STEEL

The Magazine of Metalworking and Metalproducing

SEPTEMBER 4, 1944

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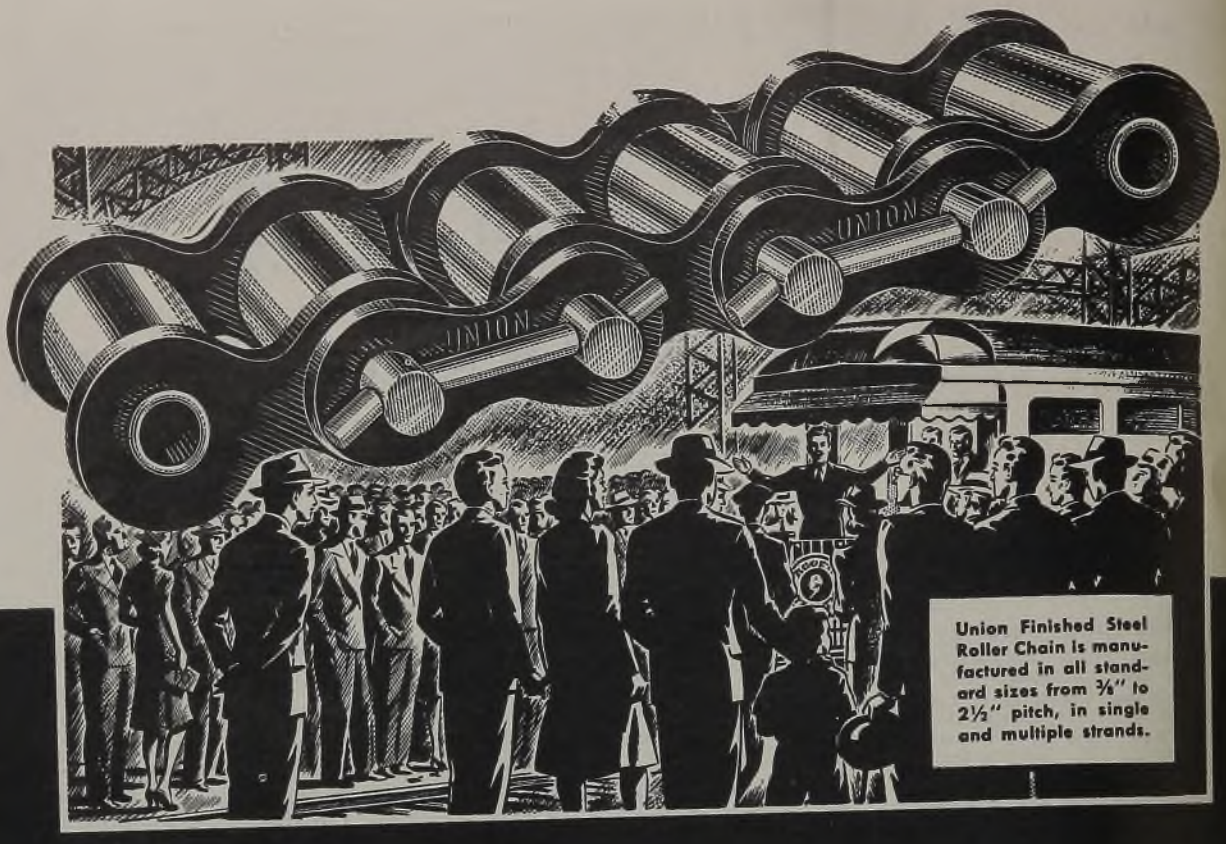
NEWS

TECHNICAL

FEATURES

MARKETS



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UNION CHAINS

STEEL
September 4, 1944

Enough and On Time

This is written on the eve of the fifth anniversary of the outbreak of World War II. At this moment the forces of the Allied Nations are advancing on all fronts. In Europe the enemy is reeling back toward the homeland in rapid retreat. In the Pacific the enemy faces certain defeat.

With ultimate victory now so definitely assured, it may be well to remind ourselves of some of the major factors which have contributed to our present encouraging position. Why have we been able to win superiority over our enemies so quickly notwithstanding their tremendous head start?

