stimulate post-war prosperity and employment and, at the same time, because of the need for recovering for the government as much of its investment as possible, was a most difficult one.

The price schedule starts off with an

SEN. EDWIN C. JOHNSON

Author of a measure to regulate the disposal of surplus war property. NEA photo

immediate depreciation allowance of 15 per cent of the cost of the tool to the government. To this is added depreciation of 2½ per cent a month for the first six months the government has owned the machine, depreciation of 1 per cent a month for the next four months, and depreciation of 0.8 per cent per month for the next 26 months. Thus a buyer can obtain these tools at anywhere from 85 to 59.6 per cent of their original cost, depending on the length of time the government has owned them.

These are the depreciation discounts where a buyer takes possession of machine tools not located in his own plant or in a government-owned plant operated by him. When the tools are in the purchaser's plant, or in a government-owned plant operated by him, he is asked to pay 5 points higher, namely, 90 to 64.6 per cent of the original cost. This is because the party who buys tools located in a plant operated by him not only has exact knowledge of their condition, but is under no necessity of paying freight charges on them.

This price schedule, incidentally, is based on the machine tool builder's original price, inclusive of electric equipment and standard accessories, f. o. b. builder's plant. Tooling developed for the machines is available at the customer's option on the same depreciation formula basis.

The price schedule referred to above applies to standard, general-purpose tools only. Price policies for many special-purpose tools are still under study and will be announced later. In order that these policies may be effective in moving tools and get them back to work, the Surplus War Property Board makes it a practice to hold meetings with the manufacturer, consumer and distributor groups interested, and arrives at decisions only after taking all viewpoints into consideration. Special problems, for example, are involved in the disposal of cartridge case presses, foundry equipment and a vast assortment of equipment used in the airplane industry. In each case, it is felt the price policies should be devised to fit the special circumstances.

RFC Important in Disposal

One of the prime objectives of the Surplus War Property Board is to dispose of government-owned property to people and companies who can use it or put it to work, in the interest of enhanced production and employment. The board seeks to establish policies that will discourage speculators from trying to make profits on the purchase and resale of government surplus property.

Disposal of most of the surplus property of interest to the metals producing and metals consuming industries has been entrusted to the Reconstruction Finance Corp. and subsidiaries.

The Defense Plant Corp. is the agency for disposing of (1) industrial real estate including land, plants, buildings and structures—and machinery and other equipment when such machinery and equipment are integral parts of the plant; (2) plant equipment (excepting mining, excavating, construction, laundry and dry cleaning), including machine tools, motors (but not vehicles), power equipment, boilers and accessories (except valves), electrical equipment and apparatus; (3) railroad equipment; (4) aircraft, accessories, and related items.

The Metals Reserve Co. has the duty of disposing of (1) primary metals, ores, concentrates; (2) scrap; (3) secondary metals in sheets, rod, bar, wire, pipe, structural shapes, etc.; (4) valves, wire cloth and wire fabrics, metal tubing, springs, pipe fittings; (5) certain ores, minerals including natural gems, miscellaneous crude minerals, mica, quartz, etc.

The Defense Supplies Corp. dispos

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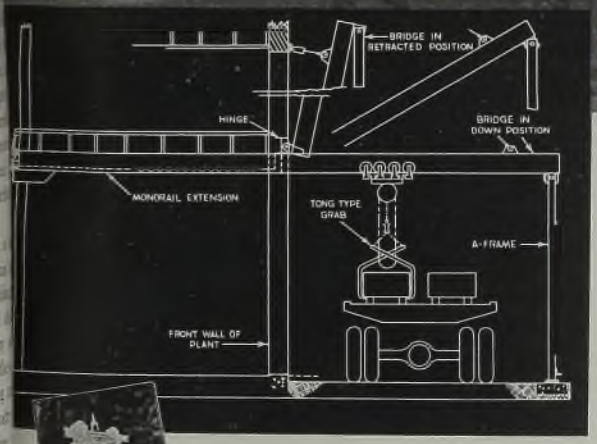

Diagram shows simple system for unloading steel. Crane is retracted against building over door when not in use.

● Steel, formerly unloaded sheet by sheet, is now transferred from trucks to storage in 3-ton bundles. Handling labor was greatly reduced and damage to metal entirely eliminated.

Simple systems like this, worked out by American MonoRail engineers to meet hundreds of operations, speed up production — lower costs — reduce accidents — release skilled hands for more profitable use. Let an American MonoRail engineer show how you can save time and money. Write today!

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of (1) hides, leather, furs, bristles, hair, cork, wool, jute, cordage fibers, silk, molasses, pulp, pulpwood; (2) building and construction materials; (3) chemicals, paints, lac, bulk drugs and medicines; (4) petroleum, coal and related products, graphite and carbon; (5) communications equipment; (6) laundry and dry cleaning equipment, abrasives and asbestos products.

The Reconstruction Finance Corp. subsidiaries have made only a modest beginning in acquiring and selling surplus government property. As of July 15 they had acquired surplus items that originally cost $181,442,667. Of these they had sold for $52,562,554 items whose original cost had been $59,004,006. That left unsold surplus property in the hands of these subsidiaries as of July 22 with an original cost of $122,438,661.

Sales and the amounts received included: CAA airplanes $4,886,295; CAA link trainers $73,648; construction, mining, excavating and related machinery $792,997; tractors $101,361; railroad transportation equipment $55,770; motor vehicles $223,363; professional and scientific instruments and apparatus $967; construction materials $5,574,610; machine tools $13,613,259; other production equipment $638,349; miscellaneous production items $177,903; scrap iron and steel castings $57,816; machine parts $480,275; plants and miscellaneous real estate $167,850; plants taken over by lessees excepting by other government agencies $25,112,451; mining operation spare parts and supplies $439,990; office, yard and warehouse equipment $4772; heavy chemicals $13,001; industrial and related chemicals $77,437; steel $36,572; nonferrous metals $8488.

Write to Regional Office

Manufacturers and others who are in need of machinery, tools, plants, and materials of one kind or other for industrial use should not come to Washington but should go in person or write to the nearest regional office of the Reconstruction Finance Corp. These are located at Atlanta, Boston, Charlotte, N. C., Chicago, Cleveland, Dallas, Tex., Denver, Detroit, Houston, Tex., Kansas City, Mo., Los Angeles, Minneapolis, New Orleans, New York, Omaha, Nebr., Philadelphia, Portland, Oreg., Richmond, Va., St. Louis, San Antonio, Tex., San Francisco and Salt Lake City, Utah.

If they will state or write their specific needs at these offices, search quickly will be launched to ascertain what can be located in government surplus stocks. The RFC disposal system throughout is equipped with an elaborate card index system. If the property sought is not to be found in the particular region in which the inquiry originates, the search is broadened to include the other districts.

Except on goods that are to be priced by the Surplus War Property Board, as general-purpose machine tools mentioned above, the disposal agencies have authority to set sales prices. For example, they may sell goods at auction, or by competitive bidding, if they so elect. The disposal agencies also have full authority to set terms of payment. Since the primary purpose is to move surplus property so that it can contribute to the economy, the agencies are disposed to grant liberal terms when they are desired. The RFC subsidiaries, for example, are glad to arrange such financial assistance as the buyer may need; the RFC is willing to guarantee bank loans within limits or, if necessary, to make loans out of its own funds.

Rep. William M. Colmer, right, chairman of the House postwar planning committee and author of a measure covering the disposition of surplus war property, chats with Eric A. Johnston, left, president of the United States Chamber of Commerce. NEA photo

A host of surplus items for disposal have been lumped under the head of "consumer goods" and anyone having needs of this character should make inquiries at the nearest regional office of the Procurement Division of the Treasury Department. These are located at Boston, New York, Washington, Cincinnati, Chicago, Atlanta, Fort Worth, Tex., Kansas City, Mo., Denver, San Francisco and Seattle. Treasury Procurement sells such surpluses as barbed wire, wire fence, nails, bolts and nuts, window glass, casket hardware, trunk and luggage hardware, box and crate stock, handles, battery charging generators, home sewing machines, coin-operated scales, radio receivers, storage batteries and many others.

War Food Administration, with offices at New York, Atlanta, Ga., Dallas, Tex., Chicago and San Francisco, sells livestock, foods, beverages, pine oil, turpentine, tobacco products, marine liver oil, vitamins, and similar products.

Maritime Commission, Washington, should be contacted for marine hardware, marine boilers, winches, capstans, compasses, small watercraft, ships, instruments, etc., also shipyards, repair yards, marine terminals, etc.

National Housing Agency, as stated above, has assignment for disposing of surplus war housing property, while the Federal Works Agency is responsible for disposing of the non-industrial real property.

WMC Terminates Use of Manning Table Plan

Manning Table Plan, which has served as a basis for orderly withdrawal of workers from war industries into the armed forces, has been terminated by the War Manpower Commission and at the same time Selective Service officials pointed out replacement schedules for the induction of the men are being permitted to expire.

More than 8700 war plants with nearly 5,000,000 workers have used the individual manning tables while industry-wide tables covering 16 important war industries were completed and placed into use. Only activities essential to the war effort were eligible. It was first instituted in October, 1942.

Replacement schedules have now been modified by the national headquarters of Selective Service to apply primarily to draft registrants from 26 through 29 years of age.

Army Finds New Steel Paracrates More Durable

New steel package for airborne field artillery operations, developed by the

Ordnance Department, Army Service Forces, is replacing plywood paracrates and paracaissons with corrugated steel crates for dropping component parts of the 75-millimeter pack howitzer.

The containers have been drop tested from various altitudes on soft sandy soil, on well packed sand and gravel, and, finally, on a concrete airfield runway, and no damage occurred to equipment contained in them. The crates, although slightly dented, were not rendered unserviceable even after being dropped on the concrete runway.

Results showed that the corrugated steel cases displayed greater strength and durability, when subjected to severe shock, than the plywood cases; that the construction and design of the steel cases simplified the packing of howitzer parts; and that the parts were afforded greater protection.

A typical paracrate measures 51 inches in length, 18 inches in width, and 17 inches in height. The container, an oval cylinder, opens into two equal sections along its long axis. The wheels of the crate, designed to expedite removal of the howitzer components from the air strip, are stored in the front compartment while ammunition for the howitzer is strapped in the rear compartment.

WPB Reduces Magnesium Production Schedules

Monthly production schedules of four magnesium plants have been reduced and that of a fifth plant terminated by the War Production Board in order to bring surplus supplies more in line with the nation's stockpile objectives.

Curtailment at these government-owned plants will result in a reduction of 7,517,000 pounds per month in magnesium production. Production has been terminated at Dow Magnesium Corp. plant at Marysville, Mich., and has been cut 600,000 pounds monthly to 6,000,000 pounds at Velasco, Tex. Monthly production schedules have been cut 217,000 pounds to 833,000 at the Magnesium Reduction Co. plant at Luckey, O.; 1,100,000 pounds to 1,200,000 at the Electro Metallurgical Co. plant at Spokane, Wash.; and 2,000,000 pounds to 4,500,000 at the Basic Magnesium Inc. plant at Las Vegas, Nev.

Develops New Synthetic Rubber Insulation for Wire

Nubun, a new synthetic rubber latex insulation for power, lighting and communication cable has been developed by United States Rubber Co., New York, it was announced recently by C. W. Higbee, manager of the Wire and Cable Department.

The new insulation is a result of wartime developments in rubber technology and will permit the design of new types of wire and cable with improved electrical and physical characteristics.

Controversy Rages Over Jobless Benefits for Displaced Workers

Conservatives attack Kilgore proposal for allowing unemployment aid as high as $35 weekly for two years after war ends. George bill, approved by Senate Finance Committee, would leave compensation to the individual states

PROBLEMS that will arise from the transition from war to peace are receiving almost feverish attention of Congressmen, back from their political convention and fence-mending recess.

Among the foremost of these problems is that of cushioning the shock that cessation of munitions production and the return of millions of servicemen will have on employment. Linked to this problem is that of providing unemployment benefits for displaced war workers and veterans.

Generous Unemployment Benefits

The GI "bill of rights", already passed, provides for employment, educational and vocational benefits for veterans, along with mustering out pay. Pending measures would provide greater benefits for the servicemen and also would provide more generous unemployment benefits for displaced war workers.

One bill, the Kilgore-Murray industrial demobilization and reconversion measure, would set up an overall machinery, headed by a Director of War Mobilization and Adjustment vested with tremendous powers over other government agencies. It would greatly increase mustering out pay for servicemen, rising to as high as $1050 in some cases. It also would provide liberal benefits to civilians made idle by the closing of war plants, granting unemployment insurance benefits as high as $35 a week for as long as two years after the war.

Under bitter criticism by conservatives of both parties, the Kilgore-Murray bill has been attacked as providing permanent pensions for war workers and as establishing a new system of regimentation.

Another bill on the more conservative side is that sponsored by Sen. Walter F. George which would leave unemployment compensation to the states and would not supplement the payments with federal funds. It would, however, guarantee the solvency of the states' funds, now totaling more than $5,000,000,000. The George bill has been approved by the Senate Finance Committee.

It is over these two bills that controversy over reconversion measures is developing. Labor leaders and others demanding liberal unemployment benefits are insistent that these benefits be linked to the overall reconversion legislation. Otherwise, they fear, liberal jobless benefits probably would be sidetracked.

AWARDS . . . .

Additional war plants honored with Army-Navy-Maritime emblems for outstanding achievement in the production of war materials

Hexagon Tool & Engineering Corp., Dearborn, Mich.

Kewaunee Shipbuilding & Engineering Co., Kewaunee, Wis.

Harry Lang Co., River Falls, Wis.

H. W. Loud Machine Works, Pomona, Calif.

National Gypsum Co., Niles, O.

Rheem Mfg. Co., New Orleans, La.

Schaible Co., Cincinnati.

Steel Products Engineering Co., Springfield, O.

Tri-Clover Machine Co., Kenosha, Wis.

Vanco Machine & Engineering Co., Grosse Pointe Park, Mich.

Vandercook & Sons, Chicago.

York Corrugating Co., York, Pa.

Southern Aircraft Corp., Garland, Tex.

De Laval Steam Turbine Co., Trenton, N. J., adds fourth star.

Independent Pneumatic Tool Co., Aurora, Ill., receives fourth award.

Western Pipe & Steel Co., San Francisco, adds second gold star.

Plomb Tool Co., Los Angeles, adds second star.

Illinois Gear & Machine Co., Chicago, adds second star.

Simmons Machine Tool Corp., Albany, N. Y., adds third white star.

C. H. Schnorr & Co., Springdale. Pa.

Jessop Steel Co., Washington, Pa., awarded second white star.

Homestead Valve Mfg. Co. Inc., Coraopolis, Pa., receives third gold star for "M" pennant.

Hillerich & Bradsby Co., Louisville, Ky.

P. R. Hoffman Co., Carlisle, Pa.

Litton Engineering Laboratories, Redwood City, Calif.

Motiograph, Chicago.

Perfect Circle Co., plants at Hagerstown, New Castle, Richmond, and Tipton, Ind.

Wehr Steel Co., Milwaukee.

Worcester Stamped Metal Co., Worcester, Mass.

Atlas Ansonia Co., New Haven, Conn.

Auto Compressor Co., Wilmington, O.

Bliss & Laughlin Inc., Buffalo.

Bonschur & Holmes Co., Philadelphia.

Cooper Alloy Foundry Co., Hillside, N. J.

Dooley's Basin & Dry Dock Inc., Fort Lauderdale, Fla.

William M. Fencil Co., Huntley, Ill.

Ehaloy Foundries Inc., Rockford, Ill.

Hytron Corp., Salem, Mass.

Byrnes Directive Gives WMC Veto Power Over WPB Program

Output of civilian goods banned where such interferes with recruitment of labor needed by war industries. Violators of employment ceilings will be denied materials, fuel, power and transportation. WPB resumption plans seen given setback

WAR Manpower Commission is empowered to veto resumption of civilian production anywhere in the nation where such interferes wi.h recruitment of labor for war industries producing critical materials for the armed services in a directive just issued by James F. Byrnes, director, Office of War Mobilization.

This directive came as a result of the need for an additional 200,000 workers in war plants producing such products as heavy guns and ammunition, bombs, radar equipment, trucks, tanks, construction equipment, etc.

In some Washington circles the order is viewed as a severe jolt to the War Production Board's plans for resumption of civilian goods production since the WMC is made the final arbiter in determining civilian production.

Mr. Byrnes said that he had spent several days in conference with governmental agencies working on the program and that "all are in accord that the needs of the war must come first—ahead of any thought of increased civilian production or increased employment for producing civilian goods. We have the enemy on the ropes; he is dazed and his knees are buckling. This is no time to take a holiday and give him time to recover. It is time to finish the job. We cannot let down our men in the armed services."

This new program, which is an elaboration of the plan established for the West Coast on Sept. 15, 1943, places employment ceilings on nonessential industries in labor shortage areas and authorizes the cutting off of materials, fuel, power and transportation from nonessential industries which violate these ceilings.

"We have placed responsibility on the area officials to take all necessary steps to free from civilian and less essential industries men possessing the skills required to produce war goods. The placing of these ceilings on employment may work hardships on particular individuals," Mr. Byrnes admitted. "But we will depend upon local administration for the best possible handling of the problem. . . . The communities must meet the responsibility if we are to be able to finish the war without enacting a universal service law."

To help meet the labor shortage problem, Mr. Byrnes pointed out that programs for more efficient utilization of prisoners of war are being carefully developed by the War Department. Unskilled foreign labor is being used for a limited period where it is impossible to secure enough local labor.

The West Coast plan set up last September established area production urgency committees in each of the critically tight labor areas under the chairmanship of WPB officials. Manpower priorities committees directed by the WMC were also established to set ceilings, control referrals and fill priority needs as determined by the area production urgency committees.

Thus, under the new directive, the decision of the chairman of the manpower priorities committee in determining employment ceilings in war industries and in nonessential industries is to be considered final. Teeth have been placed into the power of the WMC in enforcing its orders by authorizing the use of sanctions lawfully available to the government and the enlistment of aid of all interested government agencies.

Obviates Interference with War Work

Charles M. Hay, deputy chairman and executive director, WMC, said that Justice Byrnes' order, while recognizing the need for getting ready for resumption of civilian production as may be possible, is designed specifically to make certain that under no circumstances do such programs interfere with manpower requirements for war production.

No civilian production will be permitted even in groups 3 and 4 labor areas without the approval of the area production urgency committees. And these committees shall not approve civilian production until the representative of the WMC within the area has certified in writing to the committee that labor is available for such production wi hout interference with local and inter-regional labor recruiting efforts.

"People want to leave their jobs in war plants in order to get back to civilian business," Mr. Byrnes commented. "If the present exodus from war plants continues, it is going to interfere seriously with the possibility of an early end of the war. . . . In general terms there will be no increase in civilian production permitted in any area where the labor required for it is needed in war production. Our war needs will come first, and civilian production must not interfere with it."

Informed circles in Washington regard the new directive as a setback for Donald Nelson, chairman, War Production Board. It is seen as virtually destroying the fourth of a series of reconversion orders by WPB scheduled to go into effect Aug. 15 giving the green light to civilian industries where they can operate without using materials, facilities or manpower needed in the war effort. Under the Byrnes directive, WMC is made the final arbiter in determining civilian production in place of WPB.

Officials of WPB asserted late last week that the Aug. 15 reconversion order will be issued on schedule and will be unchanged except for the effect of the manpower directive.

This order is the fourth and last in WPB's program to create the machinery for gradual reconversion. The first three lifted restrictions on the use of aluminum and magnesium, permitted manufacture of experimental models from any raw materials, and authorized placement of forward orders for postwar machine tools.

Attorney General Biddle also has acted to remove some of the uncertainties of reconversion by ruling that industry advisory committees may confer with WPB on reconversion plans without violating the antitrust laws, if committee members do not reach an agreement in advance. He requested that any joint action which WPB and industry decide upon for speeding reconversion be submitted for his department's approval.

Increased Commercial Truck Output Planned for 1945

Production of 56,705 commercial trucks has been programmed for the first quarter of 1945, the War Production Board has announced, compared with 10,894 in the first quarter and 41,068 for the last quarter of this year. The program for the first quarter of 1945 calls for production of 40,000 medium trucks, 13,366 light heavy trucks, and 3339 heavy trucks. Program for the first quarter of 1944 called for production of 6802 mediums, 500 light heavies, and 1865 heavy heavies, these figures being increased for the final quarter to 30,850 mediums, 13,366 light heavies and 3266 heavy heavies.

Compiles List of Government Owned Machine Tools

A card record system by which government-owned machine tools available for transfer may be located quickly has been established by the War Production Board.

Expects Heavier Demand for Screw Machine Products

Increased demand for screw machine products for use in motor vehicles may be anticipated, the industry advisory committee was told at its recent meeting by War Production Board officials. Whether this demand can be met depends upon

the labor situation, committee members said. The truck-trailer program is expected to expand steadily and automotive repair parts will be needed in ever increasing quantities.

Prices higher than those now permitted by the Office of Price Administration will be necessary when civilian production is resumed, committee members said, to enable the industry to operate profitably. Some members expressed the opinion that costs will be from 40 to 50 per cent higher than costs of the base period upon which present prices are figured.

Urgent Need for Domestic Type Coal Stokers Revealed

Domestic type coal stokers for residential use are urgently needed for civilians, William Y. Elliott, vice chairman for civilian requirements, War Production Board, told the industry advisory committee at its recent meeting. Committeemen said that because of the difficulty in getting sheet steel, castings, and fractional horsepower motors and because about 90 days are required to complete production after material is put into process, no substantial production of domestic stokers can be possible before the first quarter of 1945.

Additional Aluminum May Be Freed for Civilian Goods

War Production Board is studying feasibility of making aluminum available, in addition to the limited amount permitted for certain articles and the substitution of aluminum for other metals under provisions of order M-1-i, to manufacturers who might be able to make cooking utensils and household articles without interfering with war production. Such manufacture, representatives of the industry have told the War Production Board, could be fitted into plant schedules during "down times" in war work.

Third and Fourth Quarter Rail Allotments Cut

Tonnage of new replacement rails available for domestic railroads during the third and fourth quarters of 1944 will be cut substantially, owing to reduced production and increased demands of other agencies of the government, Office of Defense Transportation has been advised by the War Production Board.

During the third quarter, approximately 400,000 tons of rails will be allotted to the railroads under the new decision, compared with 500,000 tons previously allotted and an original request for 550,000 tons. The fourth quarter allotment likely will be somewhat less than that for the third quarter. Total new rail for the full year is now indicated at about 1,800,000 tons, which compares with 1,540,000 tons made available in 1943.

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

PUBLIC UTILITIES: Simplified construction procedures for telephone and telegraph companies as well as electric, water, gas and central steam heat producers, have been made applicable retroactively to construction authorizations issued prior to June 10. Affected utilities are authorized to: (1) Use the abbreviated allotment number U-2 instead of specific quarterly allotments previously issued, except for allotments in excess of 100 tons of steel or 10,000 pounds (25,000 pounds in the case of telephone and telegraph companies) of copper wire and cable. Electric, water, gas and steam heat producers may use the U-2 symbol to obtain only 5000 pounds of aluminum wire and cable for individual jobs. Specific allotments for these three materials in excess of the quantities indicated remain in force. (2) Use and purchase of larger quantities of materials and equipment than were authorized on approved applications, if these are of same kind, type, size and capacity as were approved, and if they are required for the job. In the case of electric, water, gas or central steam heat producers, however, this does not apply to transformers, poles, crossarms and meters, the use and purchase of which are limited to quantities specifically authorized on the previously approved application.

Utilities must accompany any purchase order for 5 kilovolt-ampere and smaller transformers with form WPB-3782, approved by the regional utility engineer in his region, or by the chief of the Inventory Control Branch, Office of War Utilities, Washington.

ENGINES: Purchasers of internal combustion engines now must submit full data as to their contemplated use. Purchasers of any product listed in order M-293, table 4, now must furnish immediately to the manufacturers information as to the specific use to be made of the component; the program or project for which the engine or component is required; the government contract number identifying the prime contract placed by the claimant agency for such program or project; and the name of the claimant agency sponsoring the program or project.

INDEX OF ORDER REVISIONS

Subject	Designations
Building Materials	M-9-c-4
Lighting Equipment	L-327
Motors, Electric	L-341
Saws	L-326
Screening, Insect	M-9-c
Tanks, Water	L-79
Price Regulations	
Brass Mill Products	No. 12

L ORDERS

WATER TANKS: Restrictions on sale of hot water storage tanks and expansion tanks have been removed. Low-pressure steel boilers, designed to burn gas or oil only as a fuel do not require ratings from consumers. Sale of equipment using gas as a fuel is prohibited unless the prospective purchaser has obtained a letter from the utility company which will deliver the gas, stating that the gas can be delivered. In applying for preference ratings, if the equipment is to be used for residential purposes, form WPB-2896 should be filed with the nearest Federal Housing Administration field office; if it is to be used for commercial or industrial purposes and is construction of a type which is restricted under order L-41, form WPB-617 should be filed with the nearest WPB field office and if not so restricted, form WPB-1319 should be filed. Applications for equipment to be used for farm purposes should be filed on form WPB-617 with the County Agricultural Conservation Committee if the construction is restricted under L-41; if not so restricted, form WPB-1319 should be filed with the nearest WPB field office.

The AA-3 rating assigned to sellers to enable them to purchase and maintain an inventory of equipment may no longer be used to obtain repair parts for stoves rationed by OPA. (L-79)

SAWS: Manufacture of about 50 additional types of solid tooth circular saws is now permitted and specification changes in permitted types of wide and narrow band saws have been made. (L-326)

LIGHTING EQUIPMENT: Additional types of aircraft lighting equipment and more manufacturers are listed now in table of accepted assemblies of order L-327. A number of items formerly certified exclusively by the Army Air Forces are now also certified by the Navy Bureau of Aeronautics for use in naval aircraft. (L-327)

ELECTRIC MOTORS: Users of commercial type electric motors now are required in a quarterly report to WPB to state their past usage and what motors they require for future production. Persons using more than 450 fractional horsepower motors or 75 single phase integral horsepower motors per quarter are not now permitted to accept delivery of motors, if they have not filed reports on their requirements. Distributors who receive motors allotted by WPB on form WPB-547 must distribute them to replacement uses and to farmers as provided for in priorities regulation No. 19. (L-341)

M ORDERS

INSECT SCREENING: Release for civilian use of 669,947 square feet of insect screening which is under control of the Metals Reserve Co. and undetermined quantities of copper screening which have been frozen in the hands of miscellaneous holders has been announced. No person is permitted to deliver more than 50 square feet to other than (1) jobbers, wholesalers and retailers or (2) government agencies. Restrictions have been removed on cutting and installing new and uncut rolls of copper insect screening. (M-9-c)

BUILDING MATERIALS: Frozen stocks of copper and copper-alloy fittings and other fabricated building materials have been released. Weatherstripping and 40 other items held by manufacturers, jobbers and retailers have been released and may be used without restrictions. However, the delivery and installation of copper and copper-base alloy, sheet, plate, roll, strip, rod, bar, extruded shapes and wire, as building materials, continue to be restricted. Use of copper or copper-base alloy pipe or tubing in connecting new water heaters which replace heaters that are worn out or damaged beyond repair is permitted if copper or copper-base alloy pipe or tubing was used in installing the heater being replaced. (M-9-c-4)

PRICE REGULATIONS

BRASS MILL PRODUCTS: Maximum prices for unused brass mill products sold for remelting, which had been established only for sales by certain government agencies, have been made applicable to all sellers. (No. 12)

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

ARMY E NAVY

MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company

MOLY

500 Fifth Avenue · New York City

By A. H. ALLEN Detroit Editor, STEEL

MIRRORS of MOTORDOM

Fisher brothers will continue in automotive business in big way, but definite plans are not revealed. . . Low-priced auto shares in stock exchange boom reflect easy money and expectations for lush postwar market

DETROIT

DESPITE the gagsters' allegations, the following advertisement did *not* appear in recent classified sections of Detroit newspapers:

WANTED—Light office work, by four brothers, with 25 years' automotive experience.

As one junior Fisher Body executive quipped: "This may refer to the four Fisher brothers, recently resigned from the ranks of General Motors, but I don't know whether they have obtained their releases yet."

All joking aside, the departure of the veteran Fisher body executives startled the motor world and immediately touched off new speculations about the postwar automotive picture, the like of which Detroit has not seen in a long time. Brokers were generally making hay out of the situation, and on several days last week, half the shares traded on the New York exchange were the low-price motors—Graham-Paige, Packard, Hupp, Hayes, Murray and half a dozen others. It is extremely doubtful if this wave of speculative trading is based on any factual developments, though there are those who maintain otherwise.

At a press conference following their resignation from General Motors, the Fisher brothers, Lawrence P., William A., Alfred J. and Edward F., spoke in restrained fashion about any future plans they may have. They left the inference they would continue in the "automotive business," that whatever they did do would be "something big," that they would not likely resume production of merely automobile bodies, since of course the name and trademark "Body by Fisher" rests with General Motors which bought out the Fisher interests a quarter of a century ago for something over 200 millions. It was considered more likely the Fishers might sponsor an entirely new car, perhaps knitting together a dozen or so producers of components such as engines, transmissions, electrical equipment, etc., under their banner.

Easy money conditions of the current wartime economy were reflected in the gyrations of Graham-Paige stock which rose from $2 to $7 a share in the space of about a week, on the strength of news that Joseph W. Frazer was moving into the company as chairman of the board, with financial backing of Floyd Odlum's Atlas Corp. and with plans for new cars, trucks and agricultural implements in the postwar era. Frazer, originally associated with Chrysler Sales Corp., later became president of Willys-Overland at Toledo, then left after disagreement with Ward Canaday, chairman, and took over the Warren City Mfg. Co., Warren, O., which is now busy on Navy landing craft contracts. Supposedly the plans are for the Warren plant eventually to build farm machinery to be sold under the Graham-Paige name, while the Detroit plant will build automobiles, said to be already designed. The catch here is that what is left of the Graham plants in Detroit is little more than a fair-size warehouse, filled with DPC machinery which is turning out aircraft engine components and amphibious tractors. Millions of dollars would have to be spent before anything resembling an automobile could be manufactured, but cash-laden investors, recognizing the coming automotive boom, are buying up stocks of any company that even smells automotive.

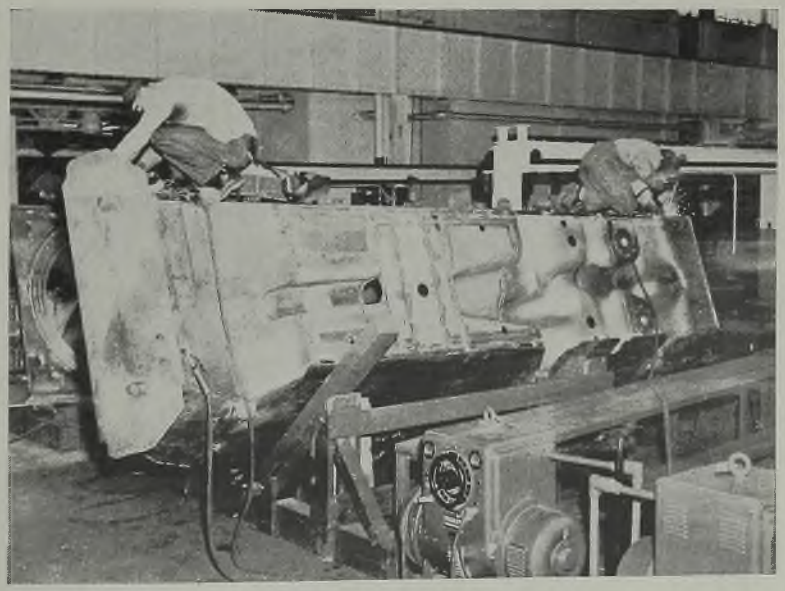
Assets Are Inconsequential

Nothing proves this point any better than the case of Hupmobile, a company which is virtually destitute of everything but an old manufacturing building and a name long since in eclipse; yet Hupp stock last week was pushed up to around $6 a share and trading was in excess of 100,000 shares daily.

Never in Detroit's recent history has there been so much discussion and argument over the supposedly imminent organization of another "automotive combine" to take a crack at the lush market prospects which await General Motors, Ford and Chrysler when car production is resumed. However, seasoned observers here discount such talk nearly 100 per cent and until something more concrete develops than is now apparent the only sound appraisal of the situation is that the present flurry is purely and simply speculative—and possibly not so pure or simple at that.

George T. Christopher, president of Packard, talked postwar prospects straight from the shoulder at a dinner honoring a group of war workers from his plants the other evening. He acknowledged Packard has about the most difficult reconversion job of any motor plant, but added that he soon would have about 1,000,000 square feet of floor space available for new car production, which will be initially at a rate of 6000 a month, or almost exactly the rate of Packard production in 1941 and confirming the allocation breakdown listed in these pages recently. However, Christopher said it was the hope to eliminate the quota system of production three months after the resumption of production, whereupon Packard would boost output to around 10,000 a month. The latter rate would be close to Packard's best year—1937—but plans for the second model year of postwar production are being aimed at annual output of 200,000.

Initial production of Packard cars will have bodies built by Briggs, which previously supplied bodies for the Packard Clipper line. When Packard's press department can again be returned to operation, it may be possible to handle all body production within the plant. The



WELDED SCOUT CAR: Arc welded hull of the Army's M-8 armored scout car serves as a frame and makes possible a lower vehicle. The M-8, hitherto a military secret, has been in production for many months at Ford Motor Co. plants at Chicago and St. Paul. Photo courtesy of Hobart Bros. Co., Troy, O.

company plans to continue in the aircraft and marine engine business in a limited way, and hopes to keep about 6000 employed in this work. Present employment is around 39,000, and this probably will ease off to about 28,000 after the war, still more than double the peacetime peak of 12,000. The postwar decline in employment will be realized in part from women and older men returning to their homes, and in part by suspension of new hiring for several months, permitting the normal daily turnover to trim the force still further.

Floor space for spare parts production and eventual new car output is being pieced together in several ways by Packard. Additional subcontracting of present work is releasing 250,000 square feet; service department has been moved to Cleveland and Detroit garages; a Detroit plant has been purchased to provide 120,000 square feet; and negotiations are now in process for lease of a DPC-owned aircraft plant with 500,000 square feet.

Christopher put the cards on the table for his working force when he told them that $125 will have to be taken out of the price of the postwar Packard to offset higher labor and material costs. He urged stewards and supervisors to lend their help toward devising means for trimming 15 man-hours of work from each postwar car.

G. H. Pratt, general sales manager of Hudson, told dealers and distributors at a recent conclave here that the forthcoming Hudson models will be basically the 1942 models with revised styling to give a new model appearance. This would include such features as new moldings, grilles, interior trim, ornaments and other nonfunctional parts. A. E. Barit, president, assured the meeting the plant will have plenty of space to reconvert when the signal is given, and all dies and tools are available to resume car production.

An extended statement covering the reconversion of automotive plants has been filed with the Senate war contracts subcommittee by the Automotive Council for War Production at the request of Senator Murray, chairman of the committee. The remarks include recommendations on such matters as plant clearance, property removal and other immediate phases of war property disposal, the emphasis being particularly upon speeding up disposal procedures.

Regulations Hamper Preparations

A typical example is cited of the conflict between current regulations and any attempt to make practical preparations for reconversion—the fact that privately-owned machine tools are frozen to war jobs, even though surpluses of government-owned tools are available. The freezing of such contractor-owned tools makes it impossible for industry to do any realistic advance scheduling of the use of these machines, or to begin now to recondition them or retool them for automotive production.

One automotive company selected a standard machine, owned by the company but being used on loan on a government contract, as the subject of a test case. The machine is typical of those which are in surplus stocks of various procurement agencies due to cutbacks and cancellations. The company requested approval of a plan to substitute a government-owned machine, but was refused such approval by the military service involved on the basis that such substitution would "essentially be making a machine available for civilian production" and thus would conflict with the idea that government-owned machines are available only for war work.

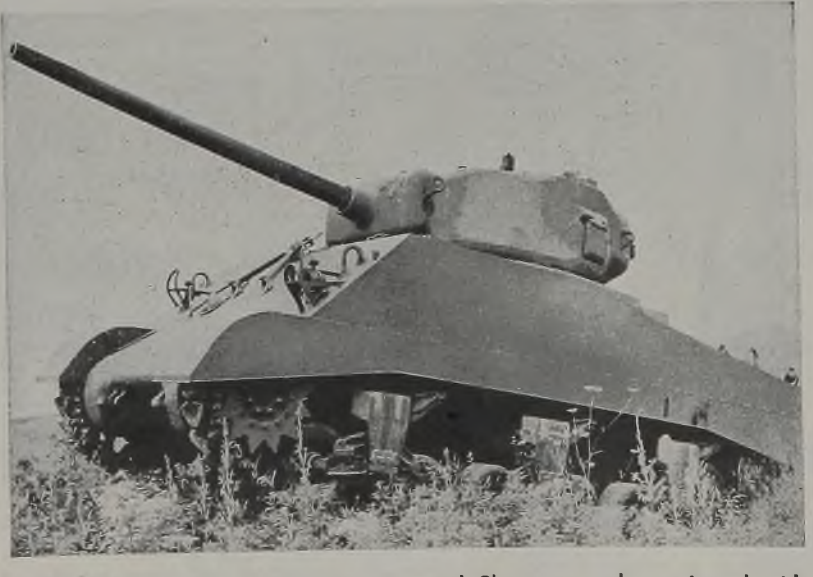
A related example is that some offers to buy specific items of surplus equipment under the price policy laid down by the Surplus War Property Administrator have been refused by the military services on the grounds that they must still adhere to an older price formula, in which lower rates of depreciation were allowed.

On the matter of plant clearance, it is possible to visualize but not to gage precisely the size of the physical task facing each of the various automotive companies. One, for instance, will have to move 100 acres of equipment, including large presses, out of its plants to make room for reconversion to automotive production. Another company faces the job of unscrambling 2,750,000 square feet of floor filled with a mixture of government-owned and company-owned machinery.

There are those who maintain the automotive industry's loud protestations to Congress and to government agencies about the need for speeding up procedures for terminating contracts and clearing plants is partially a matter of throwing up a little dust storm to cover the industry's own negligence (or perhaps lack of time) in compiling full inventories of materials on hand and parts in process. But this is a common difficulty of all war plants, even more pronounced in the aircraft industry, and it is difficult to blame plants for inventory shortcomings when they have been under the full pressure of production demands.

R. H. McCarroll, who for a number of years has headed up metallurgical activity and development work at Ford Motor Co., now is understood to have been named director of all engineering for Ford, although no confirmation of the change has been made by the company.

Nash-Kelvinator gray iron foundry in Kenosha, converted some time ago to production of aluminum cylinder heads for Pratt & Whitney aircraft engines, is in process of discontinuing this work and will resume gray iron production in a limited way, presumably for reinforcing the supply of automotive castings.



NEW TANK: A new model M-4 General Sherman tank, equipped with diesel engine, and wet ammunition stowage, has been produced by the Fisher Body division of General Motors Corp. at its Flint and Grand Blanc, Mich., plants

Buick Plans Sharp Increase In Postwar Auto Production

Buick division of the General Motors Corp., Detroit, which will probably receive $50,000,000 of $500,000,000 which GM plans to spend for postwar rehabilitation of its plants, expects to equal or better in three years the 1,450,000 cars built in the six years prior to the war.

Buick's best year was in 1941 when the production rate reached 375,000 units, compared to only 43,000 units in 1938. Passenger automobiles will be the company's only objective in the postwar era. At present Buick is producing engines for bombers, multi-ton transmissions and final drive units for tanks, cartridge cases, a variety of forgings, and other products

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WING TIPS

Airport construction proceeds in Latin America despite obstacles resulting from war. Twenty-one hundred civil fields expected to be in operation by close of 1944, affording important link in postwar hemisphere trade

SCORES of airports and landing fields have been constructed in the Americas in recent months, despite many wartime obstacles. There is little doubt, moreover, that the airport construction program that we see going on in the United States and the 20 other American republics will be continued as a result of the demands of postwar expansion of commercial aviation, according to Norris M. Mumper, director of aviation, Office of Inter-American Affairs.

It is a truism that expansion of aviation and airport facilities proceed together, says Mr. Mumper. This has been demonstrated in the rapid development of commercial aviation in the Western Hemisphere since the outbreak of war. With the expansion of commercial aviation in the postwar period, which some estimates place as high as at least three times the present service, many new airports will be needed.

Airport construction trends in the United States not only show the sizable increase in airport facilities that has taken place here since the outbreak of war but also give reason for believing that existing United States airport facilities may possibly be doubled in the postwar period.

In the United States, with the completion of more than 550 airport development projects undertaken by the Civil Aeronautics Administration at a cost of $400,000,000, there will be, at the close of 1944, more than 3000 civil airports, of which 940 will be class III or better—that is, suitable for scheduled air carrier transport.

But because of the anticipated post war expansion of aviation in the United States, the Civil Aeronautics Administration has recommended that the United States' goal of 4000 airports, which was originally projected in 1939, now be raised to a postwar goal of 6000 airports, within five years after hostilities cease. This proposed postwar program will cost approximately $800,000,000. Such an expenditure would mean doubling the present airport investment in this country.

Airport Facilities Expanded

Latin America has similarly undergone rapid airport expansion since the war began. In the 20 other American republics, at the close of 1944, there probably will be more than 2100 civil airports, of which between 300 to 400 will be class III or better. Because expansion of airport facilities must go hand in hand with expansion of commercial aviation, the other Americas will obviously experience airport expansion of record-breaking proportions in the postwar period.

News reports of aviation and airport developments "south of the border" illustrate how present and future airport trends in the United States are duplicated in the other Americas. In Peru, for instance, President Manuel Prado, to prepare for the postwar aviation expansion anticipated in his country, recently decreed the formation of the Peruvian Airport & Commercial Aviation Corp. (CORPAC), a corporation owned entirely by the Peruvian government, which will have an initial capital of $1,538,000. The charter gives this new agency wide powers to organize and manage airports. Projected improvements for the airport at Lima will cost $183,000.

In the neighboring Republic of Chile, President Juan Antonio Rios is reported by the Chilean radio to have signed appropriations of $646,000, to be used, in part, for the construction of a network of air fields throughout the nation. In Brazil, Air Minister Joaquin Pedro Salgado Jr., is reported to have told the press that several large airfields, capable of accommodating large cargo planes, and also a pilot training school would be built in the State of Rio Grande do Sul.

In Nicaragua airline facilities were increased substantially during 1943 with the completion of the modern Las Mercedes Airport, the second airport near Managua, and the inauguration of two new lines—one, a common carrier, to New Orleans, La., from Balboa, via Guatemala City and Merida, and the other, a charter service to Miami, Fla., from San Jose, Costa Rica, via Tegucigalpa and San Salvador.

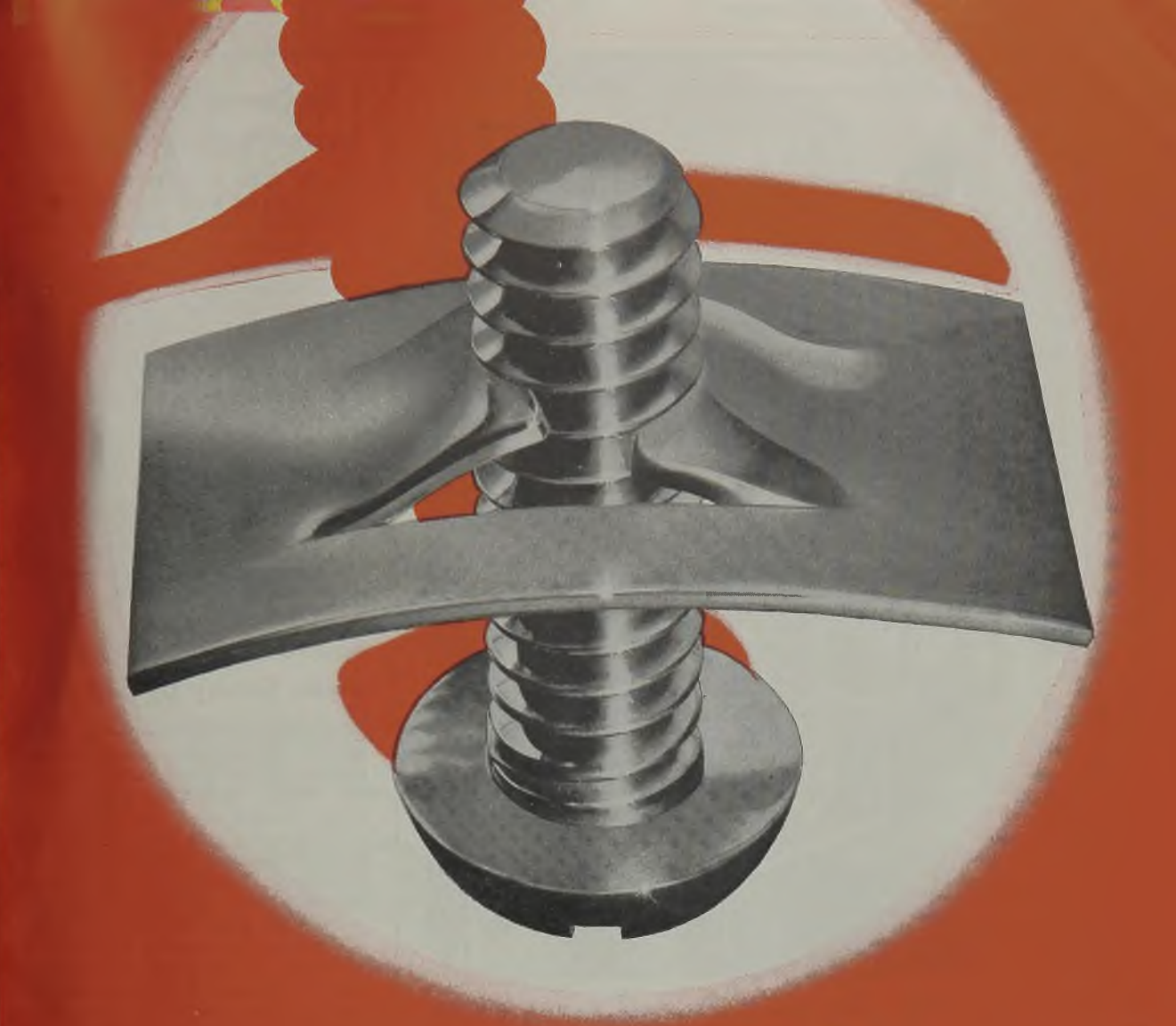
Build Airports in Remote Jungles

In recent years, especially during 1943, airports have been built in the remote jungles of eastern Nicaragua, making possible the shipment of machinery to the gold mines and the transportation of men, supplies and foodstuffs to the rubber-tapping areas. These airports made possible the necessary quick shipment of highly perishable Hevea rubber seedlings and budwood of high-yielding clones, cinchona seedlings, derris cuttings, and other strategic plant stock to isolated areas. Without aid of airways, establishment of these complementary agricultural crops in eastern Nicaragua would have been impossible, the Department of Commerce reports.

In Paraguay, Panair do Brazil's new airfield at Campo Grando, near Asuncion, the capital, was opened in April. In Ecuador the airport-extension project at Guayaquil has been completed. Ecuador plans to construct a network of airfields near its principal cities that will in the future facilitate national air transportation.

Mexico, which has a splendid modern airport at Monterrey, will have two new ones soon—at Nuevo Laredo, across the border from Laredo, Tex., and at Mexi-

KINGCOBRA LINE: The P-63 Kingcobra, a fast new fighter, is replacing its predecessor, the P-39 Airacobra. Both planes, manufactured by Bell Aircraft Corp. at Buffalo, are shown above on the assembly lines. P-39s are shown on the first two lines while the Kingcobras pack the next three



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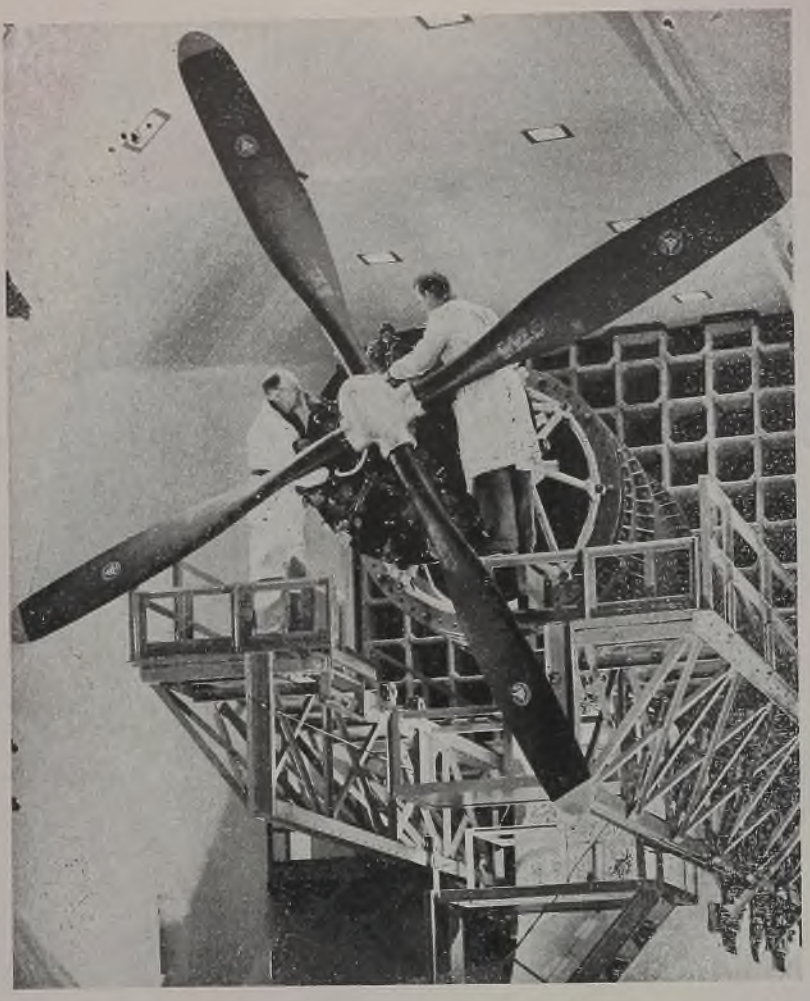


ABSORBS 3000 HORSEPOWER: Claimed to be the largest 4-blade hollow steel propeller in quantity production in this country, this 16-foot, 8-inch propeller being produced by Curtiss-Wright Corp., is designed to absorb 3000 horsepower. Above it is shown in a test cell at the company's Caldwell, N. J., plant

co City. The airport at Mexico City, an expansion of the present Aeropuerto Central, will boast five main runways ranging in length from 5740 feet to 8200 feet, and several smaller runways. The area of the field will be almost twice as large as that of New York's famed LaGuardia Field. Its passenger terminal will be capable of accommodating 1800 persons at one time.

Postwar Prospects Bright

Many foreign traders believe postwar prospects are bright for maintaining U. S. exports to and imports from the other Americas. They point out, for one thing, that Latin America is building up substantial reserves of purchasing power for postwar use as a result of a heavy surplus of exports. According to the National City Bank of New York, the other American republics, as a whole, have accumulated gold and foreign exchange, mostly U. S. dollars amounting to approximately $3,000,000,000. The bulk of this backlog of buying power has accumulated during the war period when United States imports from Latin America have risen to the highest level since 1920 in dollar value.

"The war has brought about the realization by the American peoples that the economics of the United States and most of the other American republics largely are complementary," says Mr. Mumper. "We now know that inter-American co-operation, based on the concept of mutual aid for mutual benefit, has a solid economic base. The $1,300,000,000 worth of imports the United States received from Latin America last year emphasized that.

"The war also has stimulated the interest of the American peoples in each other. The number of United States citizens studying Spanish today is unprecedented. Similarly, the study of English in Latin America has reached new heights. Travel authorities believe this war-stimulated interest will be reflected in tourist travel after the war ends."

B-29 Carries Ton of Aircraft Radio Equipment

Each B-29 Superfortress taking off on a bombing flight over Japan carries approximately 2000 pounds of aircraft radio equipment.

Composed of many different radio sets and devices, all of which were either developed or improved in the Signal Corps' Aircraft Radio Laboratory at Wright Field, the radio complement for this super-bomber was the largest single installation job ever undertaken by the laboratory.