First in line to deserve credit are the armed forces. From the chiefs of staff down through the ranks of fighting men in all of the services the performance has been excellent. The campaigns have been well planned and the field officers and men have conducted them effectively. This has been true of combat in the air and on land and sea. Particularly gratifying has been the unprecedented teamwork between the services under our flag and between our forces and those of our Allies. It would be impossible to overstate the credit that is due our fighting men.

Next in line for credit, in our opinion, is American industry. We predict that when historians record the achievements of this war in studied retrospect, they will point out that the contributions of the American "arsenal of democracy" played a major role.

Whereas in World War I our expeditionary forces fought largely with equipment supplied by the British and French, in the present contest our men are superbly equipped with American equipment infinitely superior to anything used in any previous war. In addition to supplying our own forces, we have provided vast quantities of weapons and equipment for our Allies.

The ingenuity, skill and "know how" of American manufacturing also scored heavily. The sheer ability of the Allies to land, equip and supply millions of soldiers in France without the early use of a major seaport is proof positive of this American resourcefulness.

American industry has produced enough and on time and will continue to do so to the end. We need to remember this at a time when trouble at the top in WPB and in government policies affecting war production is being aired in the public prints. In spite of difficulties in government and in industry, the overall job has been exceedingly well done.

TOMORROW'S STEELS: Favorite current topics for discussion among metallurgists are the future status of the NE steels and the extent to which the movement to judge steels by ability to perform rather than by the chemical and physical characteristics of test bars will gain favor among steel users.

Automobile metallurgists believe that some of the NE steels will be used extensively during the postwar period. However, cost will be a factor. Extras now carried by certain NE steels, if continued into a period of intense competition, may handicap the use of the war-born steels. Price adjustments, which will become inevitable as the law of supply and demand emerges as a factor in pricing, will tend to erase some of the inequalities.

As for the basis of selecting the right steel for the right use, the war period experience probably will accentuate the trend away from chemical analyses and test bar evidence. Metallurgists and

(OVER)

specifiers of the more exacting steels are much more conscious of the problem than are the great number of users of ordinary steels.

The editors of this publication have queried thousands of steel users on these and other questions of current interest. We will present significant returns in one of our October issues. —p. 69

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PRICES TO THE FORE: Although this nation has progressed far on the path of a planned economy, it has not gone far enough to get away from the influence of the old law of supply and demand.

This is evident from the present situation in iron and steel scrap. Anticipating an early end of the European war and desiring to reduce inventories, many steel companies are out of the market. As a result, some grades of scrap are moving at below ceiling prices.

Scrap markets are extremely sensitive. The weakness in this commodity probably is prophetic of price fluctuations which may be expected in many other lines as the end of the war nears. With some prices pegged and others free, the entire economic system is in for an experience that will be new to buyers and sellers. This is one reason why we soon will need to be more price conscious than we have been for several years. —pp. 49, 52

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WHO CAN PROMISE? Reports from the West Coast indicate that the number of employes in war plants in the San Francisco Bay area who are quitting their jobs and returning to their homes in the central and eastern states now is running between 4000 and 6000 per month. Outmigration on this scale threatens war production seriously.

Regional officials of WMC and local Labor Management Committees are trying to retard the exodus of war workers by promises of job security in the bay area after the war is ended. Granting that these promises are made in the best of good faith, we doubt whether they will impress many of the workers sufficiently to induce them to remain on the job.

The reason is that practically every government agency has changed its mind so frequently that the average citizen has been forced to conclude that the word of a government agency in most cases is meaningless. This is unfortunate, but true.

—p. 56

CUTTING UNDER WATER: Extremely gratifying is the progress being made in improving methods of fabricating steel plate. Many short cuts have been developed in cutting and joining plates for ship assemblies. A new technique for water quenching alloy steel plate for armament has been perfected since the time of Pearl Harbor.

In addition to these improvements, fabricators now have an extremely simple practice which minimizes distortion in plates resulting from flame-cutting. A subcontractor engaged in preparing plates for armored vehicles has discovered that if the plate is flame-cut when submerged in water, distortion is held to a minimum, straightening operations are not necessary and closer tolerances can be maintained. The best results seem to be obtained when the plate is covered by a quarter-inch of water.