These radio sets range in weight from one-half pound, for the smallest, to 550 pounds.

None of the radio equipment in the B-29 was designed specifically for it as most of the sets have been used for some time, in various combinations, in both fighter and bomber aircraft.

Postwar Transportation Under Survey by SAE

Comprehensive engineering discussion of wartime and postwar technical problems of land and air transportation will feature the SAE national West Coast transportation and maintenance meeting to be held Aug. 24 and 25 in Hotel Multnomah, Portland, Oreg.

Tentative program for the meeting, one in a series of wartime engineering conferences being held by the Society of Automotive Engineers for dissemination and discussion of war-developed technical data, will be concerned with wartime maintenance of motor trucks, buses, and air cargo planes, and with fuels and lubricants used in commercial transport vehicles. The tentative program brings the postwar into focus with technical papers on future design of engines, and studies of land and airborne transportation of passengers.

Technical papers tentatively scheduled include:

"Possibilities of Gasoline Engine Development," by F. S. Baster, engineering vice president, White Motor Co., Cleveland.

"A Solution of Present-Day Fuel Problems,"by W. H. Paul, professor of automotive engineering, Oregon State College, Corvallis, Oreg.

"Relation of Lubrication and Filtration to Engine Life," by C. N. Bentley, of DeLuxe Products Corp., LaPorte, Ind.

"Air Cargo; A Problem Between Carriers on the Ground and in Flight," by R. D. Kelly, United Air Lines Transport Corp., Chicago.

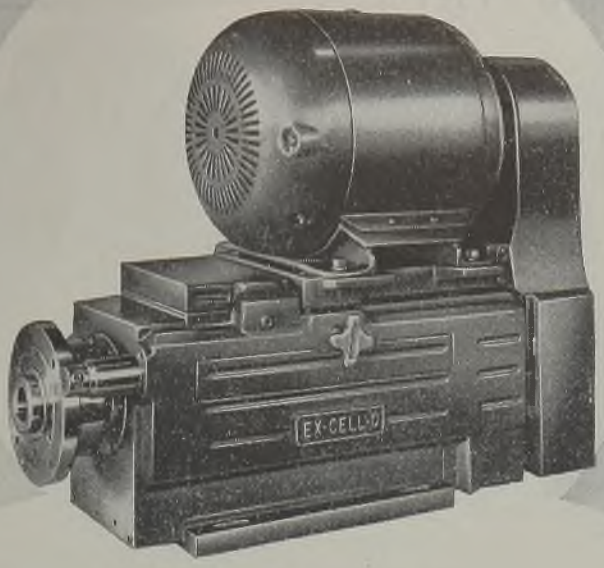
"Postwar Expectations and Possibilities of Air-Borne (Helicopter) Bus Service," by Agnew E. Larson, of Rota-Wings Inc.

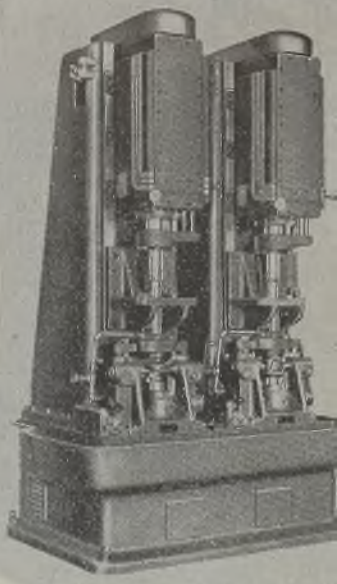
"Surface Buses of the Future," by W. W. Churchill, superintendent of operation and maintenance, Washington Motor Coach Co., Seattle.

(XLO)

EX-CELL-O *for* PRECISION

Here is shown an instance where the Ex-Cell-O Small Hydraulic Unit (Style 21) is used on a machine for the accurate drilling of holes in oil pump bodies.





On this Ex-Cell-O double drill press, two Style 25-A Ex-Cell-O Hydraulic Units are mounted on the columns in vertical position. This has definite advantages on certain classes of work.

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Ex-Cell-O Hydraulic Power Units are standard and produced in quantities, but in nearly every case where the unit is used it becomes a part of a special, high production type machine for a specific operation. These units are economical because, as applications change, the units can become a part of the new machine even though entire base is redesigned.

The units can be mounted on any plane—horizontally, vertically, or angularly—on a temporary or a permanent base, and they can be arranged so that it is possible to use them in connection with guide bars and multiple drill heads.

Find out today how Ex-Cell-O Special Machines and Ex-Cell-O Hydraulic Power Units can fit your program for today's and tomorrow's production.

Where high production, accuracy, and economy through multiple operations are required—consult EX-CELL-O now

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MEN of INDUSTRY

WILLIAM A. ANDERSON

G. F. GOLBY

ARTHUR G. GREEN

William A. Anderson has been appointed assistant to general superintendent in Carnegie-Illinois Steel Corp.'s Youngstown, O., district. Previously, he was Pittsburgh district industrial engineer for Carnegie-Illinois.

—o—

John E. Daniells has been appointed assistant manager of sales and **Fred R. Burns** has been named manager of the Sheet and Strip Steel division, Central Steel & Wire Co., Chicago.

—o—

M. E. Capouch has been named successor to **O. T. Allen,** who is retiring as assistant manager of construction materials sales, American Steel & Wire Co., Chicago.

—o—

Byne B. Waters has been appointed secretary of manufacturing for International Business Machines Corp., New York, and **Harold Christensen** has been named general secretary to the president.

—o—

R. L. Willis has been appointed a sales engineer of the Tocco Process Induction Heating division, Ohio Crankshaft Co., Cleveland, with headquarters in Milwaukee. Formerly he was assistant manager of sales, Structural and Bar division, Weirton Steel Co., Weirton, W. Va.

—o—

Bituminous Coal Research Inc. has announced the appointment of **Elmer R. Kaiser** as assistant director of research for the bituminous coal industry's expanded technical program. Mr. Kaiser will be located in the new Pittsburgh office of the organization, 719 Oliver building, Pittsburgh 22.

—o—

Frank D. Cooke has been appointed western sales manager, Pole Line Hardware division, Oliver Iron & Steel Corp., Pittsburgh, with headquarters in Chicago.

—o—

Thomas P. Archer has been appointed general manager, Fisher Body division, General Motors Corp., Detroit. Mr. Archer, who will succeed **E. F. Fisher,** has been vice president in charge of the manufacturing staff and was formerly assistant general manager of the Fisher Body division. **W. F. Armstrong,** who has been Mr. Archer's assistant, will succeed him in charge of the manufacturing staff.

—o—

G. F. Golby has been appointed manager of the Toronto branch office and warehouse of Jessop Steel Co., Washington, Pa., and **W. J. Henderson** has been named manager of Jessop's Montreal warehouse. Mr. Golby served Jessop Steel from 1925 until 1929, then for 14 years was associated with Crucible Steel Co. of America, New York, as service engineer.

—o—

Leonard C. Mallett has been made general manager, Pratt & Whitney Aircraft Corp. of Missouri, succeeding **Frederick G. Dawson,** who resigned to join Sikorsky Aircraft Corp., Bridgeport, Conn. Mr. Mallett has been vice president and assistant general manager of the Missouri organization since August, 1942. **Ronald T. Riley,** Canadian Pratt & Whitney Co. Ltd., becomes vice president, director and assistant general manager of the Missouri corporation.

—o—

Fordyce Coburn has been appointed vice president in charge of operations, E. & G. Brooke Iron Co., Birdsboro, Pa. Mr. Coburn had been assistant superintendent of the Coke division, Wisconsin Steel Co., South Chicago, Ill.

—o—

Frank Lau, formerly supervisor of the factory accounting division, Willys-Overland Motors Inc., Toledo, O., has been named director of industrial relations.

—o—

Robert B. Dickson, president of Kewanee Boiler Corp., Kewanee, Ill., has been elected a director and member of the executive and finance committees, American Radiator & Standard Sanitary Corp., New York, to fill the unexpired term of the late Martin J. Beirn.

—o—

Stanley C. Frost continues as president of Kalamazoo Plating Works Inc., which has been acquired as a wholly owned subsidiary by Precision Castings Co. Inc., Cleveland. **C. M. Hyde,** formerly with Stant Mfg. Co., Connersville, Ind., has been appointed vice president and general manager of the subsidiary and **W. C. Berry** has also joined the organization.

—o—

Arthur G. Green, associated with Norton Co., Worcester, Mass., for the past 28 years, recently having served as manager of engineering and service, has joined Bay State Abrasive Products Co., Westboro, Mass., as sales manager.

—o—

E. M. Dunlap has been appointed manager of distributor sales, Manning, Maxwell & Moore Inc., Bridgeport, Conn., and **Rudolf Beck** has been named chief engineer of the company's American Instrument division.

—o—

Earl McGee has been appointed works manager, Renown Stove Co., Owosso, Mich. For the past 30 years he had been associated with Standard Gas Equipment Co., Baltimore.

—o—

James L. McClure, engineer and public relations representative for Allis-Chalmers Mfg. Co., Milwaukee, has been appointed dealer supervisor for all Allis-Chalmers Pacific Coast offices.

—o—

Eleventh Naval District has announced promotion of **George F. Nicholson,** formerly chief harbor inspector for Los Angeles Harbor, to officer in charge of construction facilities in several San Francisco Bay area projects and Navy consultant for harbor developments on West Coast ports.

—o—

S. W. Fletcher, for many years executive vice president, J. O. Ross Engineering Corp., New York, has been elected president. Other officials are: Vice presidents, **A. E. Montgomery, H. G. Rappolt** and **F. W. Partsch;** treasurer, **J. A. Ronder;** secretary, **R. W. Grott.**

—o—

J. Howard Hamilton, assistant manager of sales, Pacific division, American Can Co., New York, recently was presented with the War Department's exceptional service award by **Maj. Gen. Edmund B. Gregory,** the Quartermaster

JOHN S. BLACK JR.

HUNTER MICHAELS

HUGH CORROUGH

GLENN C. GILLESPIE

General. Mr. Hamilton had served the government three years, first with WPB, later as consultant to the Secretary of War, assigned to the Office of the Quartermaster General. This was the first award of its kind to be made by that office.

—o—

John S. **Black Jr.**, who in 1943 joined the Stanley Works, New Britain, Conn., as counsel, has been elected secretary of the company.

—o—

S. **Wallace Diffenderfer** has been appointed assistant manager of the commercial research division of the general sales department, Carnegie-Illinois Steel Corp., Pittsburgh.

—o—

C. W. **La Pierre** has been named assistant engineer of the general engineering laboratory, General Electric Co., Schenectady, N. Y.

—o—

Charles L. Saunders, former vice president of Minneapolis-Honeywell Regulator Co., Minneapolis, has resigned as branch chief of the WPB office of Civilian Requirements, to become vice president of Wheelco Instruments Co., Chicago.

—o—

Wayne Martin, formerly assistant materials engineer with Sperry Gyroscope Co. Inc., Brooklyn, N. Y., has been appointed sales engineer for National Smelting Co., Cleveland.

—o—

Pierre S. du Pont, at one time president and also former chairman, General Motors Corp., Detroit, has resigned from the board of directors. **Angus B. Echols,** chairman of the E. I. du Pont de Nemours & Co. finance committee, was elected to succeed Mr. Du Pont.

—o—

Walter R. Ellis, formerly chief sales engineer for Logansport Machine Co. Inc., Logansport, Ind., has become associated with Compressed Air Products, Newark, N. J., sales representatives in the Newark territory for the Logansport company's products.

—o—

William H. Price Jr. has been appointed mid-western regional director for Mitchell-Bradford Chemical Co., Bridgeport, Conn. His temporary headquarters are at 432 Roslyn place, Chicago 14.

—o—

Hunter Michaels, sales manager, Railway Steel Spring division, American Locomotive Co., New York, and **Hugh Corrough,** division manager of Alco Products, have been named directors of their respective divisions of the company.

—o—

Benton J. Sauppee has been appointed district sales manager in St. Louis for American Machine & Metals Inc., East Moline, Ill.

—o—

Donald D. Couch, formerly assistant general manager of sales, American Radiator & Standard Sanitary Corp., New York, has been elected vice president-general manager of sales, succeeding the late Martin J. Beirn.

—o—

G. A. Page has been named secretary, Rhode Island branch, National Metal Trades Association, Providence, R. I., succeeding **Thomas A. Barry,** who is retiring after 30 years of service.

—o—

Dr. William Blum, chief, Section of Electrochemistry, United States Bureau of Standards, has been chosen recipient of the eighth Edward Goodrich Acheson Medal and thousand dollar prize offered by the Electrochemical Society. Formal presentation will be made Oct. 13 at the society's fall convention in Buffalo.

—o—

T. J. James has joined Eutectic Welding Alloys Co., New York, as field engineer.

—o—

Frank E. Bodine has been appointed manager of Westinghouse Electric & Mfg. Co.'s San Francisco office. He formerly represented the company in Utah and Idaho where he will be succeeded by **Stanley M. Johns** as manager of the Salt Lake City office.

—o—

Col. Bradley Dewey has been selected to receive the Chemical Industry Medal for 1944. The award, made annually by the American section of the Society of Chemical Industry, is being made to Colonel Dewey for his work in colloid chemistry, especially as pertaining to rubber latex, and for his accomplishment in administering the synthetic rubber program during the critical war period.

—o—

Glenn C. Gillespie of Pontiac, Mich., has been elected a director of National Tool Co., Cleveland, to succeed the late Arthur J. Brandt. He has been an active officer of the consulting engineering firm of A. J. Brandt Co., Detroit, for a number of years, acquiring a familiarity with the affairs of National Tool, of which Mr. Brandt was president. For 15 years Judge Gillespie served on the bench of the Sixth Judicial Circuit of Michigan.

—o—

Dow Chemical Co., Midland, Mich., announces the following appointments in its Plastics division: At Midland, **C. F. Cummins** will be in charge of plastic engineering activities in molding powders; **R. J. Minbiole** will handle packaging materials; **P. W. Simmons** is in

L. T. WILLISON

Who becomes manager of cold finished steel sales, Jones & Laughlin Steel Corp., Pittsburgh, in addition to his duties as manager of ordnance sales, as reported in STEEL, Aug. 7, p. 81.

LLOYD W. HOPKINS

Who has been named sales manager, Reading Steel Casting division, American Chain & Cable Co. Inc., Bridgeport, Conn., as announced in STEEL, Aug. 7, p. 80.

F. M. BEAUDOIN

Who has been appointed manager of industrial relations, Petroleum Iron Works division, United States Steel Products Co., Sharon, Pa., noted in STEEL, Aug. 7, p. 81.

E. E. LeVAN

Who has been elected president of Haynes Stellite Co., a unit of Union Carbide & Carbon Corp., New York, as mentioned in STEEL, Aug. 7, p. 81.

charge of protective coating materials, and **F. J. Gunn** assumes handling of plastic raw materials. In the New York office, **F. L. Brown** will be in charge of plastic engineering activities for the eastern territory, and **Gage Olcott** assumes plastic engineering duties. **E. R. Haines** will be in charge of plastics engineering activities in Cleveland, **J. E. Russell** will share those duties with **C. R. Webster** in Chicago, and **E. E. Chamberlin** will have similar duties in the St. Louis office.

—o—

L. C. Rose, who joined Hamilton Metal Products Co., Hamilton, O., about six months ago as general manager, has been named vice president.

—o—

E. W. Ross has been appointed a director of Minneapolis-Moline Power Implement Co., Minneapolis, to succeed **N. A. Wiff,** who has served as vice president and director since 1929. Mr. Ross was formerly manager of the company's plant at Moline, Ill.

—o—

Forest D. Siefkin, general attorney, International Harvester Co., Chicago, has been appointed vice president in charge of industrial relations. He will continue to represent the company as attorney.

—o—

Charles B. Molloy, for the past six years general sales manager, General Blower Co., Chicago, has become associated with Power Engineering Co., Chicago, as a partner.

—•—

Dr. Norman A. Shepard, chemical director, American Cyanamid Co., New York, has been elected chairman of the American section, Society of Chemical Industry, and **Frank J. Curtis,** vice president, Monsanto Chemical Co., St. Louis, has been elected vice chairman.

—o—

Charles R. Hook Jr., since 1942 assistant to the president, Rustless Iron & Steel Corp., Baltimore, has been elected secretary and assistant to the vice president and general manager.

—o—

John B. Walker, assistant to the vice president of United Air Lines Inc., New York, has been elected vice president in charge of sales, Aircraft Accessories Corp., Kansas City, Kan.

—o—

O. J. Engle, comptroller of the Ordnance division, Pullman-Standard Car Mfg. Co., Chicago, has been appointed director of termination for the company's war contracts.

OBITUARIES . . .

William F. Joyce, 59, senior vice president and a director of "Automatic" Sprinkler Co. of America, Youngstown, O., died there Aug. 4. For many years Mr. Joyce was associated with the Grinnell Co., Providence, R. I. In 1926 he joined "Automatic" Sprinkler as assistant to the president, later becoming secretary, and still later, senior vice president.

—o—

Victor E. Decker, 51, proprietor of the Victor Screw Products Co., Burr Oak, Mich., and of the Decker Screw Products Co., Albion, Mich., died recently in Sturgis, Mich.

—o—

S. William Sigler, 51, president and treasurer, Aetna Core Sand Co., Chicago, died Aug. 4 in that city.

—o—

William J. Fair, 51, assistant superintendent of the Lorain, O., yards, American Ship Building Co., Cleveland, died July 30 in Lorain. In the shipbuilding business for 35 years, he was widely known throughout the Great Lakes region and was considered an expert in hull layout and construction.

—o—

J. A. Schermerhorn, 37, works manager, American Welding Co., Carbondale, Pa., wholly-owned subsidiary of American Car & Foundry Co., died Aug. 3.

—o—

William S. Stowell, 60, a director of American Cyanamid Co., New York, and president of the Chemical Construction Corp., New York, died there recently.

—o—

George Mason Jr., 63, who retired three years ago as vice president, Scully Steel Products Co., Chicago, now the United States Steel Supply Co., died Aug. 5 in Chicago.

—o—

Prof. C. H. Baxter, head of mining engineering, civil engineering and economics at Michigan College of Mining and Technology, died recently in Houghton, Mich. Prior to joining the college faculty in 1927, he was superintendent of Loretto Iron Co., Loretto, Mich.

—o—

Ned S. Reed, 51, plant manager of Eaton Mfg. Co., Marshall, Mich., and former plant manager and vice president of the company's branch at Windsor, Ont., died recently in Battle Creek, Mich.

—o—

Jacob Ullman, 84, a scrap iron jobber in Milwaukee since 1899, died Aug. 2 in that city.

—o—

Elmer J. Mercil, president, B. Mercil & Sons Plating Co. and Mercil Plating Equipment Co., Chicago, died there Aug. 7.

—o—

Angus MacLachlan, president, A. MacLachlan Valve Co., died Aug. 7 in Cleveland. Until recently he had been Cleveland district sales agent for Simplex Valve & Meter Co., Philadelphia, Chapman Valve Mfg. Co., Indian Orchard, Mass., and Manistee Iron Works Co., Manistee, Mich.

Diesel Engine Builders Expect To Hold Business in Postwar Era

Industry's wartime growth rapid. Manufacturers will have no troublesome reconversion problems, and will concentrate on extension of domestic and foreign markets. Believe diesels eventually will replace gasoline power plants

SAN FRANCISCO

DIESEL engine manufacturers in the San Francisco Bay area are unanimous in the belief that their war-stimulated growth will not vanish after the fighting stops.

With few or no troublesome reconversion worries, they can concentrate on the only major problem, extension of markets. To unify efforts to spur postwar sales of engines, five major diesel companies in this area recently have banded together as a local group in the framework of the Diesel Engine Manufacturers Association, a national organization with headquarters in Chicago. Corporate members of the new San Francisco unit are Enterprise Engine & Foundry Co., Atlas Imperial Diesel Engine Co., Joshua Hendy Iron Works, Lorimer Diesel Engine Co. and Union Diesel Engine Co. In addition, Fairbanks Morse & Co. is expected to be active in the group through its diesel branch office in San Francisco; Fairbanks also manufactures pumps here.

Plant executives of the diesel firms are confident that in the postwar period marine and stationary engines manufactured here will find a market all over the United States and in many foreign countries, especially in Russia and the Pacific nations. They believe, too, they can successfully invade new and expanding fields and they think potential world-wide expansion in the use of diesels with replacement of steam and gas units through revolutionary improvements will assure postwar markets.

As a foundation for postwar prosperity, the diesel manufacturers cite the industry's huge wartime growth here, terming it the fastest expanding industrial enterprise in the country with the exception of aircraft. Last year production of the five San Francisco area companies exceeded 500,000 horsepower, with a valuation of more than $50,000,000. More than 5000 workers now are employed, double the prewar level; in addition production in terms of man-hours has been stepped up tremendously. The ten-fold increase in output since beginning of the war is claimed to be the most sensational gain of any segment of the diesel industry in the nation.

As an indication of the phenomenal increase, Charles G. Cox, Enterprise Engine & Foundry vice president, reported that in 1939 his company turned out 41 engines and in 1943 more than 300, an increase in sales from $600,000 to $20,000,000. This year Enterprise will make an average of an engine a day, he said.

Diesel Officials Optimistic

Viewing postwar prospects, Mr. Cox said the San Francisco area could develop a unified program to sell engines to world-wide markets; that not much money or labor would be needed to make the rapid switchover to peacetime operations, and the plants would emerge from the war with many more models and sizes of engines. He foresees excellent chances of success in postwar era.

Other officials of diesel companies here are fully as optimistic. In fact, R. F. Anderson, a partner in Lorimer Diesel Engine Co., which operates in Oakland, is so sold on the outlook that he believes eventually diesels will replace gasoline motors. He foresees the capture of a large part of the marine engine field with replacement of most steam engines in ships with diesel power plants.

According to W. P. Wooldridge of Joshua Hendy, his company, which has just landed its first diesel contract of 70 engines for Maritime Commission coastal vessels, is experimenting on small 100 to 300 horsepower engines and the company hopes to develop a substantial civilian business in both stationary and marine diesels after the war.

G. F. Twist, vice president of Atlas Imperial Engine Co., forecasts great potential markets for the industry, mostly in marine engines and in generating plants. He also is optimistic for an expanding foreign market, pointing out that Atlas engines now are being used in nearly every part of the world.

INSPECTS WESTERN PLANTS: William A. Ross, left, president of Columbia Steel Co., and Benjamin F. Fairless, president of United States Steel Corp., are pictured above during a tour of inspection of Columbia's Torrance Works and Pittsburg Works in California

Government To Aid Industry Obtain

White paper warns necessity of maintaining large armed forces may prolong transition period. Numerous controls to be kept in effect after hostilities end to stabilize prices and wages and direct reconversion to civilian output

THE NEED to maintain large armed forces may prolong the transition period, the British white paper warns, so that the main problem for a time may be production with a limited labor force of an adequate quantity of goods, to improve the standard of living and to increase the volume of exports. "We shall be compelled during this period," it says, "to regulate imports and to manage our exchange resources with great care.

"On the other hand," it goes on, "the recuperative powers of modern productive technique are very strong. Under favorable external conditions, it may not be very long before production becomes adequate to meet the various calls upon it. When that happens, the first aim of employment policy—the maintenance of an adequate level of expenditure on goods and services—will no longer be realized automatically, as a by-product of the war effort or of reconstruction, but will call for the application of a policy deliberately directed toward that end."

The white paper goes into considerable discussion about the adverse effects that result when industries in a community or an area are not in balance. It mentions shipbuilding and heavy industries in the industrial belt of Scotland, coal and iron in South Wales, and cotton in Lancashire as examples. The first line of attack on the problem of unemployment in these unbalanced areas, it says, must be to promote the prosperity of the basic industries on which they primarily depend, coal, steel, engineering and shipbuilding. State control for those basic industries is a part of the plan.

Three Ways to Attack Problem

"It will be an aim of government policy," says the white paper, "to help these industries to reach the highest possible pitch of efficiency, and secure overseas markets. Secondly, these industries, and the areas which are largely dependent on them, will share in the benefits which will flow from the government's policy for maintaining domestic expenditure at a high level. But it will not be enough to rely on the general maintenance of purchasing power to solve all the problems of local employment. A solution on these lines alone would be too long drawn out and might involve the partial depopulation of industrial regions which are a national asset that we cannot afford to lose. The government, therefore, propose to attack the problems of local unemployment in three ways:

"1—By so influencing the location of new enterprises as to diversify the industrial composition of areas which are particularly vulnerable to unemployment.

"2—By removing obstacles to the transfer of workers from one area to another and from one occupation to another.

"3—By providing training facilities to fit workers from declining industries for jobs in expanding industries."

The white paper sets forth a long list of controls by which it intends to implement the attack on problems of local unemployment. These provide that when an employer intends to establish or move a plant, he must first get permission, also approval of the intended new location. They provide for disposition of government-owned plants, studies of area industrial problems, the methods by which enterprises will be able to obtain capital after the war, job training and retraining, and criteria covering removal of workers from one area to another. Various portions of the job are to be assigned to such government agencies as the Board of Trade, the Ministry of Labor and National Service, the Ministry of Town and Country Planning and the Scottish Office, with the overall responsibility centering in the Board of Trade.

Illustrative of the trend of present thinking in England with respect to organized labor, the white paper says: "If retraining schemes are to be a success there must be the fullest co-operation between employers and trade unions."

Addressing itself to the long-term problem, the white paper lists three essential conditions that must be satisfied to prevent unemployment crises:

"1—Total expenditure on goods and services must be prevented from falling to a level where general unemployment appears.

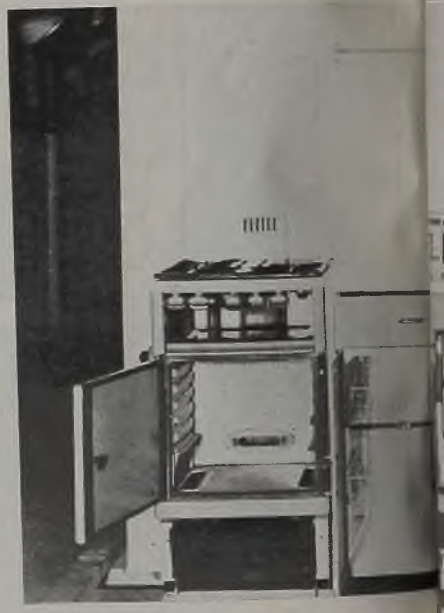
"2—The level of prices and wages must be kept reasonably stable.

"3—There must be a sufficient mobility of workers between occupations and localities.

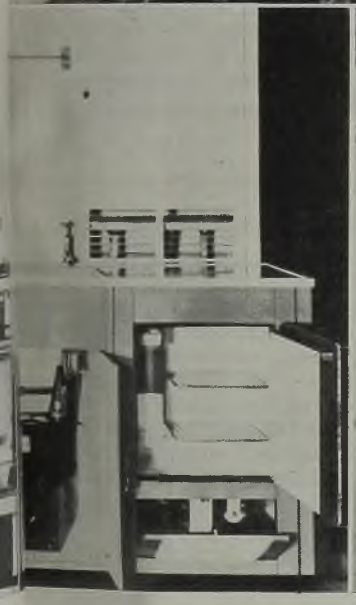
"If, for example," says the white paper by way of illustration, "there is a decline in the demand for steel for the erection of new buildings, unemployment will first appear among steelworkers. The steelworkers, in consequence, will have less to spend on food and other consumer goods, so that the demand for consumer goods will fall. This leads to unemployment among the workers in the consumer goods industries who, in turn, find their purchasing power reduced. As a result of this general loss of purchasing power in the community, the demand for new building is still further reduced and the demand for constructional steel falls once again.

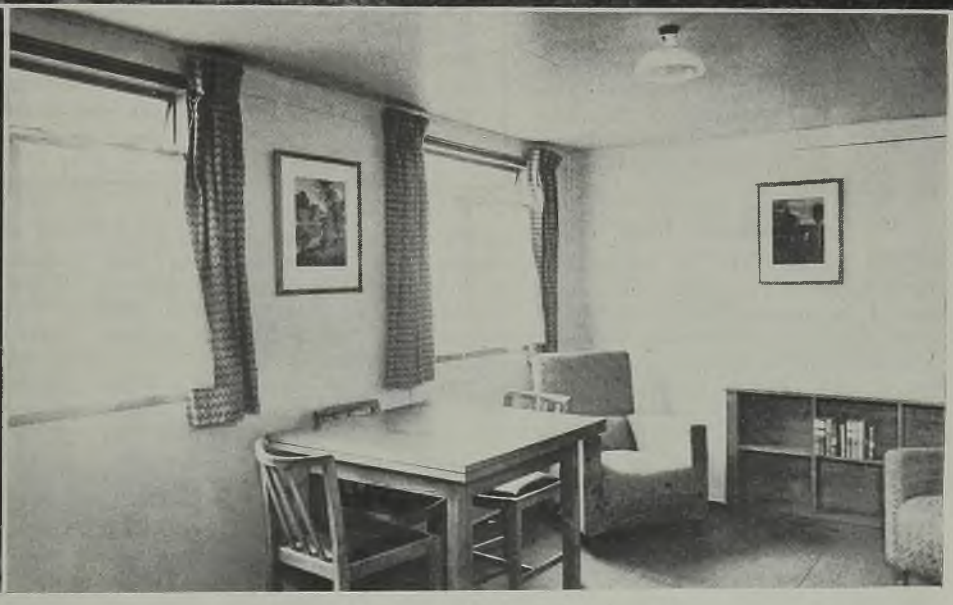
"This is an over-simplified illustration, but it is sufficient to make it clear that the crucial moment for intervention is at the first onset of the depression. A corrective applied then may arrest the whole decline; once the decline has

Wartime experience in producing factory-built houses to replace dwellings destroyed by German bombers and rocket bombs is expected to give pre-fabricated steel housing a fillip in the postwar era. At right is shown one of the emergency factory-made houses. At left below is a view of the kitchen side of a twin kitchen bathroom unit especially designed for the emergency houses. The unit is complete with stove, sink and refrigerator. At right below is a view of the living room. NEA photos.



This is the second of two installments on Great Britain's postwar planning, as set forth in a recent white paper. The first installment appeared in STEEL, Aug. 7, page 68.





spread and gathered momentum, interventions on a much greater scale would be required—and at that stage might not be effective.

"The government is prepared to accept in future the responsibility for taking action at the earliest possible stage to arrest a threatened slump. This involves a new approach and a new responsibility for the state."

Following a detailed discussion of the conditions under which the various types of expenditures fluctuate, the white paper lists as follows the "guiding principles" of the government's policy in maintaining total expenditure:

"1—To avoid an unfavorable foreign balance we must export much more than we did before the war.

"2—Everything possible must be done to limit dangerous swings in expenditure on private investment—though success in this field may be particularly difficult to achieve.

"3—Public investment, both in timing and in volume, must be carefully planned to offset unavoidable fluctuations in private investment.

"4—We must be ready to check and reverse the decline in expenditure on consumers' goods which normally follows as a secondary reaction to a falling off in private investment."

The white paper again points out that action taken by the government to maintain expenditure will be fruitless unless wages and prices are kept reasonably stable. "This does not mean that every wage rate must remain fixed. It does mean, however, that increases in the general level of wage rates must be related to increased productivity due to increased efficiency and effort. It will be essential that employers and workers should exercise moderation in wage matters."

The white paper expresses the belief that the power of public expenditure to check the onset of a depression has been underestimated because of the disposition among businessmen, when conduct-

ing their own affairs, to refrain from making investments when the outlook was dark. Public opinion, it says, must be brought to the view that periods of trade recession provide an opportunity to improve the permanent equipment of society by providing better housing, public buildings, means of communication, power and water supplies, etc.

"The government proposes," says the white paper, "to supplement monetary policy by encouraging privately-owned enterprises to plan their own capital expenditure in conformity with a general stabilization policy. The larger private enterprises may be willing to follow, in their own interests, the example set by the government in the timing of public investment and to adjust their activities accordingly. For to a strong and well-established business, confident of its long-run earning powers, there are obvious attractions in executing plans for expansion or for the replacement of obsolete plants at times when costs are low. And a wider understanding of the social importance of the aims of employment policy should inform and reinforce the interest which businessmen as a whole undoubtedly have in evening out fluctuations in capital expenditure."

If, despite the above approach, there still are swings in capital expenditure that promote instability, the government has another device which would come into play automatically and speedily—like a "thermostatic control." This would result from variations in the weekly contributions of employers and employed under the proposed new system of social insurance.

OLD-TIMERS: Frank Schmelz, left, takes over the charter meeting of the Quarter Century Club of Stewart-Warner Corp., Chicago, from George L. Meyer Jr., temporary chairman. Schmelz, a foreman in the company's drill press department, was elected unanimously to head the organization which is composed of employes who have served the company for 25 years or more

New Assessment Basis

"The standard rate of contribution would be assessed on the basis of a forecast of the average level of unemployment, in such a way as to keep the social insurance fund in balance over a number of years. But the rate of contribution actually levied would exceed the standard rate at times when unemployment fell below the estimated average level and would be less than the standard rate at times when unemployment exceeded this average.

"The effect of this scheme would be that, above a certain level of unemployment, a rise of two points in the unemployment percentage would decrease by an average of £500,000 a week the total of the social insurance contributions paid by workers in employment—apart from the corresponding reduction in the costs of employers. This would substantially augment the purchasing power in the hands of employed workers; and the additional money thus left in the hands of many millions of people would help to maintain demand for consumers' goods, thereby offsetting, at least in part, the decline in the expenditure of those who had lost their employment. This maintenance of purchasing power would reduce substantially the variations in total expenditure and employment."

A number of other devices for influencing the volume of consumption have been examined, says the white paper. One of these is a variation in the rates of taxation and the incorporation of some system of deferred credits as a permanent feature of national taxation.

"Since after the war a very considerable proportion of the national income will have to be taken in taxes, it is clear that relatively small variations in rates of taxation, whether effected by deferred credits or otherwise, will have a significant effect on the purchasing power available to the public and so on employment. "Deferred credits," the report explains, "are preferable to any system of direct variation which, apart from its other disadvantages, would come into operation more slowly than an effective policy demands. If experience should show that the variation of social insurance contributions was of value in keeping employment steady at a high level, but that another instrument for operating upon the volume of consumption was also desirable, it might well be a matter for consideration whether in prosperous times rather more taxation should be raised than was necessary for the budget requirements of the year and that excess treated as a credit repayable to the taxpayers in bad times."

Heart of the new postwar economic control will be a small central staff qualified to measure and analyze economic trends and submit appreciations of them to the ministers concerned.

"Particularly during the crucial early years of the scheme the responsibilities of this central staff will be very heavy; for many of the decisions required to carry out the government's employment policy will depend on quick and accurate diagnosis," says the white paper. "A slump may develop with fearful rapidity; in 1920-21 unemployment rose from 5 to 15 per cent in four months."

To serve the central staff, industry will be called on to submit more information than it ever has been asked for previously. In addition to the data it furnished prior to the war, British industry after the war will be asked for data such as the following:

"1—Statistics of employment and unemployment, including quarterly or monthly statements of present and prospective employment in the main industries and areas in the country.

"2—Regular information relating to savings, projected capital expenditure by public authorities and, as far as possible, by private industry.

"3—An annual census of production showing the structure of the main groups of industries in the preceding year, including details of the quantity

(*Please turn to Page* 202)

Kaiser, Standard Gypsum Co. Form Partnership

West Coast industrialists to mass produce and sell "core of postwar houses." Estimates cost can be cut 23 per cent

SAN FRANCISCO

HENRY J. KAISER revealed recently for the first time a broad outline of his postwar planning in the building materials and construction industries.

Details of the West Coast industrialist's intentions were disclosed in connection with announcement of a partnership arranged between the Kaiser Co. and Standard Gypsum Co. of California.

According to Mr. Kaiser his company plans to mass produce and sell "the core of postwar houses," including interior wall panels and whole sections such as kitchen, bathroom and laundry, utilizing a newly developed plastic cement which has the appearance of stucco. Lightweight steel produced at the Kaiser Fontana mill will be used for trusses, and fireproof and soundproof gypsum wallboards will go into interiors. Aluminum would be used for such purposes as window sills.

Every imaginable variety of architectural design will be employed, Mr. Kaiser said, and the houses can be built in the conventional method or by site fabrication or factory prefabrication. Mr. Kaiser estimated costs can be cut as much as 23 per cent.

The partnership agreement between Mr. Kaiser and Standard Gypsum Co. calls for the leasing, development and expansion of plants and markets for gypsum products with certain private financing. Mr. Kaiser and Samuel A. Perkins, president of Standard Gypsum, said the arrangement is without government aid. Mr. Perkins estimated value of Standard Gypsum properties at $20,000,000.

The partnership wil keep the name of Standard Gypsum Co., but will be re-incorporated in Delaware succeeding the California corporation.

Standard Gypsum operates plants in Long Beach, Calif., and on San Marcus Island in the Gulf of California.

Commenting jointly on the arrangement, Messrs. Perkins and Kaiser explained the partnership as a "50-50 proposition" and said the combination of Standard's business with the Kaiser Co.'s sand, gravel, cement, light metal and steel properties was "one of the biggest deals in the building materials industry on the Pacific Coast."

BRIEFS . . . .

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

Durabilt Mfg. Co., Aurora, Ill., recently purchased the property, assets and business of the Durabilt Steel Locker Co., Aurora, Ill.

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Oscar W. Hedstrom Corp., Chicago, has purchased 125 feet of frontage at 2022 North California avenue and is being occupied by the corporation's Army ordnance assembly plant formerly located at 1908 North Cicero avenue, Chicago.

—o—

Rheem Research Products Inc., Baltimore, has acquired a research and manufacturing branch at 714 W. Olympic boulevard, Los Angeles. New distributors appointed by Rheem are MacDermid Inc., Waterbury, Conn.; Wagner Bros., Detroit, and J. C. Miller, Grand Rapids, Mich.

—o—

D. D. Foster Co., Pittsburgh, equipment consultants, with offices at 412 Peoples Gas building, Pittsburgh, has been formed to handle engineering sales of specialized equipment for the oil, gas and chemical process industries in Pennsylvania, Ohio and West Virginia.

—o—

Western Pipe & Steel Co. of California, San Francisco, has distributed to prospective buyers of its steel products a 48-page pictorial booklet which illustrates its plants and products.

—o—

Chicago Ordnance District, Chicago, placed new orders for $1,438,335,000 worth of army weapons and other ordnance equipment during the first half of 1944.

—o—

Manning, Maxwell & Moore Inc., Bridgeport, Conn., has published a catalog covering the entire Consolidated line of valves for all industries.

—o—

American Car & Foundry Motors Co., New York, and the Brill Corp., New York, were merged on Aug. 1. The new name is ACF-Brill Motors Co.

—o—

Union Iron & Steel Co., Los Angeles, is fabricating conveyor supports for raw material conveyors for the Kaiser plant expansion.

—o—

National Bureau of Standards, Washington, reports its standing committee in charge of reviewing and revising Simplified Practice Recommendation R-35-28, steel lockers, has approved a revision of the recommendation and the Division of Simplified Practice has mailed copies to all interests for consideration and approval.

New Abrasive Plant Goes Into Production Aug. 15

Clayton Sherman Abrasive Co., Detroit, will be in production Aug. 15 at its new plant located at 3896 Lonyo road, Detroit. The company will have the capacity to produce approximately 100 tons of high grade shot and grit.

Production is under the supervision of B. P. Anderson, formerly associated with the Kalamazoo Stove Co., Kalamazoo, Mich. Sales in Michigan will be handled by the United Steel Supply Co., 529 Fisher building, Detroit.

Pressed Steel Tank Co. Reopens Two Branch Offices

Effective early in August, Pressed Steel Tank Co., Milwaukee, is reopening its branch offices in Chicago and Los Angeles. This expansion of the field organization is dictated by the company's plans to increase its service to customers.

Kenneth Cole will be in charge of the Chicago office at 208 S. LaSalle street. James Barr will be in charge in Los Angeles at 727 West Seventh street.

Wapakoneta Machine Knife Plant Nearing Completion

Wapakoneta Machine Co., Wapakoneta, O., is constructing a modern plant which is now nearing completion. This new plant will be devoted to production of all kinds of machine knives, shear blades, and circular slitters.

Wapakoneta officials say capacity for producing slitters will be increased between 200 and 300 per cent while production facilities for producing all types of knives will also be increased.

Laboratory of Babcock & Wilcox Marks Anniversary

Research activities of the Babcock & Wilcox Tube Co., Beaver Falls, Pa., growing from a laboratory with a staff of three persons to a $300,000 fully-equipped modern building with a personnel of more than 70 persons, were credited, on the approaching twenty-fifth anniversary of the laboratory, for helping to supply the United Nations with many kinds of tubing.

Since 1919 the plant has progressed from the production of only carbon steel tubing to the production of more than a hundred different types with many specialty tubes of varied alloy composition. In the conversion from peacetime to an accelerated wartime schedule, the company has become the largest producer of cold-drawn seamless Navy boiler tubing and boiler tubing for the merchant marine.

Munitions Output Heavy But Pressure Increases

MUNITIONS production continues in high gear although conflicting opinion between the various war agencies and the military authorities clothes the exact situation in a haze of uncertainty. Total munitions production, according to Donald M. Nelson, chairman, War Production Board, in June showed a dollar value of $5,380,000,000, 1 per cent less than in May and 3 per cent behind scheduled production for the month.

Most of the must programs—big guns, heavy artillery ammunition, heavy-heavy trucks, tractors, etc.—were on schedule or ahead during the month, Mr. Nelson reported, but he pointed out "this does not indicate that production of these particular items was up to military requirements." It appears schedules for many of these items have been set lower than desired in order to conform to production possibilities.

Evaluation of the record for June and the preceding five months shows that while all major groups are now over 46 per cent completed, there are numerous individual programs which are having serious difficulties.

At midyear the whole munitions program averaged 48 per cent complete. This average, however, is too optimistic in its implications if taken at face since it masks the degree of increase in output required for the remainder of 1944 in such items as heavy trucks, big guns, general purpose and fragmentation bombs, heavy artillery, and tractors.

AIRCRAFT—Aircraft still accounts for the largest single share of war production. June output of airframes, engines, propellers, spare parts, gliders, etc., amounted to $1,669,000,000, close to 31 per cent of all munitions production. Total of 8049 planes was turned out in the month, production being 4 per cent behind schedule on a dollar-value basis, and 5 per cent short on an airframe weight basis.

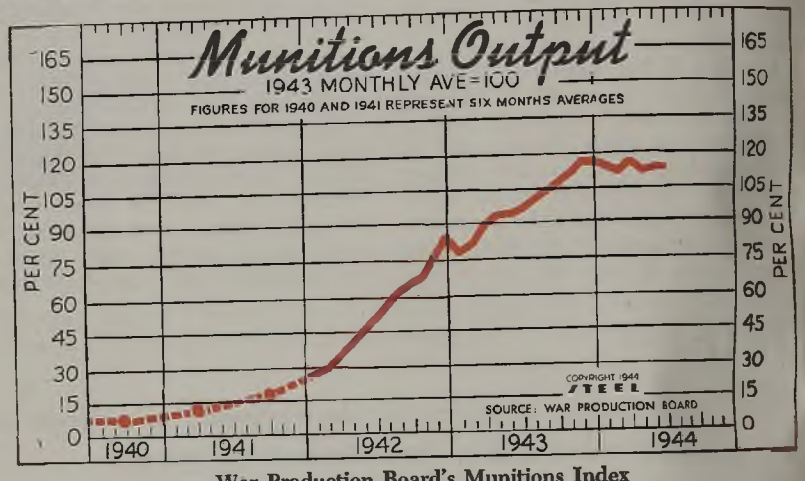
ORDNANCE AND VEHICLES—Ground army munitions rose 2 per cent, all critically needed items coming through on or above schedule. Production of heavy-heavy trucks declined 7 per cent in the month from the May level.

As a whole, production of tanks was 16 per cent over the May level and 9 per cent above the June schedule. Heavy artillery rose 9 per cent and met the upswinging schedule. Aerial bombs went 2 per cent ahead of May. Output of small arms was up to schedule.

SIGNAL EQUIPMENT—Communication and electronic equipment rose 5 per cent in June but was 6 per cent below schedule.

NAVAL SHIPS—Naval construction in June, at 309,070 displacement tons delivered, missed schedule by 4 per cent and fell 24 per cent behind the May record.

MARITIME SHIPS — Total maritime construction in June amounted to nearly 1,400,000 deadweight tons. Merchant ship deliveries dropped 11 per cent below the May mark, being 5 per cent behind schedule.



War Production Board's Munitions Index
(1943 Monthly Average = 100)

Month	1940	1941	1942	1943	1944
January	–	–	29	78	114
February	–	–	31	82	112
March	–	–	36	90	117
April	–	–	42	95	118
May	–	–	47	95	114
June	–	–	52	97	†114
July	–	–	58	101	
August	–	–	64	105	
September	–	–	67	108	
October	–	–	69	113	
November	–	–	76	118	
December	–	–	84	118	
	7*	11*	18*		

*6-Month average. †Preliminary.

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)	97	96	96	98
Electric Power Distributed (million kilowatt hours)	4,399	4,391	3,941	4,241
Bituminous Coal Production (daily av.—1000 tons)	2,058	1,998	2,003	2,019
Petroleum Production (daily av.—1000 bbls.)	4,651	4,608	4,579	4,203
Construction Volume (ENR—unit $1,000,000)	$31.8	$41.1	$18.9	$47.5
Automobile and Truck Output (Ward's—number units)	20,220	19,620	14,600	19,250

*Dates on request.

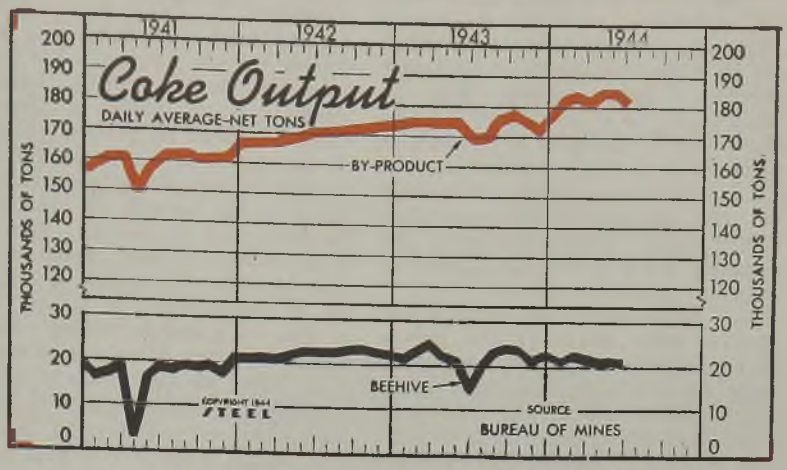
TRADE				
Freight Carloadings (unit—1000 cars)	900†	911	745	872
Business Failures (Dun & Bradstreet, number)	15	19	21	51
Money in Circulation (in millions of dollars)‡	$22,734	$22,584	$22,598	$18,014
Department Store Sales (change from like week a year ago)‡	+11%	+15%	+14%	+19%

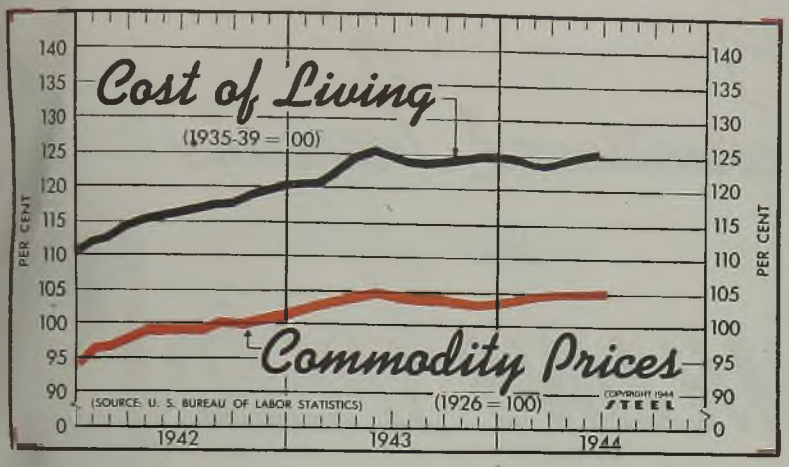
†Preliminary. ‡Federal Reserve Board.

Coke Output
Bureau of Mines

(Daily Average—Net Tons)

	By-Product		Beehive	
	1944	1943	1944	1943
Jan.	182,226	174,044	21,933	21,440
Feb.	184,384	175,099	22,248	23,987
Mar.	183,123	175,051	21,529	24,369
Apr.	185,259	175,857	20,457	22,948
May	184,071	174,400	20,783	21,200
June	181,891	168,900	20,481	14,000
July	.....	169,936	.....	20,009
Aug.	.....	176,396	.....	23,102
Sept.	.....	178,090	.....	23,637
Oct.	.....	175,492	.....	23,495
Nov.	.....	171,594	.....	20,421
Dec.	.....	179,042	.....	22,935
Average	.....	174,465	.....	21,795





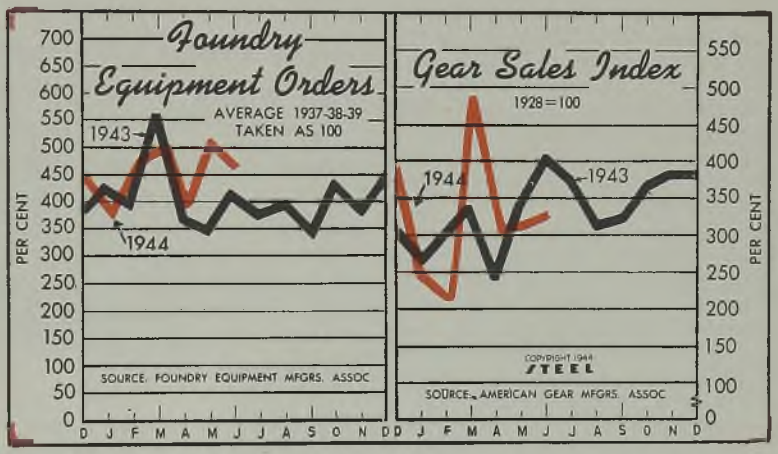
Wholesale Commodity Price—
Cost of Living Indexes

	Commodities (1926 = 100)			Living Costs (1935-39 = 100)		
	1944	1943	1942	1944	1943	1942
Jan.	103.3	101.9	96.0	124.2	120.6	112.0
Feb.	103.6	102.5	96.7	123.8	120.9	112.9
Mar.	103.8	103.4	97.6	123.8	122.8	114.3
Apr.	103.9	103.7	98.7	124.6	124.1	115.1
May	104.0	104.1	98.8	125.1	125.1	116.0
June	*104.3	103.8	98.6	125.4	124.8	116.4
July	....	103.2	98.7	.	123.8	117.0
Aug.	....	103.1	99.2	....	123.2	117.5
Sept.	....	103.1	99.6	....	123.9	117.8
Oct.	....	103.0	100.0	....	124.4	119.0
Nov.	....	102.9	100.3	....	124.1	119.8
Dec.	....	103.2	101.0	....	124.4	120.4
Ave.		103.2	98.8	....	123.5	116.5

*Preliminary.