This simple stunt is typical of many improvements in technique which have come out of the war effort. They will help to reduce costs in the postwar period. —p. 80

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TEST CASE BREWING? Watch for the next chapter in the labor relations thriller now being enacted by NLRB and the management and employes of Thompson Products Inc. and Thompson Aircraft Products Co.

Last week the 11,000 employes of these companies, in the second NLRB-supervised election within two years, voted overwhelmingly to retain their open-shop status. The combined vote of eligible ballots was 2823 for the AFL and CIO unions involved and 6615 against these unions. The CIO started to "organize" Thompson employes seven years ago and is reported to have spent $1,000,000 in this thus far futile effort.

The case has significance because Frederick C. Crawford, Thompson president and former president of N.A.M., addressed employes at mass rallies prior to the election. The unions may claim company interference in violation of the Wagner act. Presumably Mr. Crawford pitched his remarks to conform to recent court rulings on the "freedom of speech" interpretations of that act.

This may prove to be a test case of justice under the present government labor relations policies. —p. 54

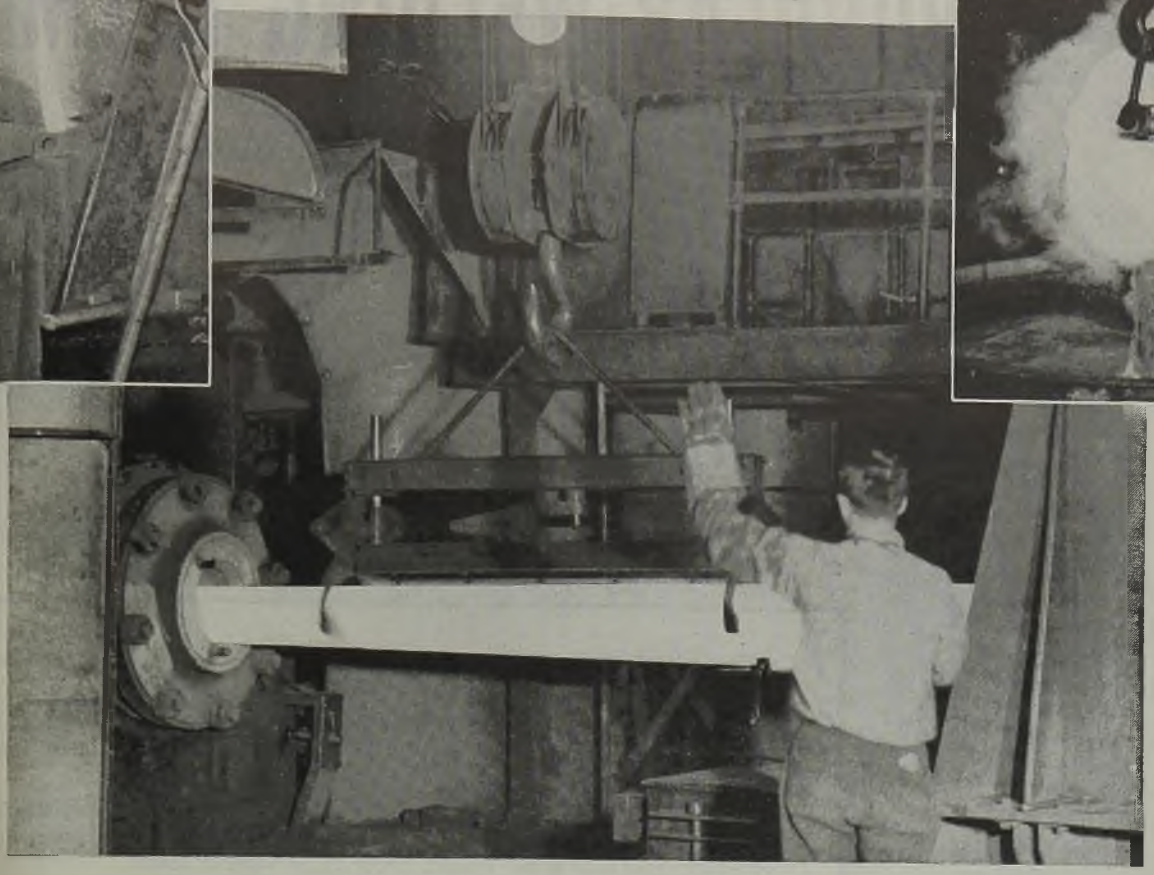
E. L. Shaner

EDITOR-IN-CHIEF

A gun lug not meeting tests in a centrifugal casting machine.