Foundry Equipment and Gear Sales

	Monthly Average (1937-38-39=100)			Index (1928=100)		
	1944	1943	1942	1944	1943	1942
Jan.	378.3	429.8	532.7	246	268	288
Feb.	456.8	399.5	567.9	214	303	353
Mar.	498.4	562.7	1122.4	485	334	455
Apr.	385.7	862.7	1089.8	308	240	378
May	503.9	348.9	653.6	305	342	421
June	466.1	413.6	774.0	328	401	373
July	.....	379.4	800.8	...	374	344
Aug.	.....	390.4	510.8	...	312	380
Sept.	.....	346.6	446.4	...	320	351
Oct.	.....	436.6	540.6	...	368	268
Nov.	.....	388.0	338.8	...	337	359
Dec.	.....	442.8	382.5	...	337	300
Avg.	....	440.3	646.7	...	336	355



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$9,943	$9,961	$9,478	$8,955
Federal Gross Debt (billions)	$210.1	$209.1	$204.0	$146.4
Bond Volume, NYSE (millions)	$36.8	$36.8	$40.6	$46.5
Stocks Sales, NYSE (thousands)	4,504	4,153	7,844	4,730
Loans and Investments (millions)†	$57,065	$57,304	$55,036	$46,482
United States Government Obligations Held (millions)†	$41,837	$42,424	$39,917	$34,072

†Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$56.73	$56.73	$56.73	$56.73
Spot Commodity Index (Moody's, 15 items)†	249.6	250.2	249.3	245.2
Industrial Raw Materials (Bureau of Labor index)‡	113.8	113.8	114.6	113.0
Manufactured Products (Bureau of Labor index)‡	101.1	101.1	101.1	99.8

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

Sensational Increase in MILLING SPEED

can be attained with standard machine equipped with carbide cutters—provided utmost rigidity is engineered into the setup and a "momentum wheel" is used, report to Manufacturing Engineering Committee, ASME, shows

By J. H. GRAYSON
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WAR as well as bringing untold waste and destruction, invariably forces new ideas and methods to be developed which can be applied beneficially to peacetime activity. Tungsten carbides were developed and used in Germany during World War I, principally in the fields of turning and boring operations on cast iron and nonferrous metals. After peace had come, the benefits of this miraculous cutting metal spread throughout the industrial world in the manufacture of peacetime products.

New improvements in carbides and machine tools broadened the carbide field to include turning and boring of tough steel with characteristic speed and efficiency; and at the outbreak of World War II, cemented carbide lathe tools were used almost exclusively wherever there was high production.

To this time, little had been done in the application of carbides to milling operations. However, the pressure of wartime production milling schedules created a major bottleneck, and in the early part of 1942 the first highly satisfactory carbide milling technique was developed. Since that time, the metalworking industries have been witnessing revolutionary departures in the art of metal milling. Through the use of carbide-tipped cutters, superior finishes have been produced on steel and dural at speeds and feeds up to 1000 per cent of conventional rates.

Five Major Factors Indispensable

This new technique consists of five major factors:

1—All-inclusive rigidity of the machine, cutter, arbor, fixture and part.
2—Careful selection of speeds.
3—Heavy "chip load."
4—Climb milling or plunge cutting.
5—Constant momentum.

You may notice that some of these have been recognized for many years as good milling practice. True, with former methods these points have been considered beneficial; however, in carbide milling, especially of steel, they are indispensable.

Carbides will resist wear far more than "high speed" tool steel; but they are less resistant to shock and vibration, thus making rigidity a major factor. Moreover, the fact that a carbide cutter is best used at speeds and feeds up to 10 times ordinary rates further intensifies the importance of all-inclusive rigidity. Whenever possible, the cutter should be provided with a substantial supporting hub. Close mounting to the spindle nose is important—direct mounting, as in the case of a face mill, is ideal. Arbors should be of large diameter and well supported.

Complicated and cumbersome milling fixtures are not necessary—but another 50 or 100 per cent more than customary weight is recommended in almost all cases. Hydraulic or pneumatic clamping devices are often used to gain full advantage of stepped-up operations, but whatever the method, the seating and clamping must be *positive*. The problems of rigid holding should also be considered in the design of the part to be maintained. It is far better to plan for a carbide milling operation at the beginning, rather than to consider it only when all other means have failed.

Careful selection of speeds has always been considered good practice, but little consideration is given it in milling with "high speed" tool steel cutters. Here the safe speeds in tough steels are slow, but the range is wide, and can be easily estimated by a good operator. In carbide milling, however, tests have indicated that the best speeds are between 400 and 500 feet per minute for steel cutting, and higher for cast iron and nonferrous metals. Such speeds cannot be estimated merely by watching an operation, and variations to any great extent in one direction or the other might cause damage to the cutter. Lower speeds than those prescribed can result in vibration and chipping at the carbide cutting edges.

H'gher speeds may cause excessive tool wear. If vibration and "hammer action" is present in the recommended range, it may be offset by increasing momentum with an increase in speed. However, this purpose is best accomplished within the prescribed speed range, through the use of a "momentum wheel," which will be discussed below.

"Heavy chip load" is another of those good milling practices which have not been observed closely in milling with tool steel. Generally, the machine operator has used his instinct in determining both speeds and feeds. The term "chip load," or feed per tooth per revolution, therefore, is new to many shops. Here again is a *good* practice in conventional milling which becomes an *indispensable* practice in carbide milling (with especial reference to milling steel). The minimum chip load in cutting steel is 0.005-inch. Experiments indicate that future milling machines, with their inevitably added horsepower and increased rigidity, will make chip loads of 0.030-inch, and over, common practice.

Removing a heavy chip creates less heat, proportionately, than a light chip; further, the heat which is created will dissipate itself into a heavy chip to a greater extent than it will into a light chip. These facts offset the tendency

TABLE I

TESTS SHOW MOMENTUM WHEEL PROVIDES IMPROVED MACHINING

	Test "A"	Test "B"	Test "C"
Speed, feet per minute	425	900	425
Feed, inches per minute	15¾	20	15¾
Balance wheel	No	No	Yes
Remarks	Extreme vibration Poor finish	No vibration Good finish	No vibration Excellent finish
Parts machined before grinding	10	40	220

in high cutting speeds for the chip to "weld" to the cutting edge, and reduces the damage such "welded" chips cause in subsequent revolutions.

Proper chip load can mean the difference between 50 parts and 500 parts per cutter grind. Therefore its importance cannot be over-emphasized.

"Conventional" and "climb-milling" as well as plunge-type facing cuts are illustrated in Figs. 2, 3 and 4. The main advantage in climb and plunge cutting is their contribution to a chatter-free operation. Conventional, or "up," cutting tends to cause chatter when the tooth begins to rub off a chip of *no initial thickness*. Further, chips are more likely to adhere to the cutting edges in conventional milling whereas they are thrown free in climb milling.

Climb cuts are often impractical with present equipment, either because of lack of rigidity or the presence of feed screw and end play in machines not built for such milling. Climb cutting is practical only when such end play, or backlash, is less than 0.002-inch. Recently, methods and attachments for climb milling on modern machines not originally equipped have been developed by their manufacturers.

Plunge cutting can be practiced on all types of machines when the operation permits.

Although the best tool steel cutter and carbide cutter techniques appear to be basically the same, a new problem has arisen in the carbide milling of steel—that of maintaining a smooth cutting action through constant momentum. With a gear-driven machine the high cutting pressures are inclined to set up a "load-and-fire" action throughout the gear train as each tooth engages and leaves the work. This "hammer action" can be very injurious to the machine as well as to the cutter, and adequate momentum is the only effective means for combating it.

Formerly, momentum in carbide milling was obtained through excessive speeds and light chip loads, which produced a smooth cutting action but were very conducive to rapid tool wear and produced inconsistent results. With a heavy momentum wheel (100-200 pounds), as is shown in Fig. 3, vibrationless cuts can be made at a proper speed and with a heavy chip load, thus producing ideal results. The comparisons in Table I illustrate this fact.

Increased productivity as shown in the table makes the momentum wheel a valuable addition for carbide milling on any machine.

Up to this point, the main subject has been the carbide milling of steel. The technique for cast iron, nonferrous metals and nonmetallics consists of the same principles, but the importance of each point is considerably lessened. As a result, such materials can be efficiently

(*Please turn to Page* 142)

Fig. 1 (Below)—Vibrationless cuts can be made at most efficient speeds and feeds with excellent results when the machine is equipped with a momentum wheel, such as in the case of this Kearney & Trecker miller

Fig. 2 (Top, right)—Conventional or "up" milling with carbide cutters tends to cause chatter when the tooth begins to rub off a chip of no initial thickness. Chips also are likely to adhere to the cutting edges

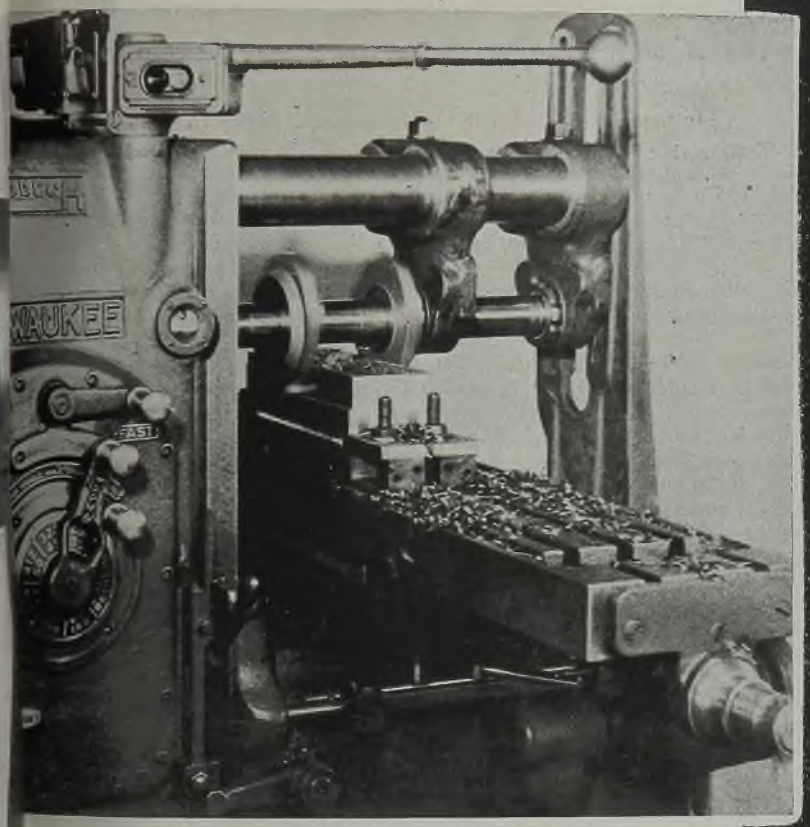


Fig. 3 (Center, right)—Climb cuts often are practical with present equipment either because of lack of rigidity or presence of feed screw end play in machines not built for milling with carbides

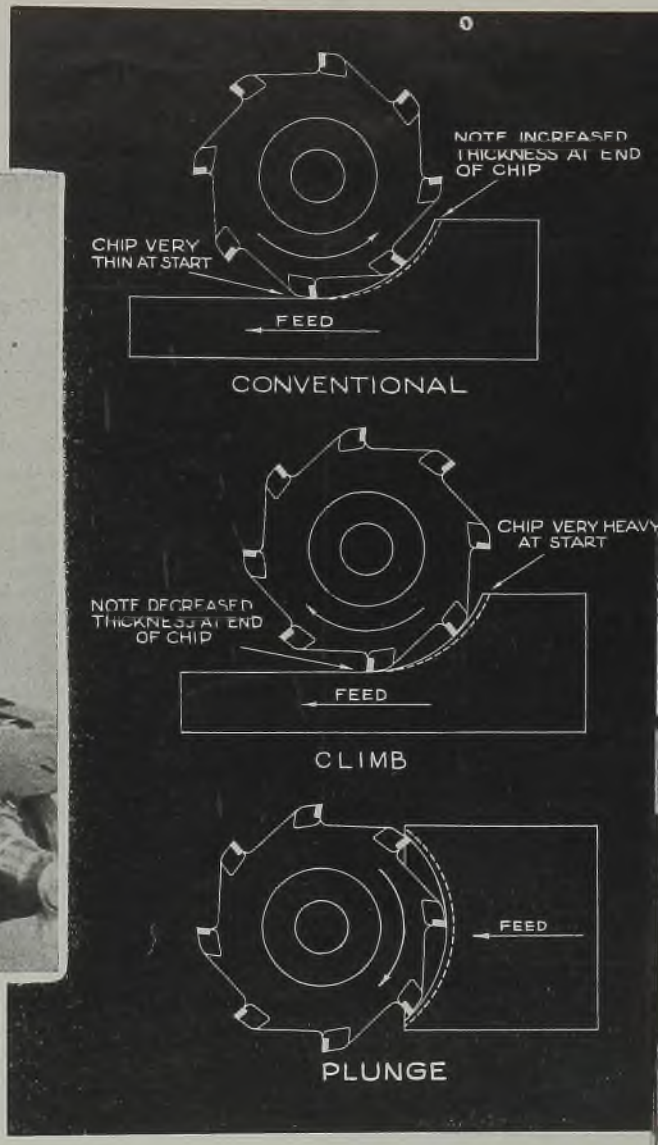
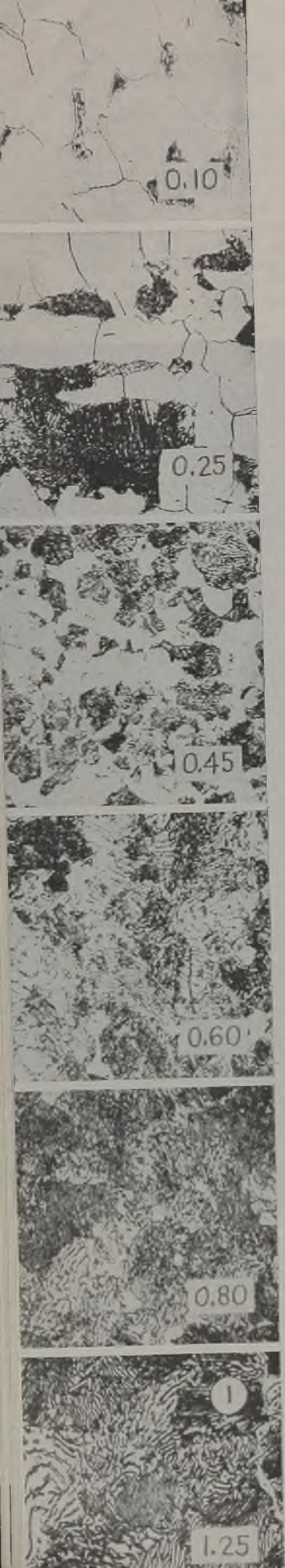


Fig. 4 (Bottom, right)—Plunge cutting with carbides may be practiced on all types of machines when the operation permits



Selecting

on the basis of carbon conten

Tensile test and microscopic data are presented to show that in the selection of a steel for a particular application, the primary consideration is choice of proper carbon content. Data on effect of other alloying elements are also included

By A. S. JAMESON
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International Harvester Co.
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Chicago

CARBON is the master alloying element. The development of the iron and steel age to its present level is mainly the result of alloying of carbon with iron. Carbon made possible the heat treatment of iron and steel, increasing tensile strengths from under 50,000 to over 300,000 pounds per square inch.

Other alloying elements such as silicon, manganese, chromium, nickel and molybdenum, although they have other important effects, principally tend to increase the size of the structural piece in which the higher tensile strength can be obtained.

Annealed Pearlitic Steels: In slowly cooled steel examined microscopically, an increase in the carbon content is evidenced by an increase in the microconstituent known as pearlite. See Fig. 1.

An increase in the microconstituent pearlite results in an increase in the tensile strength of the steel. The tensile strength of ferrite, that is, iron without carbon, is theoretically estimated to be about 40,000 pounds per square inch with an elongation of about 50 per cent in a 2-inch gage length and that of pearlite to be about 115,000 pounds per square inch with an elongation of about 10 per cent. From this it can be deduced that an increase in the pearlite content would result in an increase in the tensile strength of the steel.

At about 0.85 per cent carbon, a new constituent appears in the microstructure of slowly cooled steel, located mainly at the grain boundaries. This constituent, known as cementite, forms the dark band in the pearlite constituent. But as pearlite is a definite mechanical mixture and as steel only requires a carbon content of about 0.85 per cent to form this definite mechanical mixture, any excess cementite is rejected as such as slow cooling. The presence of cementite (which is a brittle constituent) at the grain boundaries causes a marked decrease in the tensile strength at about 1.10 per cent carbon. Tensile strengths of steel with increasing carbon content is shown in Fig. 2.

Fig. 2 should be interpreted as bands rather than lines because all commercial steels contain alloying elements in various proportions either as additions or impurities which affect the tensile strength. The alloying elements which cause variation in the theoretical tensile strength of slowly cooled iron-carbon alloys are silicon, phosphorus, manganese, copper, nickel and probably molybdenum, as these elements enter the solution in the ferrite constituent and thereby increase its strength.

Grain size is also a factor in affecting the tensile strength of slowly cooled steel.

Normalized Sorbitic Pearlite Steels: Many steels are used in the normalized or air-quenched condition. In this instance the microstructure produced is not pearlite, that is, the pearlite is not in its normal lamellar form but is referred to as sorbitic pearlite. At times when the alloy content is high and the section is small, the air cooling may be fast enough to form martensite and troostite rather than sorbitic pearlite. In the main, however, the cooling is

Fig. 1—Microstructure of iron with increasing carbon content, annealed from 1680 degrees Fahr.; etched in nital; shown at 300 diameters

Fig. 2—Tensile properties of annealed steels—pearlitic structures

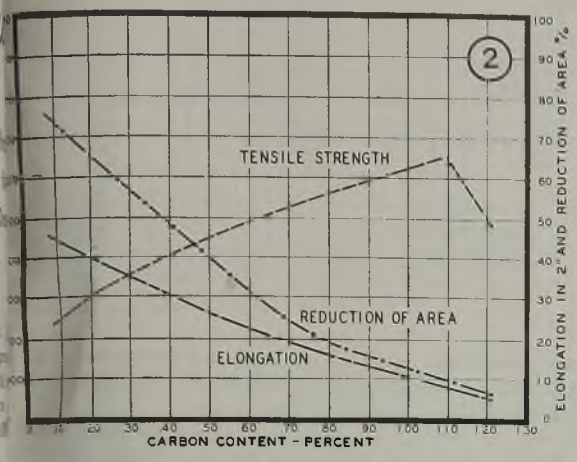
Fig. 3—Tensile properties of normalized steels with sorbitic-pearlite structures

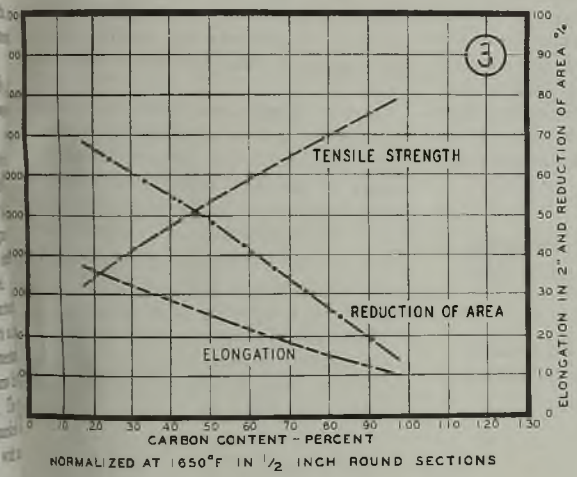
Fig. 4—Maximum hardness and critical hardness at different carbon contents

Fig. 5—Microstructure of 0.45-0.50 alloy steels; nital etch; 1000 diameters

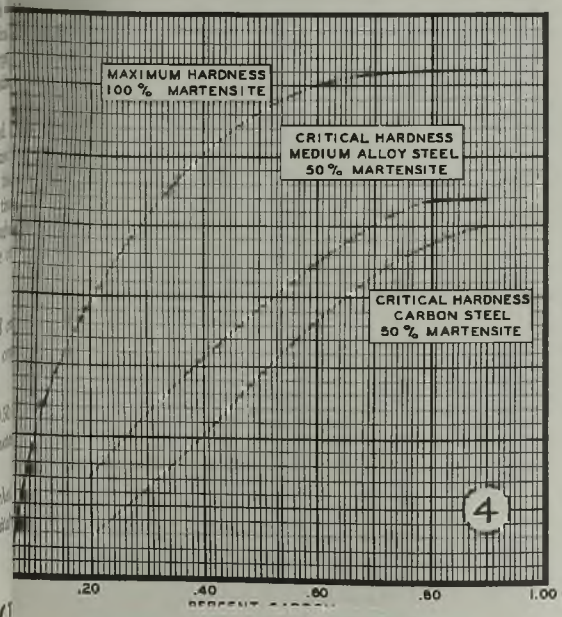
Fig. 6—Microstructure of quenched and quenched-and-tempered steels; nital etch; 1000 diameters

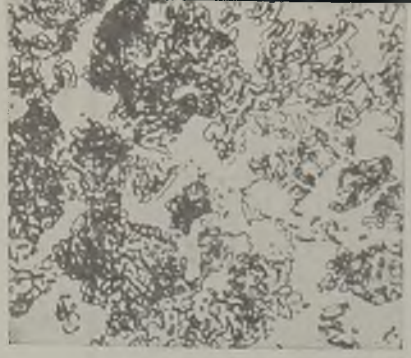
tin Steels

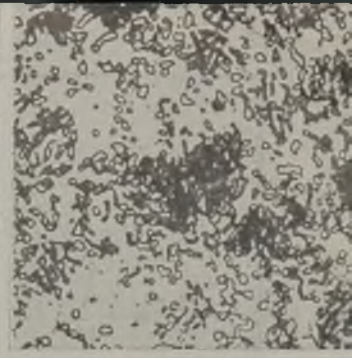


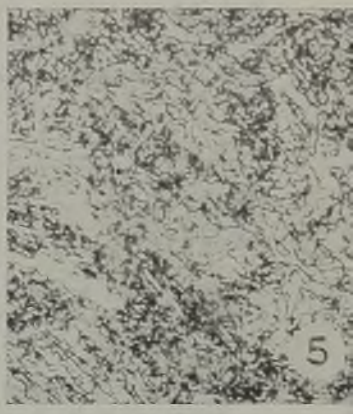


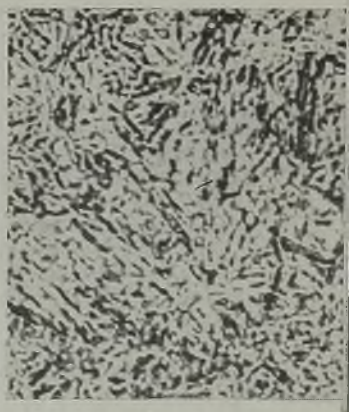
NORMALIZED AT 1650°F IN 1/2 INCH ROUND SECTIONS

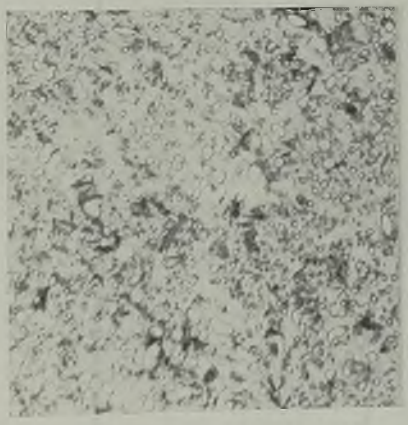


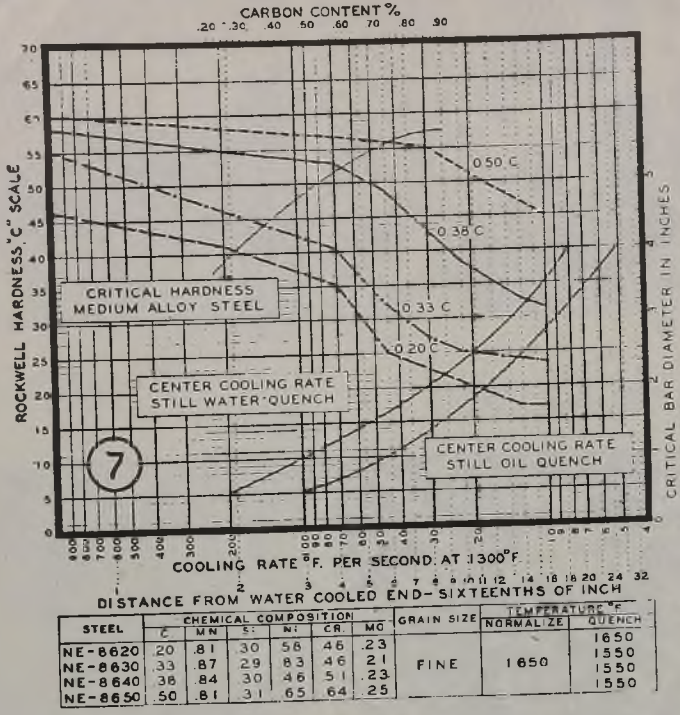




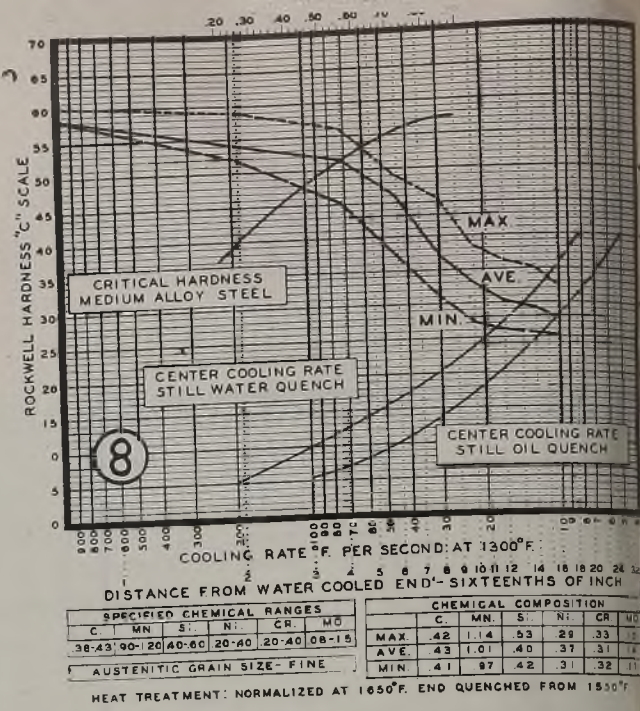








STEEL	CHEMICAL COMPOSITION C	MN	SI	NI	CR	MO	GRAIN SIZE	TEMPERATURE °F NORMALIZE	QUENCH
NE-8620	.20	.81	.30	.56	.46	.23	FINE	1650	1650
NE-8630	.33	.87	.29	.83	.46	.21			1550
NE-8640	.38	.84	.30	.46	.51	.23			1550
NE-8650	.50	.81	.31	.65	.64	.25			1550



SPECIFIED CHEMICAL RANGES C	MN	SI	NI	CR	MO
.38-.43	.90-1.20	.40-.60	.20-.40	.20-.40	.08-.15

AUSTENITIC GRAIN SIZE - FINE

CHEMICAL COMPOSITION	C.	MN.	SI.	NI.	CR	MO
MAX.	.42	1.14	.53	.29	.33	.15
AVE.	.43	1.01	.40	.37	.31	.14
MIN.	.41	.97	.42	.31	.32	.11

HEAT TREATMENT: NORMALIZED AT 1650°F. END QUENCHED FROM 1550°F.

slow enough to avoid the presence of martensite. At any rate, the true object of normalizing would be to produce sorbitic pearlite with the suppression of the precipitation of the excess constituent whether it be ferrite or cementite.

Unlike the condition previously discussed in the full annealed condition where the alloys such as chromium, nickel, manganese, molybdenum do not have any effect on the strength except as in the case of manganese and nickel where they act only as ferrite strengtheners, these alloys have hardenability effects. Molybdenum is especially effective in producing hardness on air cooling. There are many ways of defining hardenability, it will be defined now as meaning the ability of a steel having high hardenability, as opposed to one having low hardenability, as one which produces a higher hardness in a given section when air cooled.

In normalizing treatments, assuming the air to be relatively still and at a temperature of say 85 degrees Fahr., the cooling rate can only vary as the size of the piece of steel being cooled changes. It is obvious that a 3-inch round will cool slower than a ½-inch round and that at any distance from the surface any part of the interior of a 3-inch round will cool at a slower rate. This is because the rate of cooling does not depend entirely on the rate of the extraction of heat from the surface but also on the rate of transference of heat through the steel from the center to the outside of the section.

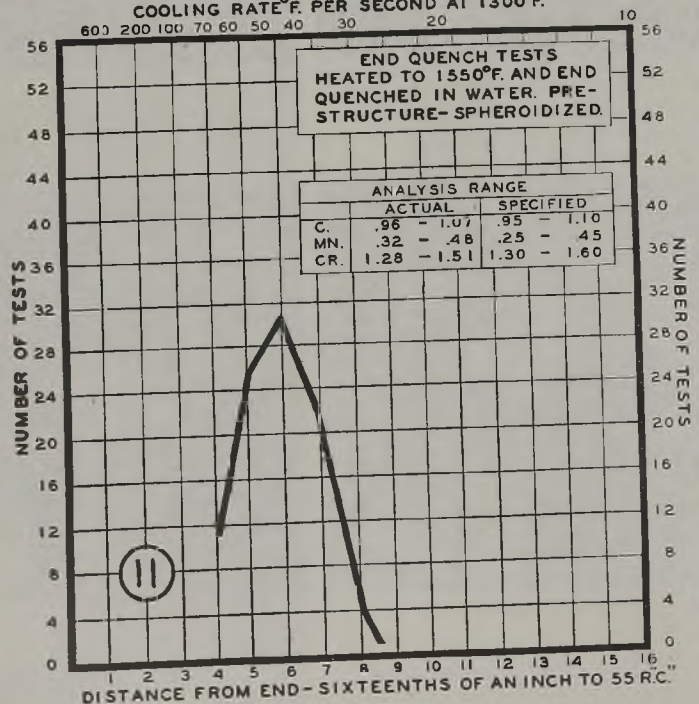
In practice, engineering design usually determines the size of the piece and it is up to the metallurgist to determine what plain carbon or alloy steel to use in order to produce the desired physical properties at the minimum fabricating cost.

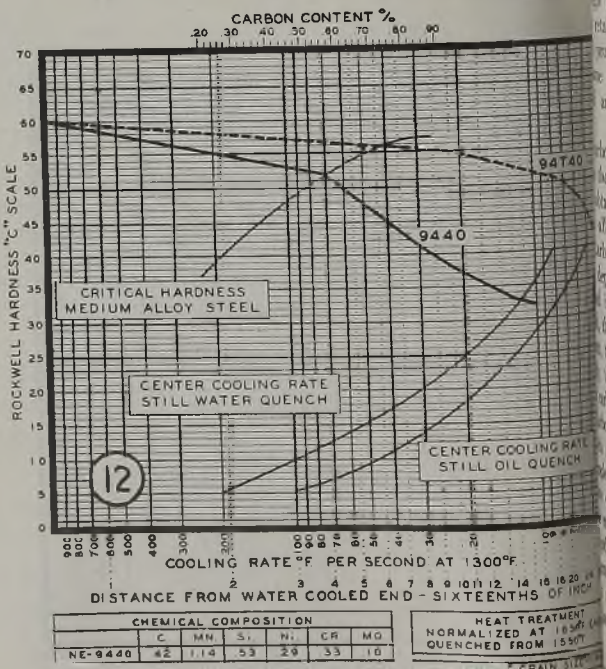
Fairly high and uniform physical properties can be obtained by normalizing, providing the proper selection is made of the steel both as to carbon and alloy content so as to obtain a fair degree of uniformity of microstructure from center to outside of the piece. A greater degree of uniformity can be obtained by tempering after normalizing.

The physical properties obtained by this method of heat treatment are usually not as high as are obtained by water or oil quenching to produce martensite

Fig. 11—Hardenability frequency curve for 95 heats of AISI NE-52100 A

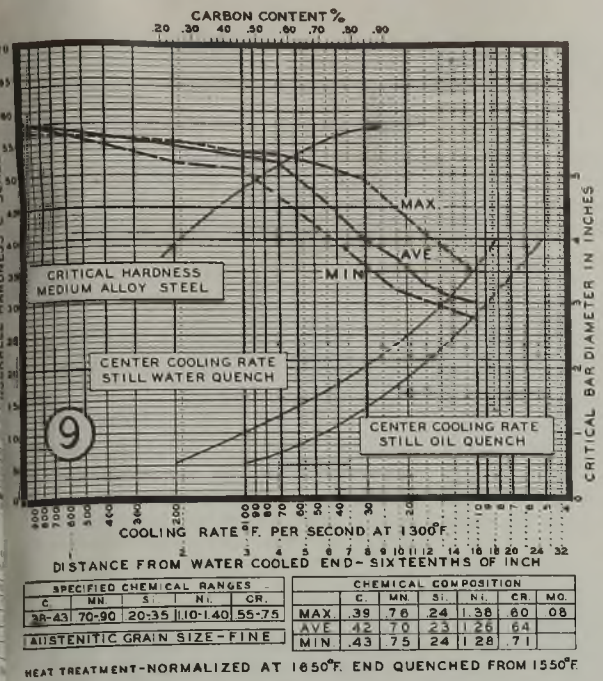
Fig. 12—Comparative hardenability of NE-9440 and NE-94T40; end quench tests





CHEMICAL COMPOSITION	C	MN	SI	NI	CR	MO
NE-9440	.42	1.14	.53	.29	.33	.10

HEAT TREATMENT NORMALIZED AT 1650°F. QUENCHED FROM 1550°F.



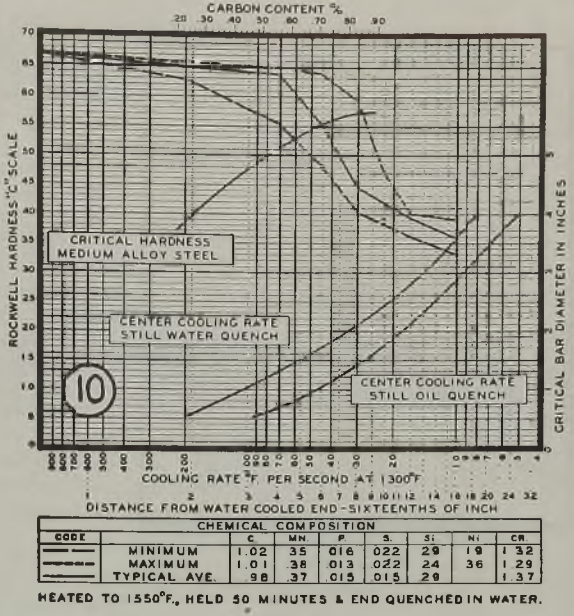
SPECIFIED CHEMICAL RANGES				
C.	MN.	Si.	Ni.	CR.
38-43	70-90	20-35	1.10-1.40	.55-.75

AUSTENITIC GRAIN SIZE - FINE

CHEMICAL COMPOSITION						
	C.	MN.	Si.	Ni.	CR.	MO.
MAX.	.39	.76	.24	1.38	.60	.08
AVE.	.42	.70	.23	1.26	.64	
MIN.	.43	.75	.24	1.28	.71	

HEAT TREATMENT-NORMALIZED AT 1650°F. END QUENCHED FROM 1550°F.

Fig. 7—Effect of carbon content on hardenability of AISI NE-8600 series steels



CHEMICAL COMPOSITION							
CODE		C.	MN.	P.	S.	Si.	Ni.	CR.
———	MINIMUM	1.02	.35	.016	.022	.29	.19	1.32
- - - -	MAXIMUM	1.01	.38	.013	.022	.24	.36	1.29
———	TYPICAL AVE.	.98	.37	.015	.015	.29		1.37

HEATED TO 1550°F., HELD 50 MINUTES & END QUENCHED IN WATER.

Fig. 8—Variation in hardenability of AISI NE-9440 steel; end quench tests

Fig. 9—Variation in hardenability of AISI A-3140 steel; end quench tests

Fig. 10—Hardenability of AISI NE-52100 A steel; end quench tests

followed by tempering to produce sorbite. The yield strength and the elongation and reduction of area values are lower. The best results are obtained from normalizing the medium carbon steel ranging from 0.35 to 0.60 per cent carbon.

The effect of normalizing on the tensile properties of plain carbon steel in ½-inch sections with increasing carbon content is shown in Fig. 3.

A comparison of the annealed, normalized and normalized and tempered tensile properties of A-4042 and NE-8650 steels are shown in Table 1.

The change in microstructure from the annealed to the normalized condition is illustrated in Fig. 5. The increase in tensile strength is due to a more uniform distribution of the ferrite and to a smaller grain size as well as to the fact that sorbite itself is stronger than pearlite.

Quenched and Tempered Martensitic and Sorbitic Steels: The best physical properties are obtained by cooling rapidly enough to produce martensite and either by retaining martensite or by tempering to produce sorbite. Fig. 6 illustrates some typical microstructures of quenched and quenched-and-tempered steels.

The carbon content of the steel determines the maximum hardness which can be obtained by quenching, see Fig. 4. The alloys appear to have little effect. Carbon also has in itself an effect on the depth of hardness which can be obtained in a given section. It could be said, then, that the higher the carbon content, the higher will be the hardenability, that is, up to about 0.85 per cent carbon.

Carbon in excess of this amount, which is the amount which produces a complete lamellar pearlitic structure on slow cooling, has little effect on either the maximum obtainable hardness or the depth of hardness penetration. The term "hardenability" will be used here to mean the ability of the steel to produce a 50 per cent martensitic structure

TABLE I—TENSILE PROPERTIES, ANNEALED AND NORMALIZED ½-INCH SECTIONS

Material	Treatment	Carbon Content	Yield Strength PSI	Tensile Strength PSI	Elongation % in 2"	Reduction of Area %	Hardness Brinell
A-4042	A-1500°F	0.45	56 000	93 000	27	50	169
	N-1650°F	0.45	86.000	120 000	20	51	228
NE-8650	A-1500°F	0.45	55 000	91.000	30	47	165
	N-1650°F	0.45	107 000	158 000	9	18	260
	N-1650°F.-T-1000°F.	0.45	108.000	140,000	17	56	253

TABLE II—THE EFFECT OF CARBON CONTENT ON THE HARDENABILITY OF AISI NE-8600 SERIES STEELS

Carbon Content Per cent	Reference Point (R "C" Hardness)	Bar Size in which Reference Point Hardness is obtained at center: Still Oil Quench (Inches)	Still Water Quench (Inches)
0.20	39	...	0.6
0.33	42	0.5	1.0
0.38	46	1.3	1 9
0.50	49	2.1	2.7

TABLE III—VARIATION IN HARDENABILITY NE-9440, A-3140 AND NE-52100-A

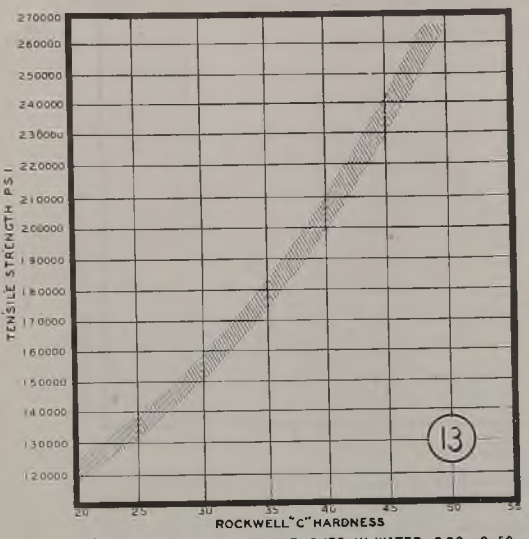
Steel	Reference Point (R "C" Hardness)	Bar Size in which Reference Point Hardness is obtained at center: Still Oil Quench (Inches)	Still Water Quench (Inches)
NE-9440	47	Min. 0.6	1.1
		Max. 1.2	1.9
A-3140	47	Min. 0.7	1.8
		Max. 1.6	2.2
NE-52100-A	57	Min. 0.6	1.1
		Max. 1.5	2.1

TABLE IV—COMPARISON NE-9440 AND NE-94T40

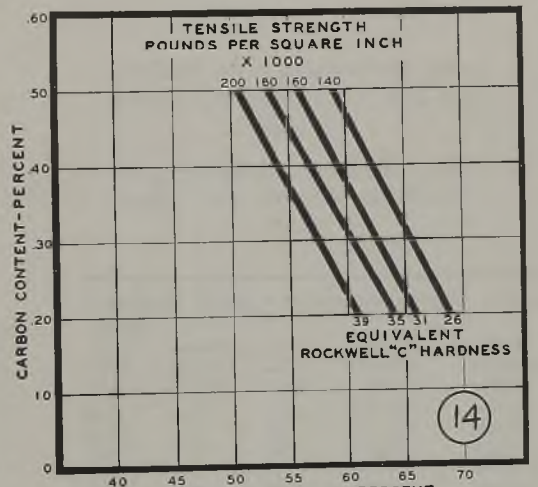
Steel	Reference Point (R "C" Hardness)	Bar Size in which Reference Point Hardness is obtained at center: Still Oil Quench (Inches)	Still Water Quench (Inches)
NE-9440	47	1.0	1.6
NE-94T40	47	3.9	...

TABLE V—TENSILE PROPERTIES ANNEALED PEARLITIC vs. SPHEROIDIZED ANNEAL

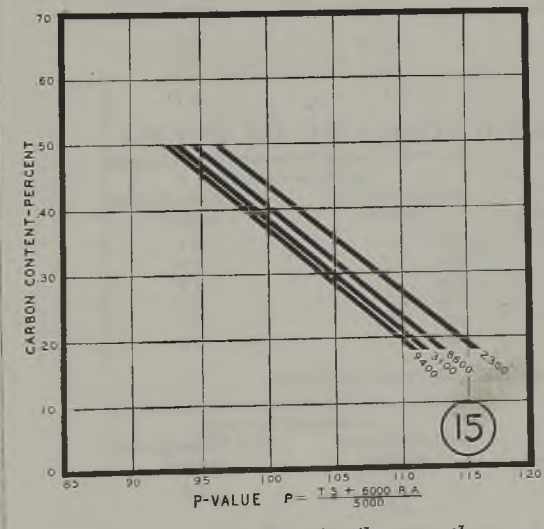
Structural Condition-Annealed	Yield Point PSI	Tensile Strength PSI	Elongation % in 2 inches	Reduction of Area %	Hardness R "B"
Pearlitic	57,450	120,800	9.0	10.8	99
Spheroidized	47,500	85,600	28.5	55.2	82



½" SECTIONS. 0.20-0.30 QUENCHED IN WATER. 0.30-0.50 QUENCHED IN OIL AND TEMPERED TO VARIOUS HARDNESS.



0.50 INCH A.S.T.M. TEST BARS
.20-.30 CARBON-WATER QUENCHED, .30-.50 CARBON-OIL QUENCHED AND TEMPERED TO THE INDICATED TENSILE STRENGTHS.



at a given cooling rate. The slower the cooling rate at which a 50 per cent martensitic structure can be obtained the higher the hardenability of the steel.

Fig. 7 illustrates the effect of carbon on the hardenability of the AISI NE-8600 series steels. It must be stressed that the curves for each carbon content of the NE-8600 series steels can be considered to be exact values because of the necessary manufacturing tolerances for the alloy contents of this or any other series of alloy steels.

It also appears that certain variables such as grain size characteristics, melting practice and small amounts of other elements not part of the specified alloy contents have an effect on hardenability.

The spread for NE-9440 and A-3140 as determined from a number of heats is given in Figs. 8 and 9.

In the higher carbon steels the same variations are evident. Fig. 10 shows the spread for 95 heats of NE-52100-A steel.

A great deal of attention is being paid, at the present time, to the variation of hardenability within one alloy specification. There is a program underway sponsored by the American Iron & Steel Institute and the Society of Automotive Engineers to gather sufficient data for statistic analysis of the variation of hardenability within one analyses range.

The spread for NE-52100-A is shown in the form of a frequency curve in Fig. 11.

Hardenability Important Factor

There is no need to go into detail where the comparison of the hardenability of the various alloy combinations as a method has been worked out to calculate theoretically the hardenability of any alloy composition, using factors for the alloying elements which within certain limits can predict the hardenability for any alloy composition.

Considerable time is also devoted to experimentation of the effect on small boron additions to SAE steel. The effect of the addition of a small quantity (3.6 pounds per ton) of an aluminum, titanium, zirconium and boron compound, (Ti-20.0, Al-13.0, Mn-8.0, Zr-4.0 and B-0.5 per cent) on the hardenability of NE-9440 is shown in Fig. 12 for the same heat of steel. Alloy steels treated in this manner are designated with a letter "T" between the first two and last two numerals.

A form which has been devised for recording hardenability is prepared so that hardenability may be conveniently recorded in terms of bar size.

The data given in Figs. 7, 8, 9, 10 and 12 are shown in Tables II, III, and IV for convenient comparison.

Hardenability is of great importance where tensile properties are under consideration for the highest tensile properties obtained only under conditions where at least a 50 per cent martensitic structure is obtained on quenching. As the rate of heat transfer from a given diameter bar is constant assuming a given quenching medium such as water or oil, the production of at least a 50 per cent martensitic structure depends on the ability of a given analysis to produce this condition in a given bar size. It is a generally accepted principle that regardless of the analysis, the tensile strength of a bar quenched out to at least a 50 per cent martensitic condition and tempered will have the same tensile strength at the same hardness level. As a matter of fact this is not exactly true, for a bar quenched out to a 100 per cent martensitic structure will have a higher tensile strength for a given hardness than one quenched out to produce a 50 per cent martensitic structure. But for all practical purposes we can assume that the difference is not great enough to take into consideration in ordinary usage.

Nickel Steels Show Higher Values

The relationship of the hardness to the tensile strength of AISI NE-8600 series ranging in carbon content from 0.20 to 0.50 is shown in Fig. 13. These data were obtained from ½-inch sections, the 0.20-0.30 per cent carbon steel being quenched in water, and the steel with a carbon content over 0.30 per cent quenched in oil. It may be assumed that for this data and other tensile test data given later, that the complete section tested was quenched out to at least a 50 per cent martensitic microstructure before tempering.

There is also a close similarity in the reduction-of-area and the elongation values for both carbon and alloy steels when heat treated by hardening and tempering to the same hardness or tensile strength values. However, the carbon content of the steel does have an effect on the elongation and reduction of area values. The lower the carbon content the greater are these values for a given hardness or tensile strength up to 200,000 pounds per square inch. See Fig. 14.

Again, this statement is not true for every heat of steel tested, as there appear to be variations in the melting and fabrication of the material which effect the elongation and reduction of area values obtained.

Higher elongation and reduction of area values for the same tensile strength are also obtained from certain alloy combinations. The steels containing nickel usually show higher values and those containing manganese over 1 per cent show lower values. Whether these differences are significant is the subject of some doubt, however, higher impact values are obtained from steels showing differences of 10 to 20 per cent in reduction of area values. Using a method of evaluation known as the "P" value, the effect of carbon content and also a

Fig. 13—Tensile strength versus hardness of AISI NE-8600 series

Fig. 14—Effect of carbon on relationship of tensile strength to reduction of area of AISI NE-8600 series

Fig. 15—Carbon content versus "P" value of ASTM 0.5-inch test bars at 30 rockwell C or 155,000 pounds per square inch tensile strength

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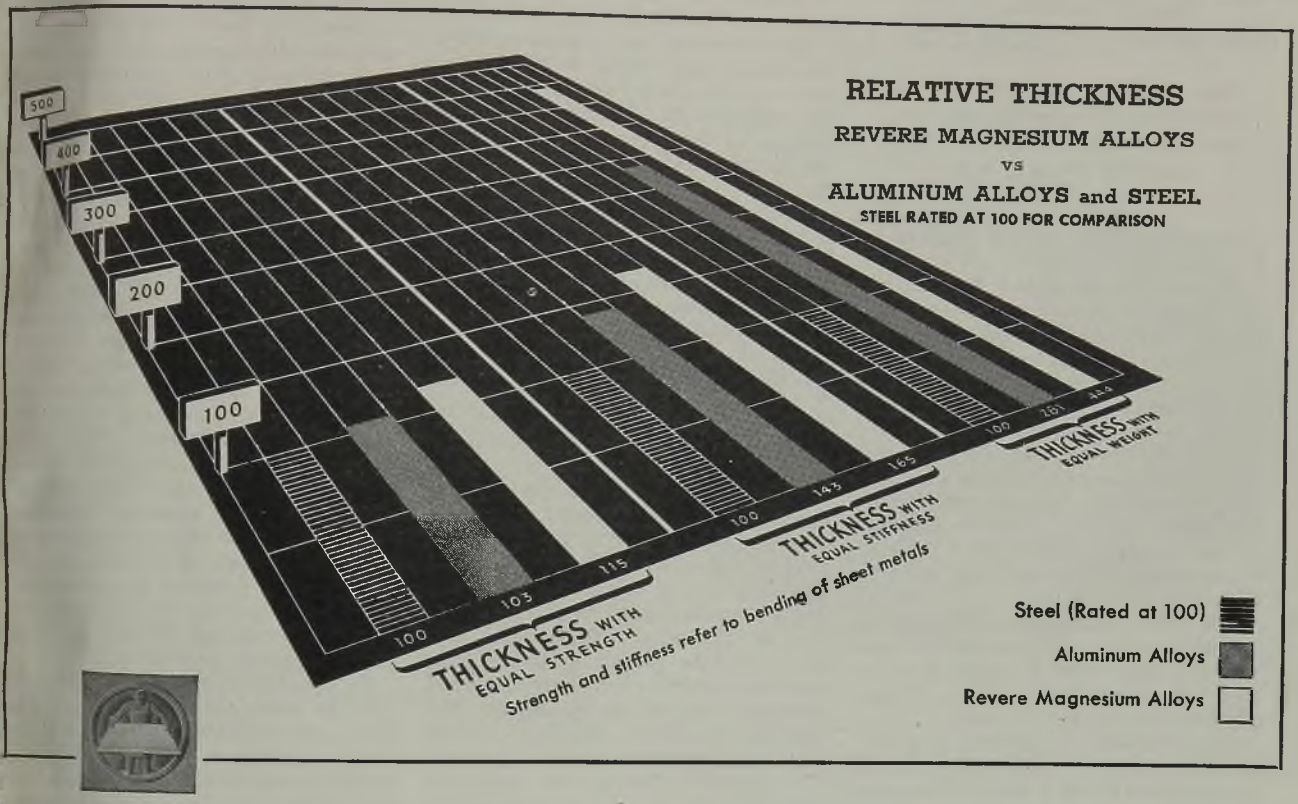
Revere Magnesium Alloys



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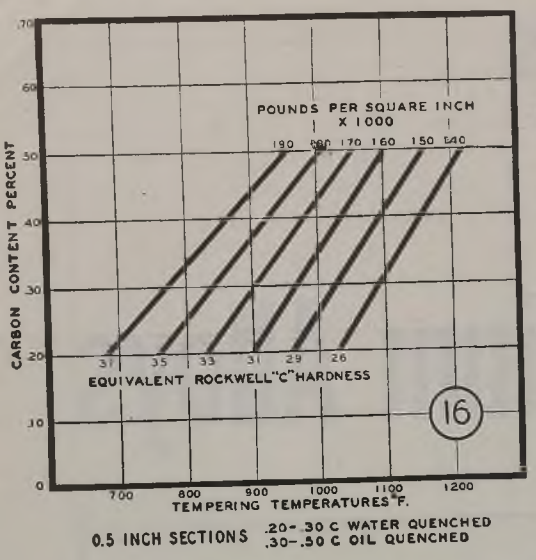

Fig. 16—Effect of carbon on relationship of tempering temperature to tensile strength of AISI NE-8600 series of steels

comparison of four analyses is shown in Fig. 15.

It should be understood that as illustrated previously during a discussion of hardenability there is considerable variation between different heats of steel within the same analysis range and for this reason the values shown in Fig. 15 should not be interpreted too literally.

The carbon content of the steel as well as the alloy composition has a considerable effect on the tempering temperature required to produce a certain hardness or tensile value. The effect of the carbon content is illustrated for the NE-8600 steels in Fig. 16.

The effect of carbon on the tensile properties and on the response to heat treatment has been discussed, now let us briefly consider how this can be applied to the selection of steel.

Steel Selection: In selecting an analysis for a particular application, it is advantageous to choose a lower carbon content because such a steel is easier to machine, to hot work (forge), to cold work, to weld and to manufacture (unless the carbon is below 0.15 per cent).

With reference to cold working medium or high-carbon steels, they can be annealed to produce what is known as a spheroidized structure instead of the pearlitic structure as illustrated in Fig. 1. The microstructure of spheroidized 0.30 and 0.95 per cent carbon steel is shown in Fig. 17. The change in tensile properties showing increased ductility (cold workability) of a 0.95 per cent carbon steel is shown in Table V.

The machinability of a 0.95 per cent carbon steel is also improved by spheroidizing, although, this is not necessarily true in the case of a steel containing 0.40 per cent carbon or less. A spheroidized structure, however, is much preferred for cold heading for carbon contents between 0.30-0.45 per cent carbon.

There are however, certain limitations to the choice of a low carbon steel, one is, that the hardness level specified is not always obtainable in a low carbon steel. Reference to Fig. 6 will make this clear, for the maximum hardness obtainable is governed by the carbon content, clearly a hardness range of 60 to 65 rockwell C could not be obtained with 0.30 per cent carbon steel.

Also the resistance to wear is improved by adding carbon in excess of about 0.85 per cent. Note, for example, the presence of a considerable number of hard carbide particles in microstrueture of NE-52100-A in Fig. 5.

Another reason for not choosing a lower carbon steel would be that water quenching to obtain high tensile properties might result in excessive distortion because of the severity of this quenching medium and complicated shape of the part.

The use of the case-hardening process which combines the advantages of the ease of fabrication of a low carbon steel with the advantages of the high surface hardness of a high carbon steel must not be overlooked.

Alloys Produce Higher Hardness

In the main, the use of alloying elements will not compensate for the proper carbon content.

Alloying elements will produce a higher hardness (tensile strength) than could otherwise be obtained by a plain carbon steel in the interior of larger sections. The choice of a particular alloy composition would depend on the section of the part, that is, a sufficient alloy content should be present to insure complete hardening to whatever depth of hardness is desired on quenching. The alloy content on the other hand, should not be greater than necessary to produce this condition, otherwise, the alloy content is wasted and danger of breakage in heat treating is increased.

There are naturally a great many other considerations such as, the advantage of using an alloy which lowers the critical range of the steel and therefore permits quenching from lower temperatures with lessened distortion, such as nickel; or the use of alloy combinations which give better machinability such as nickel-molybdenum steel; and the use of a chromium-molybdenum combination to increase wear resistance and strength at higher operating temperatures.

Renewed consideration is being given the study of residual stresses in hardened steel sections. It appears that certain alloy combinations do not give satisfactory operating service as well as presenting fabricating problems which cannot be explained on the basis of hardenability characteristics or tensile properties.

"Austempering" Developed

There have been occasions where normalized-and-tempered steels have given more satisfactory service than quenched-and-tempered steels regardless of the fact that they had considerable lower tensile properties. It can be readily deduced that in quenching of a large section, the surface of the section if quenched down to room temperature will have obtained a degree of rigidity greater than the center of such a section. It also can be remembered that during quenching through the critical range there are also volume changes; it is likely that definite cessations in the internal structure may occur. In fact the presence of microscopic cracks in quenched steel have been reported. This led to the development of a method of heat treatment known as "austempering" which allows the austenite transformation to take place at a constant temperature. By a study of S-curves and the application of principle of austempering, it may be found that the manganese-molybdenum steels can be heat treated to give satisfactory performance.

To conclude, we have endeavored to show by tensile test and microscopic data that in the selection of a steel for a particular application, the primary consideration is the choice of the proper carbon content. In doing so we have also discussed and presented data on the effect of other alloys with special reference to the NE (National Emergency) alloy combinations.

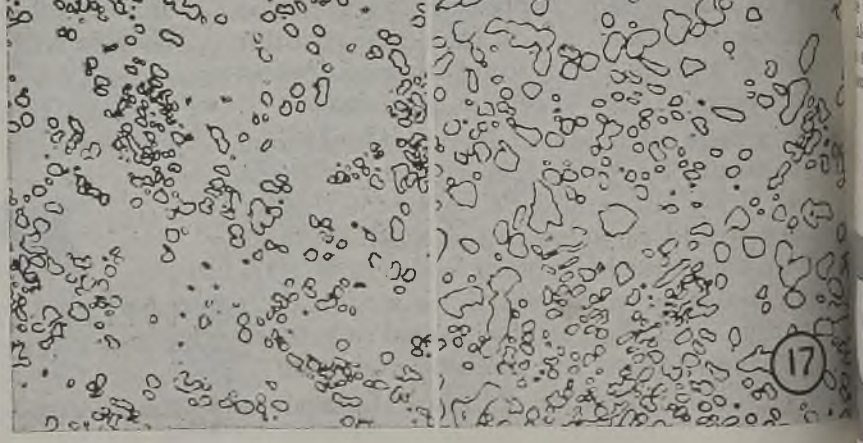

Fig. 17—Microstructure of spheroidized annealed carbon steels; etched in nital; shown at 1000 diameters

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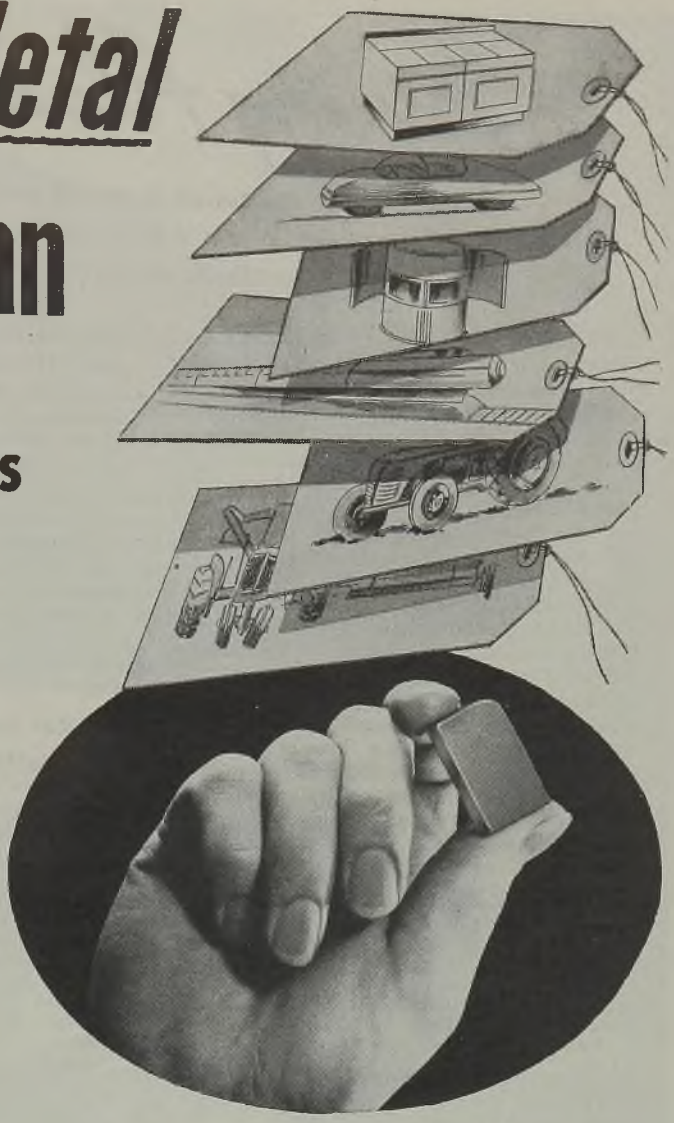

Starting as a metal powder, Carboloy Cemented Carbide is transformed, under heat and pressure, into an endless variety of shapes and forms—tool tips, dies and machine parts with the *super-hardness* that is vital to high-speed, low-cost industrial production.

IT TOOK a war production crisis to bring this magic metal into its own — to bring full appreciation of its value for metal-working tools and for "wear-proofing" parts.

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Joining Aluminum Alloys

Gas welding is discussed in second section of detailed report on fabrication of light alloys. Works well in joining sections from 0.025 to 1-inch thick. Other welding methods will be covered in next issue of STEEL

By E. C. HARTMANN, G. O. HOGLUND and H. A. MILLER

Aluminum Research Laboratories
Aluminum Co. of America
New Kensington, Pa.

ON THE BASIS of the definition that welding is a localized consolidation of metals, the aluminum alloys can be assembled by all of the commercial processes. All of the basic conceptions of welding—gas welding, arc welding, resistance welding, and brazing—have been developed in the form of commercial procedures for welding these alloys. The technique is essentially similar to that used for other metals, but, insofar as the metallurgy of welding aluminum is different, the procedures must be adjusted accordingly.

Special methods for welding heavy or thin sections and for mechanizing welding operations have not yet been completely worked out for these alloys. However, many new applications have developed during the war, particularly in the resistance welding and brazing fields, and much wider use of the welding processes is anticipated after the war.

A typical example is the fusion welding of aluminum without using a flux at speeds and soundness equal to or greater than can be obtained with present day commercial procedures. Permission to fully describe the technique cannot be obtained for the time being, although its feasibility has been demonstrated beyond question.

Gas Welding

The oldest welding process for assembling aluminum alloys is gas welding in which regulated mixtures of oxygen and hydrogen or oxygen and acety-

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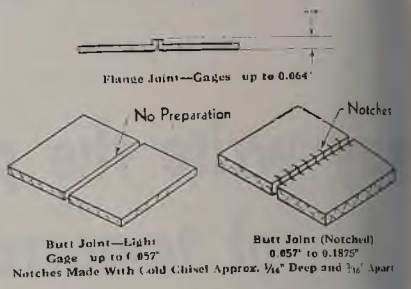


Fig. 7 (Above)—Preparation of butt joints for torch welds—thin gage material

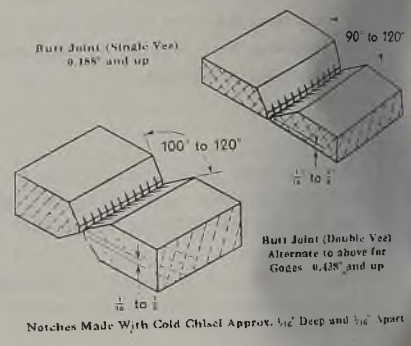


Fig. 8 (Above)—Preparation of butt joints for torch welds—thick gage material

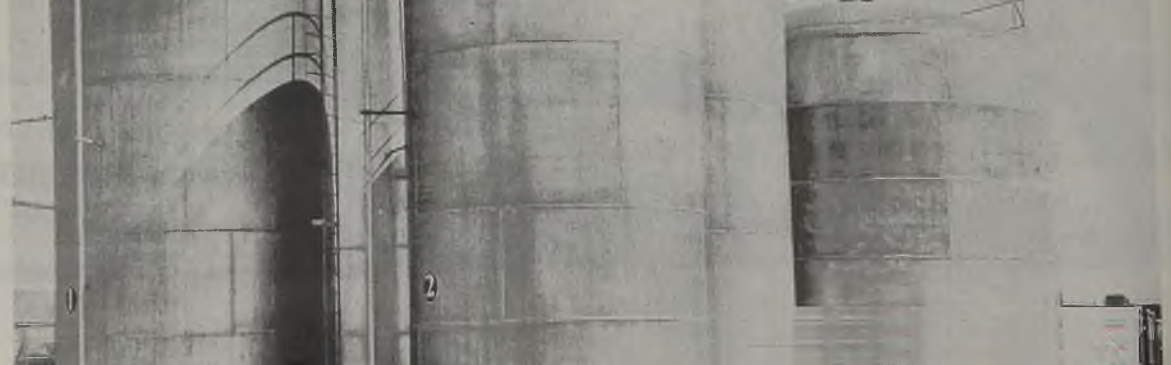
TABLE IV—APPROXIMATE SIZE OF TIPS AND RELATIVE GAS PRESSURES USED IN WELDING ALUMINUM OF VARIOUS THICKNESSES

Metal Thickness, B. & S. Gage	Oxyhydrogen: Diameter of Orifice in Tip, in.	Oxyhydrogen: Oxygen Pressure, psi	Oxyhydrogen: Hydrogen Pressure, psi	Oxyacetylene: Diameter of Orifice in Tip, in.	Oxyacetylene: Oxygen Pressure, psi	Oxyacetylene: Acetylene Pressure, psi
24-22	0.035	1	1	0.025	1	1
20-18	0.045	1	1	0.035	1	1
16-14	0.065	2	1	0.045	2	2
12-10	0.075	2	1	0.055	3	3
1/8-3/16	0.095	3	2	0.065	4	4
1/4	0.105	4	2	0.075	5	5
5/16	0.115	4	2	0.085	5	5
3/8	0.125	5	3	0.095	6	6
5/8	0.150	8	6	0.105	7	7

TABLE V—DATA FOR GAS WELDING TANK STRUCTURES

Thickness, in.	Gas Used	Diameter of Tip, in.	Wire Diameter, in.	Wire per 100 ft., lb.	Flux per 100 ft., lb.	Rate of Welding, ft./hr.
1/16	Oxyhydrogen	0.055	0.125	6.0	2.0	12.0
1/8	Oxyhydrogen	0.075	0.146	12.5	3.0	10.0
1/4	Oxyacetylene	0.075	0.184	20.0	5.5	8.0
3/8	Oxyacetylene	0.095	0.184	30.0	10.0	6.0
1/2	Oxyacetylene	0.095	0.250	35.0	15.0	3.5
5/8	Oxyacetylene	0.105	0.312	40.0	18.0	3.5

Fig. 9 (Below)—These three aluminum tanks for storing glacial acetic acid are each 15 feet in diameter and 30 feet high and were fabricated in the field by gas welding from 3S alloy. Each weighs 18,400 pounds



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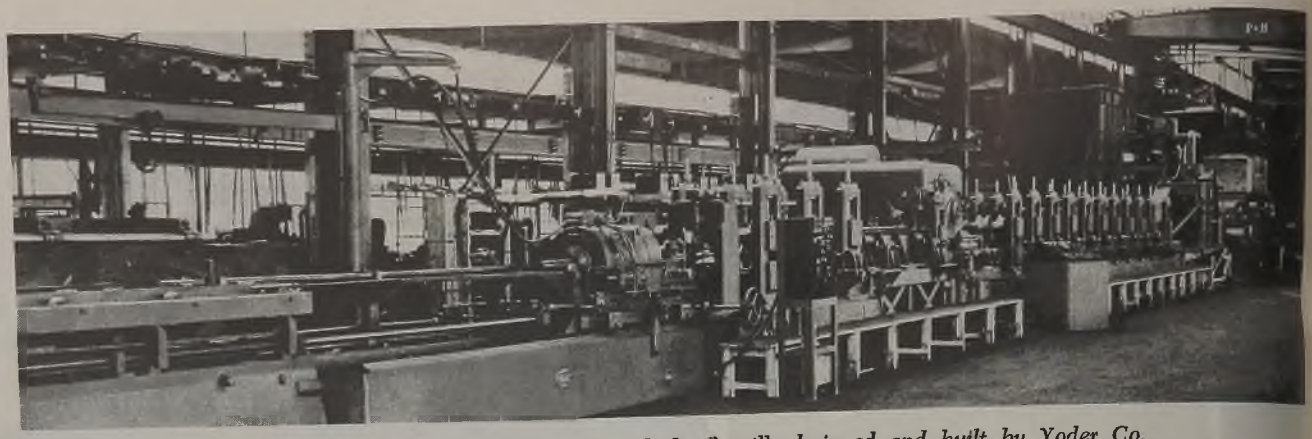

Fig. 1—Overall view of continuous "straight-line" mill, designed and built by Yoder Co. for Russian production of resistance welded steel tubing and pipe from coils of unpickled hot rolled stock. Runout table and revolving flying cutoff machine can be seen at left, continuous welding unit and general control desk at center, and shot blast unit at far right

Tube Mills for RUSSIA

convert coils of unpickled hot rolled steel strip into finished products of desired length, by continuous "straight-line" action

TWO complete mills for the production of 1½ to 6-inch resistance welded steel pipe, each of which makes a production unit about a quarter of a mile long, have just been completed by the Yoder Co., Cleveland, for Russia, involving erection of each entire mill and its operation as an assembled unit in the Yoder plant before shipment.

While it is common practice to set up and test-run every individual machine in building this type of equipment, this is believed to be the first time that so complete an assembly of a pipe mill of such size has ever been made anywhere except at the point of ultimate use. It has afforded an unusual opportunity for representative groups of officials and technical men from the steel and tube and tube products industries to inspect first hand the latest type of high-production welded pipe making equipment. The first of the mills, which are identical twins, already has been viewed, torn down and shipped. This is shown in Fig. 1, as set up for operation at the Yoder plant. The second is currently being assembled.

Among the new features is the 750-kilovolt ampere alternating-current welder, with an ingeniously mounted close-coupled electrode and transformer assembly. A close-up of this unit, as installed in the production line, is presented in Fig. 2. Wheel-type electrodes are mounted directly to the transformer, which revolves with them. Unusually short travel of welding current is achieved. The welder is compactly assembled, affords ready access to the guide roll and electrode adjustments and the electrode dressing tool, which provide for convenient adaptation of the machine to the various pipe size within the range of the mill. The electrode dressing unit just mentioned, can be seen just below the nameplate in Fig. 2.

Individual machines which make up the complete mill are: A heavy-

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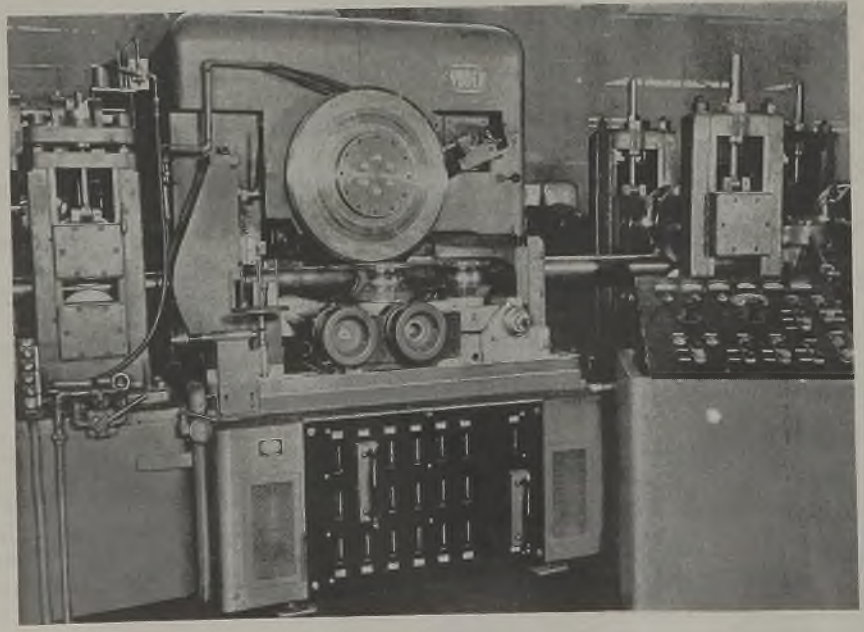

Fig. 2—The heart of the machine is this resistance welding unit, with its twin wheel electrodes mounted directly on the transformer. Just below the nameplate is a device for dressing the electrodes by means of a turning tool. To the right is a centralized electrical control desk. Once the mill is rolling the chief operator has full command from this station

Close Limits and Fine Finish -

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Close limits and a fine finish are essential for efficient production on many important metal working operations. Maximum output at minimum cost can be attained only when the methods and machines are such that close tolerances and the best possible finish can be maintained on piece after piece, indefinitely.

It is on this type of work—exacting toolroom jobs or production operations that call for toolroom accuracy—that the high precision and dependable performance of South Bend Lathes pay real dividends. Their smooth operation through a wide range of spindle speeds produces surprisingly fine finishes. In fact, when South Bend Lathes are installed, subsequent finishing operations can often be eliminated.

Today South Bend Lathes are better in every way. Our entire plant is devoted to lathe production—we manufacture no other products. There has been no lowering of standards because of war-time restrictions or shortages and the use of substitute materials is negligible, limited to non-essential parts such as name plates, paint, etc. Improvements have been accelerated to meet war production needs.

South Bend Engine Lathes and Toolroom Lathes are made in five sizes: 9″, 10″, 13″, 14½″, and 16″ swing. Precision Turret Lathes are available in two sizes: Series 900 having 9″ swing with ½″ collet capacity, and Series 1000 having 10″ swing with 1″ collet capacity. Write for Catalog No. 100-C.

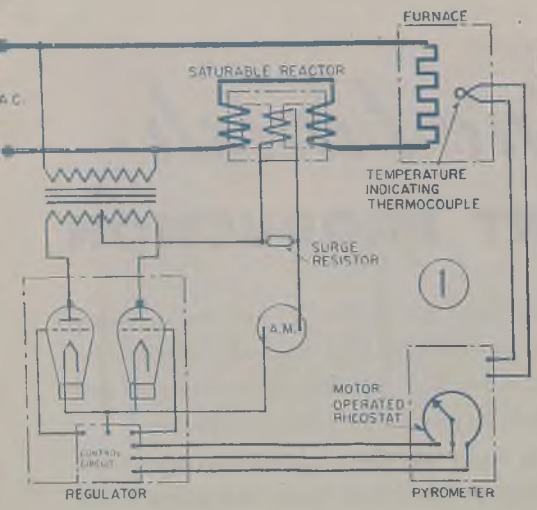
BUY WAR BONDS NOW . . . SAVE FOR LATHES

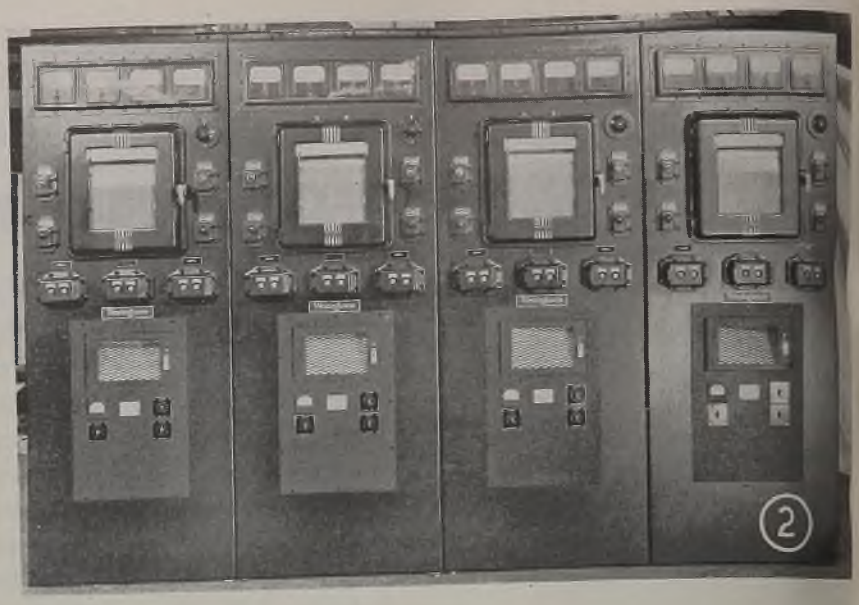
SOUTH BEND LATHE WORKS

LATHE BUILDERS FOR 37 YEARS • SOUTH BEND 22, INDIANA

POST-WAR PRIORITY PLAN

To those who cannot qualify for a war-time priority, South Bend Lathe Works offers a practical Post-War Priority Plan. You can place your order now for any South Bend Lathe. No deposit or down payment is required. We ask only that the order be placed in good faith. When civilian production is resumed, orders will be filled in the sequence established by the numbers of the Post-War Priority Certificates. Should conditions necessitate, the order may be cancelled at any time. Write now for details of this plan.

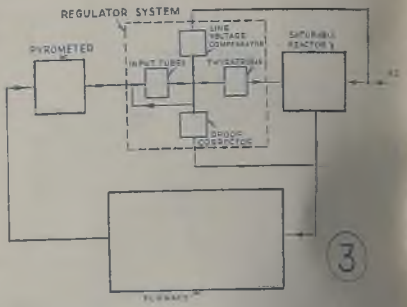


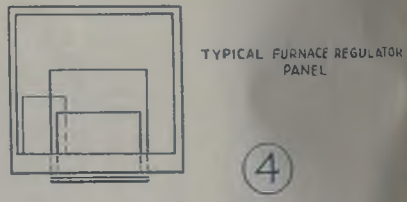


Electronic Control for RESISTANCE FURNACES

Latest method developed for accurately controlling temperatures of heat-treating and other furnaces involves simple regulator system

By HAROLD J. HAGUE
Electronic Engineer
Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.





THE NEED for accurate control of temperature in resistance-heater furnaces has made it necessary to devise better means for obtaining this accuracy of control.

The latest method involves a comparatively simple and inexpensive arrangement of: (1) saturable core reactor, (2) an electronic regulator, (3) pyrometer with motor-operated rheostat of slide wire construction. For simplicity, in this article the complete resistance-furnace temperature control will be called a regulator system and the electronic regulator will be referred to as a regulator.

The regulator system regulates the temperature of resistance-heated furnaces and maintains this temperature at a constant value. It can be used to control either a single or three phase furnace and the resistors or heating elements of the furnace may be connected either in delta or wye when supplied from a 3-phase line.

Larger furnaces having several heating zones—separate systems of heating resistors—can be controlled by one regulator system or by individual zones. The choice depends entirely upon (1) the engineer designing the furnace, (2) the overall accuracy required and (3) the design of the saturable core reactors.

Applications: The regulator system works well in cases where temperature control of heating-chamber exit gas is important. A typical chamber of this nature, with a corrosion-resistant lining, is used in the production of synthetic rubber. The gas enters the chamber through an input pipe and leaves through an exit pipe. In the chamber the gas is heated to the desired temperature; from there it goes to a remote location. The temperature of the chamber is of little importance but the exit-gas temperature must be accurately controlled. The regulator system does this job very well through use of thermocouples lo-

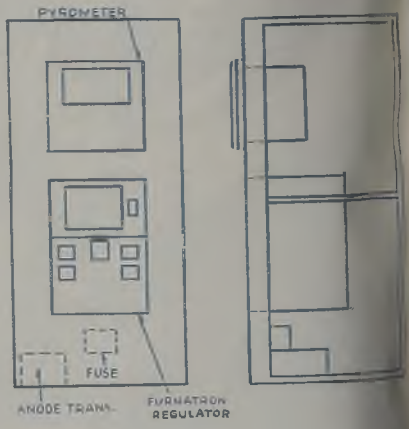


Fig. 1—Line diagram of a furnace regulator system. The alternating-current line is fed into the saturable core reactors and hence to the heater elements. Voltage for operation of the regulator is also taken from this line as is the anode voltage for the thyratron tubes. A thermocouple is placed in the furnace and terminated in a pyrometer, which is connected with the regulator

Fig. 2—Bank of Furnatron temperature regulating systems. Regulator proper occupies lower half of panel and is vapor tight. Push buttons, pilot lights and contactors are explosion proof; pyrometers semi-vapor tight

Fig 3—Line diagram showing arrangement of a furnace regulator system with droop-corrector and line voltage compensator

Fig. 4—Typical regulator panel assembly—one is required for each zone

Why Blue Flash Mounted Wheels and Points Pay Off in Greenbacks

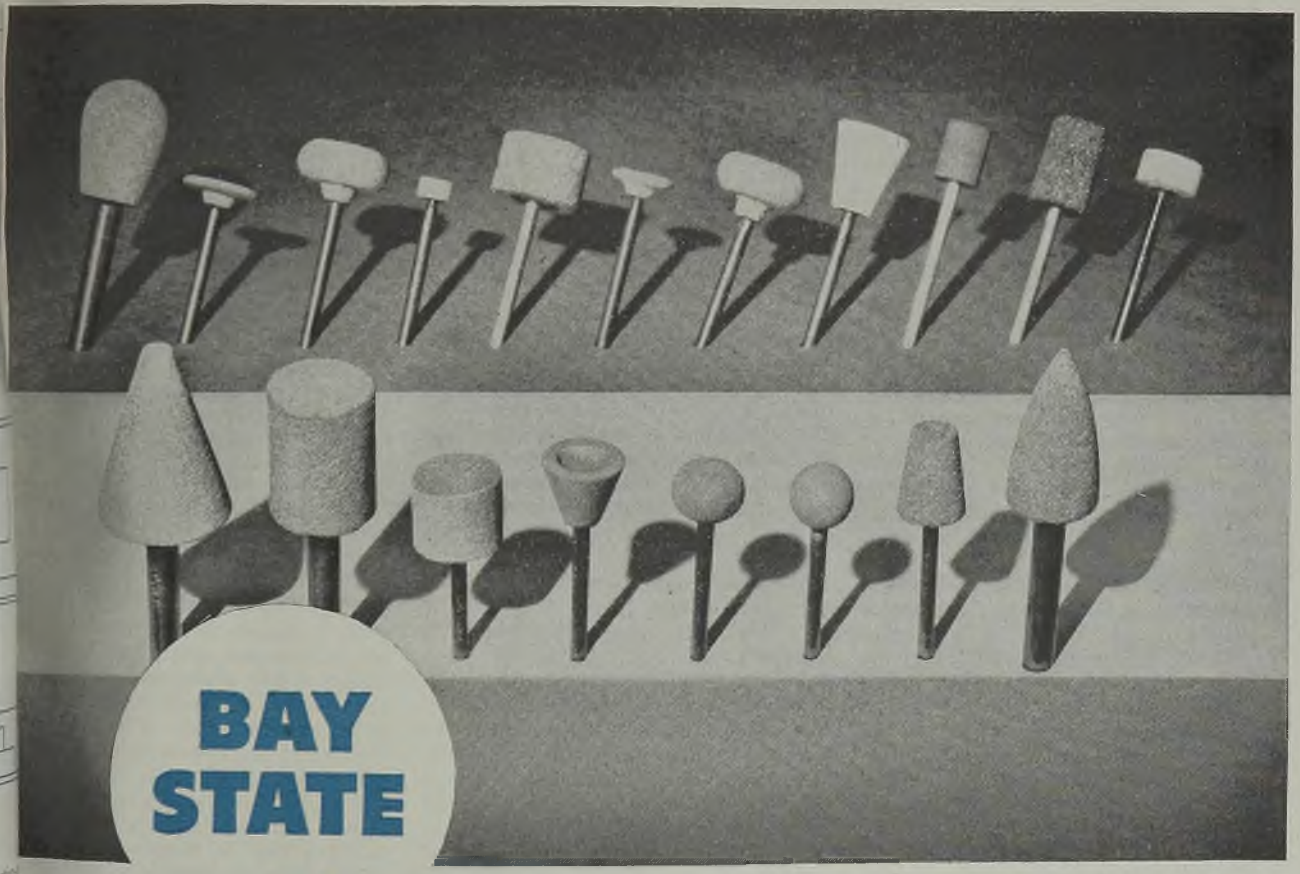
Blue Flash mounted wheels and points are ready for immediate cutting action as soon as you receive them. There is no wasteful "breaking in" period. What's more, they are free from hard and soft spots.

These unique features are the result of Bay State's special manufacturing process . . . Blue Flash mounted wheels and points are first made into uniform blanks (rather than pressed into shape form) . . . then, after mounting on mandrels, their grinding surfaces are trued to size and shape. The result . . . sharp, smooth-running, more efficient wheels that pay off in greenbacks, because they save valuable time and do more work for the money.

Extra advantages like these will be found throughout the entire line of Blue Flash products . . . advantages that have earned Bay State a position of leadership for quality . . . the finest honing and superfinishing stones ever manufactured . . . portable snagging wheels with extra safety features . . . precision grinding wheels in fractional grades, etc.

Check complete details on how Blue Flash Mounted Wheels and Points "pay off in greenbacks". Send for pocket-size catalog D.

BAY STATE ABRASIVE PRODUCTS CO.
WESTBORO, MASS.



BLUE FLASH GRINDING WHEELS *FAST and COOL*

GRINDING WHEELS · HONING AND SUPERFINISHING STONES · PORTABLE SNAGGING WHEELS

MOUNTED WHEELS AND POINTS · CUT-OFF WHEELS · INSERTED-NUT DISCS · AND CYLINDERS

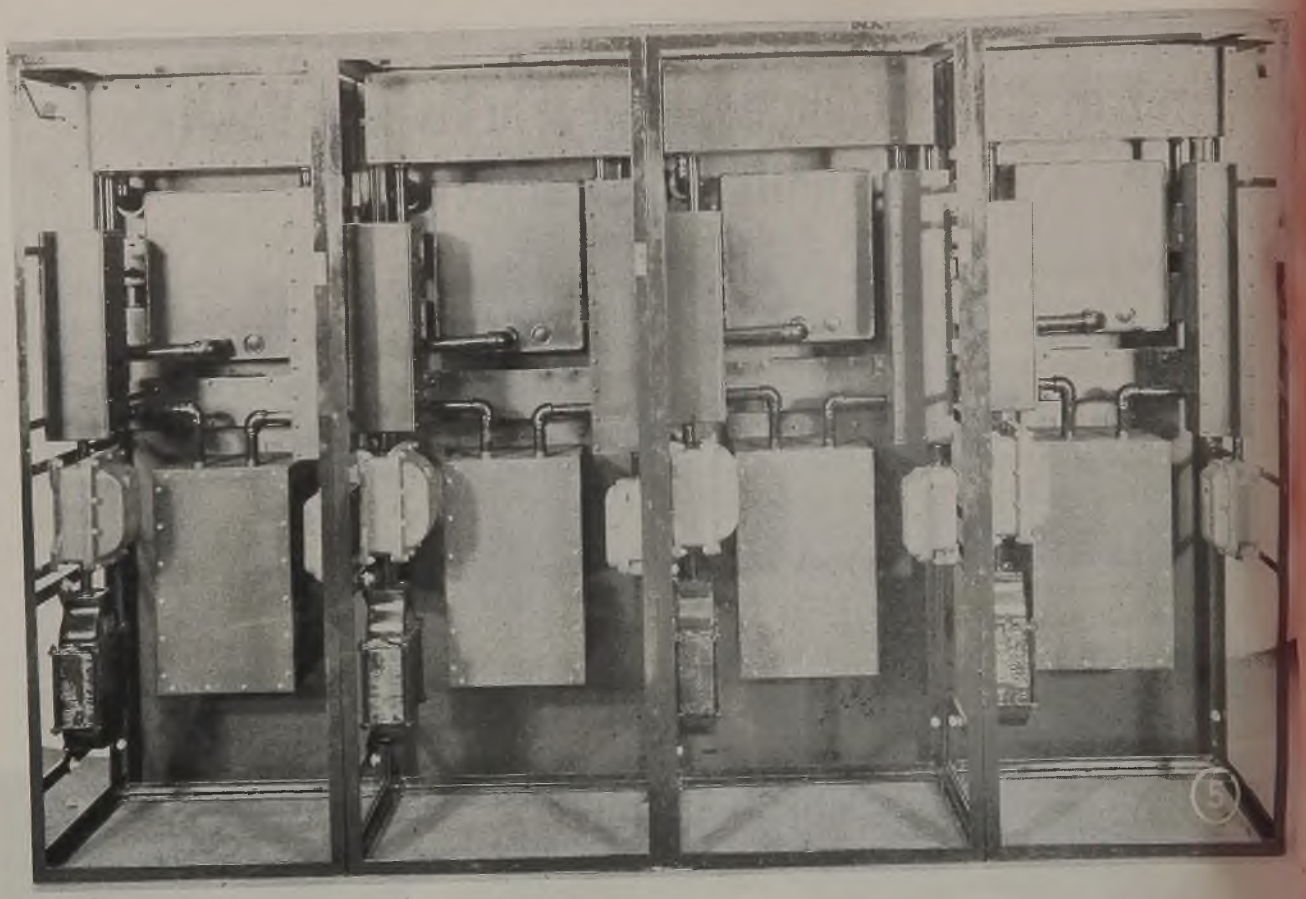


Fig. 5—Rear view of panels for a typical Furnatron regulating system installation

cated in the exit pipe. Thus there are numerous applications for the control in both chemical and metalworking industries.

The regulator system may be used on furnaces that are charged and held at some desired heat level for several hours or days. This may be a heat-treating or soaking process or may be a furnace carrying a varying load—it may be a case where constant temperature is required for only a short time—it may involve a bake oven for drying insulating material on various pieces of equipment. Equipment and insulating material are damaged by temperatures that are too low or too high; likewise, fluctuations in temperature seriously affect the quality of the insulation. Ammonia manufacturers, synthetic rubber manufacturers, the chemical industry and the heat treating industry have many uses for the regulator.

A line diagram of a regulator system is shown in Fig. 1. The alternating-current line is fed into the saturable core reactors and hence to the heater elements of the furnace. The voltage necessary for operation of the regulator is also taken from this alternating-current line as is the anode voltage for the thyratron tubes. A thermocouple is placed in a strategic position in the furnace and the output of this thermocouple is terminated in a pyrometer (as shown in Fig. 1). A motor in the pyrometer operates a sliding resistance contact whose position corresponds to the furnace temperature as indicated by the thermocouple. In some cases it is desirable to use the pyrometer for monitoring the temperature at a point other than the heat center (usual location of the thermocouple) in the furnace. This can be very conveniently arranged by placing a toggle or rotary selector switch in the pyrometer, and by operating the selector switch it is very easy to select the desired location in the furnace. Since all thermocouples are connected to the pyrometer, any one thermocouple can be used as the control thermocouple.

Includes Five Components

The temperature control circuit of the regulator includes:

1—The slide wire potentiometer in the pyrometer.

2—The position adjustment potentiometer in the regulator used to select the average furnace temperature to be maintained by the regulator system. After the position control is set and the furnace reaches the predetermined temperature, any change in the furnace temperature will result in an unbalanced condition in this circuit and will result in the control tube advancing or retarding the firing angle of the thyratron tubes in the regulator. By changing the firing angle of the thyratrons, the direct-current output of the regulator is controlled.

3—Width or sensitivity adjustment potentiometer in the regulator used to regulate the width of the control zone. Movement of the pyrometer slide wire (within its zone) will cause a large change in the direct-current output voltage of the regulator if the width adjustment is set for high sensitivity; it will cause a small change if set for low sensitivity. The total width of the control zone corresponds to the total range of the direct-current output voltage, in other words—from zero to maximum.

4—Maximum adjustment potentiometer—in the regulator used to control the upper limit of the furnace. By a slight modification of the regulator the maximum adjustment can be used for manual control.

5—Droop corrector potentiometer adjustment which is used to determine the amount of droop correction that should be added to the existing output of the regulator.

A droop-corrector is usually required when a furnace is loaded continuously but at a varying rate, or when the conditions of heat dissipation are subject to change. It is designed to compensate for additional loss or gain of heat due to an increase or decrease in the heat dissipation of the furnace.

The droop-corrector responds to load voltage and functions when this voltage increases due to temperature drop resulting from an increase in the furnace load. A result of the action of the pyrometer controler, the droop-corrector will tend to increase the load voltage and thus compensate for temperature drop under steady state conditions. Without the droop-corrector, when the rate of material flow is increased, the furnace temperature will be stabilized at a slightly lower level than it was before. This is true even though load voltage and power are increased by the regulator, and

(*Please turn to Page* 162)

HOW TO SOLVE *Lubrication Problems*

The First All-Purpose Grease for Plain Bearings!

COMBINES BEST FEATURES OF BOTH LIME AND SODA BASE GREASES...
NEW, UNIQUE, PATENTED PRODUCT

STANDS TEMPS. FROM FREEZING TO 350° F.!

STANDS LIGHT TO HEAVY PRESSURES!

STANDS WASHING EVEN BY BOILING WATER!

ALL METHODS OF APPLICATION!

HERE'S THE ALL-PURPOSE GREASE you've been looking for, if you're operating a plant where it's to your advantage to use just one grease.

This great Socony-Vacuum development meets the needs of all plain bearing lubrication as indicated above. It's also suitable for numerous ball and roller bearing applications.

The reason: Gargoyle Grease Sovarex combines the advantages of both lime and soda-base greases. It is resistant to both water and heat and stands up under boiling water. It also resists dilute alkali and acid solutions. It sticks on the job when other greases fail.

See your Socony-Vacuum representative for details on Gargoyle Grease Sovarex.

WHERE PLANTS BENEFIT BY USING ONE GREASE!

GARGOYLE
Lubricants

SOCONY-VACUUM OIL CO., INC. • Standard Oil of N.Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. • White Eagle Div. • Wadhams Div. • Magnolia Petroleum Co. • General Petroleum Corp. of California.

RGOYLE GREASE SOVAREX

HOW TO SOLVE *Cutting Oil Problems*

YOU CAN, TOO!... Many operators measure cutting tool life by the number of pieces produced between grinds. This is misleading. It's only the *apparent* tool life.

Real tool life is measured by the number of pieces turned out before the tool is scrapped!

It depends not only on the number of grinds but also on the amount of metal removed each time. In selecting cutting oils, remember this difference.

With different oils, the APPARENT tool life may be identical—but a wide variance may exist in the TOTAL tool life!

Case histories on threading operations (as above) show as much as 12/1000 of an inch removed at each grinding. With S/V Sultran and S/V Vacsul Cutting Oils, the metal removed has been reduced to as little as 2/1000 of an inch.

The reason: S/V Sultran and S/V Vacsul Cutting Oils provide maximum lubricity to prevent excessive wear in the boundary areas. They also have high anti-weld properties to keep the built-up edge flowing with the chip, and high-pressure resistance to reduce tool wear in the extreme pressure areas.

GARGOYLE Lubricants

SOCONY-VACUUM

OIL COMPANY, INCORPORATED

HOW TO SOLVE *Rust Preventive Problems*

Check This Chart for Your Rust Preventive

THIS COMPLETE LINE OF S/V SOVA-KOTES INCLUDES PRODUCTS TO MEET YOUR SPECIFIC REQUIREMENTS

BRAND	EXPOSURE			WRAPPING				HANDLING		APPLICATION				TYPE OF FILM						LUBRICATING VALUE		
	INDOORS AND OUTDOORS PROTECTED	OUTDOORS UNPROTECTED	ACID FUMES	NONE	PAPER	BURLAP	BOX OR CRATE	LIGHT	ROUGH	COLD	BRUSH OR SWAB	DIP	SPRAY	TRANSPARENT	SEMI-TRANSPARENT TO OPAQUE	FIRM OR HARD	MODERATELY SOFT	SOFT	SOFT AND OILY	GOOD	FAIR	EASY REMOVAL WITH KEROSENE
S/V SOVA-KOTE 101 (very soft)	x			x	x	x	x	x	x	x	x	Hot	Hot		x			x		x		x
S/V SOVA-KOTE 102 (medium soft)	x	x	x	x	x	x	x	x	x	x	x	Hot	Hot		x			x		x		x
S/V SOVA-KOTE 201 (liquid)	x			x	x	x	x	x		x	x	x	x	x			x			x		x
S/V SOVA-KOTE 202 (liquid)	x			x	x	x	x	x		x	x	x	x	x			x				x	x
S/V SOVA-KOTE 301 (liquid)	x			x	x	x	x	x		x	x	x	x	x					x		x	x
S/V SOVA-KOTE 302 (very soft)	x	x		x	x	x	x	x	x	x	x	Hot	Hot		x				x	x		x
S/V SOVA-KOTE 401 (liquid)	x			x	x	x	x	x		x	x	x	x	x					x	x		x
S/V SOVA-KOTE 402 (medium stiff)	x	x		x	x	x	x	x	x	x	x	Hot	Hot		x				x	x		x
S/V SOVA-KOTE 601 (liquid)	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x						
S/V SOVA-KOTE 602 (liquid)	x			x	x	x	x	x		x	x	x	x	x					x	x		x

HERE'S THE WAY the chart works: Lay the edge of a piece of paper on the double line under the vertical columns that show the type of exposure, wrapping, handling, application, film desired, etc. Check your individual requirements under each division with a small mark on the paper, and then move the paper straight down until your check marks and the check marks on the chart correspond.

You'll find the ten S/V Sova-Kotes listed cover virtually every requirement of industry. It may be, however, that you have a new and unusual need not included. If so, your local Socony-Vacuum representative—backed by our research laboratories—will welcome the opportunity to help you solve your problem.

GARGOYLE Lubricants

BACKED BY 78 YEARS' EXPERIENCE IN MAKING PETROLEUM PRODUCTS

New Industrial Oils Ready Now

Socony-Vacuum Researchers Push Product Development during the War for Amazing Advances in Circulating and Turbine Oils, Cutting and Quenching Oils,

SAYS O. L. BENJAMIN

Industrial Manager, Chicago Division, Socony-Vacuum Oil Co., Inc.

BECAUSE of the nature of its business, Socony-Vacuum did not need to convert to become a war industry. When war production ceases, we will not have to reconvert to get back on a peacetime basis.

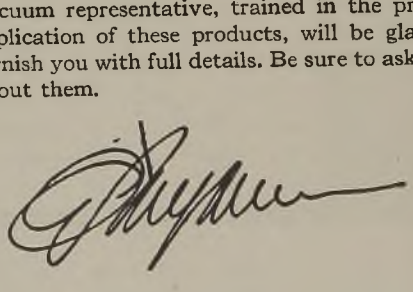
For this reason, our research laboratories have been able to continue without let-down their far-reaching product-planning and development program—to improve present Gargoyle lubricants and S/V cutting oils and perfect new products.

Many new discoveries already made available to you have been proved in severe wartime service. Others, just as advanced, await only the release of critical materials necessary for their manufacture.

Most significant of the new products now on the market are new Gargoyle Vacuoline Oils for close clearance grinder spindles and new Gargoyle D.T.E. Turbine Oils that have proved far superior to other oils in the severest tests yet contrived.

Other wartime developments include new transparent Sultran cutting oils with high lubricity and anti-weld characteristics, and new, faster S/V Quenchols to help you meet demands for increased hardness tolerances.

These are just a few of the new products that we can give you right now. Your local Socony-Vacuum representative, trained in the proper application of these products, will be glad to furnish you with full details. Be sure to ask him about them.



This is one of a series of messages prepared by Socony-Vacuum Industrial Managers

GARGOYLE Lubricants

SOCONY-VACUUM OIL CO., INC.

Standard Oil of N. Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. White Eagle Div. • Wadhams Div. Magnolia Petroleum Co. • General Petroleum Corporation of California.

PEROLINE and DEOXIDINE

• • • *Eliminate Rust Bottlenecks* • • •

Humid, rainy summer months are rust months and play havoc with metal production. Vital supplies of war materials are delayed—at times stopped.

Rust bottlenecks no longer need occur to hamper production. Peroline and Deoxidine will eradicate and prevent rust, making these stoppages or delays unnecessary either in rainy seasons or at other times.

Peroline (a combined chemical and oil) not only effectively retards corrosion on steel components in processing, in storage and in transit, but—it dissolves blushes of rust, eliminating the labor of a separate cleaning operation. There is a grade of Peroline for application to wet surfaces as well as grades for application to dry metal. Peroline is unique in its ability to clean and, when the oil phase is removed with degreasing solvents, to leave the surface properly conditioned for painting.

Surface Badly Rusted. If in processing, surfaces have become badly rusted, Deoxidine provides a fast and easy means for removing and eradicating rust and rust stimulators, leaving a surface properly prepared for painting.

If you are experiencing rust troubles, the ACP technical department will gladly consult with you and recommend the method best suited to correct and prevent future rust annoyance.

Write for Technical Service Data Sheets.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP PENNA.

Note: West Coast Plants may address inquiries and orders for prompt delivery to: Leon Finch, Ltd., 728 East 59th St., Los Angeles, Calif.

CHEMICALS ACP PROCESSES

American Chemical Paint Company, Ambler, Pa.
Please send me general Technical Service Data Sheets on
☐ Peroline ☐ Deoxidine

*Name*_____ *Title*_____

*Company*_____

*Address*_____

F-7

ALIEN PATENTS

Available to Industry

STEEL is presenting a list of enemy patents of interest to the metalworking industries. Many of these are available on a nonexclusive royalty-free basis under simple licensing terms. Copies of any patents listed may be obtained by addressing the Commissioner of Patents, United States Patent Office, Washington 25. Include 10 cents for each patent, specifying serial number.

These patents are classified by types of operation, such as metal founding, metalworking, metal rolling, metal bending, metallurgy, metal treatment, metal forging and welding and the like. Included are enemy patents, patents pending and patents in enemy-occupied countries.

CLASS NO. 153—METAL BENDING

LIST OF ENEMY PATENTS

DESCRIPTION	PATENT NO.
Device for the manufacture of separable fasteners	1889803
Device for automatically arranging the elements of sliding clasp fasteners	1890300
Apparatus and method for applying strips of solder to sheet metal	1948379
Device for the manufacture of sliding clasp fastenings	2017814
Method and apparatus for manufacturing packing	2031567
Fixing device for sliding clasp fasteners	2066359
Fastener attaching machine	2087461
Apparatus for the manufacture of zip fasteners	2094715
Apparatus for attaching slide fastener locking members to flexible tapes	2203448
Device for supplying fastener elements	2217121
Device for producing sliding clasp fasteners	2240018
Process and machine for manufacturing tubes	1941953
Machine for the manufacture of shells for metal cups and similar articles	1954332
Method and apparatus for the manufacture of electrical contact plugs	2004555
Method for the hot straightening of plates	2071596
Mechanism for producing curved metal articles	2251741
Method of producing arched metal panels	2095533
Method and device for mechanically attaching pins to fly catcher tapes	1981732
Machine for flanging sheet metal plates	1990255
Bending machine	2055955
Universal machine for canting and circular bending	1944651
Universal flanging and bending machine	2025222
Bending machine	1837196
Automatic matching and doubling machine	1724715
Stamping tool for keys	1734881
Apparatus for the production of section iron with box shaped cross sections	1779185
Device for use in forming undercut sections of rolled metal	1826813
Means for flanging the edge of a round opening	2193050
Apparatus for producing bent pipes of correct prescribed lengths	1781567
Means for setting type levers	1783177
Apparatus for straightening out the ends of bent pipes	1857583
Process for manufacturing bent pipes	1888891
Machine for the manufacture of sheet metal tubes and other tubular members.	1915257
Method and apparatus for manufacturing pipe bends and the like	1951334
Method and apparatus for straightening plates	1723098
Device for bending rails, pipes and the like	1707991
Gripping device for bending machines	1644555
Bending machine for rod and profile iron	1795188
Pipe bending machine	1847200
Pipe bending machine	1919839
Method of and means for bending iron bars	2231306
Pipe bending machine	1600339
Bending machine	1903799
Device for bending metal bars	1933363
Machine for producing tubular bends and coils and for expanding tubes	1648161
Die press	2123683
Draw press	2129774
Stretching press	2245723
Drawing machine for metal sheets	2269549
Device for manufacturing arch supports	1830647
Device for cambering spring leaves	1851884
Method of and means for rendering metal bands supple	1584499
Rolling machine	1624448
Straightening machine provided with rolls	1716362
Method of and apparatus for making metal tubes	1800023
Straightening and rolling machine	1856937
Device for bending toy rails	1857325
Adjusting device for plate straightening machines	1905530
Roller straightening machine	1943153
Device for straightening plates, wires and the like	2018400
Plate straightening machine	2049142
Straightening machine	2185481
Straightening machine	2213507
Means for effecting rotary operations, operations in step presses	1784745
Machine for the manufacture of curled bendings at the longitudinal edges of metallic strips	1841758
Method of making pipe bends	1604489
Manufacture of pipe bends	1617277
Process and apparatus for making helical tension springs having particularly great preliminary tension	224844(
Apparatus for producing endless extended coil structure	2209114
Device for winding cylindrical wire springs	1604172
Spring coiling tool	1671983
Process of and apparatus for manufacturing helics	2164679
Corrugated sheet metal shape	1704326
Apparatus for making water drums of water tube boilers	1898070
Apparatus for making headers for water tube boilers	1931242
Machine for manufacturing flexible metal pipes	1605194
Apparatus for rolling sheet metal	1899225
Twisting reinforcements for concrete	2216758
Means for expanding hollow bodies	2088131
Tube expander	1752408
Tube expander	1793624
Controlling means for plunger pumps	1794575
Apparatus for arranging the fastener members of sliding clasp fasteners in rows	2003146
Hand press	2006889
Method of and apparatus for flanging containers	1753983
Process and apparatus for manufacturing anatomically accurate individual foot supports for shoes	1826783
Device for bending iron rods	1688099
Apparatus for straightening hot plates	2144783
Tube finishing or straightening rolling mill	1791889
Process and apparatus for increasing the strength of articles	1628234
Method of making sinuous bulges on pipes	2012763
Tube beader	1621128
Tube expander	1670268

LIST OF PATENTS FROM ENEMY-OCCUPIED COUNTRIES

Machine for manufacturing zip fasteners	2023648
Device for the manufacture of zippers	2297436
Machine for making closures	2196618
Apparatus for working sheet metal	2301643
Method of making pipe bends	1975045
Apparatus and method for bending pipes, bars, plates and like pieces	2206888
Device for shaping pieces	2292736
Machine for bending metal tubes in the cold state	1863683
Nail and like straightening device	1639289
Tool for making cartridge shells	2003458

(*Please turn to Page* 172)