Quenching a centrifugally cast 90 mm. anti-aircraft gun barrel.

Drawing a gun barrel from one of the centrifugal casting machines.



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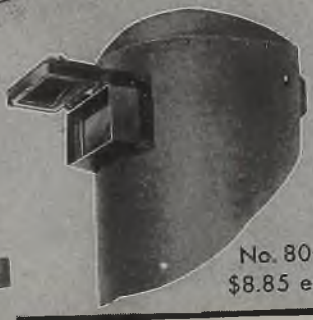

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$7.05 each*

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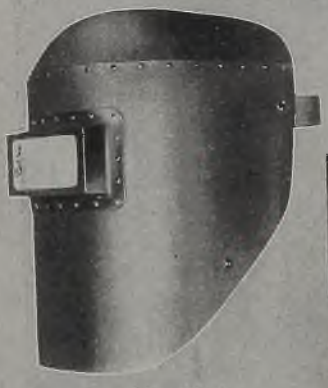
$3.40 each*

No. 66
$4.75 each*



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Battlefield scrap, although not yet received in this country in quantity, is accumulating in European and Pacific theatres, will be a factor in market when more shipping and labor become available. Here is shown a pile of wrecked truck parts in new Caledonia. NEA photo

Weakness Spreading In Price Structure

Many grades of scrap selling below OPA ceilings as consumers begin to reduce inventories in preparation for war contract cancellations. WPB Steel Division warns mills not to permit stocks to dwindle too much

CONSIDERABLE easiness has developed in the iron and steel scrap markets ver the past several weeks and many ades now are moving at below ceiling ices.

Anticipating an early end of war in urope and a decline in steel operations any steel plants are staying out of the arket in an effort to reduce inventories. tocks at mills now vary widely—from 0 days' supply to as much as three or ur months' supply.

An exception to the general picture is ted in cast grades which are scarce d on which prices are relatively firm.

The weakness first developed on the st Coast where scrap has been movat less than ceiling prices throughout year. Supply in the West normally eeds demand and the weakness there not reflected in eastern markets. hin the past several weeks shading of es was reported on the East Coast buyers became cautious. This attiy caused prices to break rather sharpnd some recent sales have been reed at $2 to $4 a ton below the OPA gs.

e reluctance of mills to build up inries in the face of favorable war and expectations of severe cutbacks munitions program prompted the Division of the War Production to sound a note of warning against tting stockpiles to decline too low. etter to producers, Norman W. Foy, or of the division said:

eports received by the Steel Divishow a steadily declining mill inry of steel scrap. Currently the y of steel scrap may not represent blem to certain companies in the in, but the tendency for the steel in to permit further reduction in inventories can readily promote a drying up of normal scrap flow and the complex sources of supply. Also, there results a further deterioration in the labor supply in the scrap metal industry. Such secondary effects might ultimately produce shortages affecting steel production.

Peace Speculations Hazardous

"There are reasons to believe that declining inventories are related to the hopes for early cessation of hostilities in Central Europe, but it must be apparent that speculations of this sort involve certain hazards with respect to the maintenance of steel production to meet full military and essential civilian requirements.

"Producers are not asked to purchase scrap which is not needed, but it becomes desirable to point out that if mill inventories are reduced to the point where producers are unable to cope with changes which might occur as the result of the fluidity of war, the Steel Division may not be in a position to guarantee a sufficient scrap supply through allocations.

"We therefore strongly urge each producer to consider the scrap inventory problem, both in the light of current requirements and the fact that any future shortages through inventory reductions possibly cannot be made up by allocations."

Collection and preparation of scrap is being seriously handicapped by a shortage of manpower and of trucks and tires. Stocks in most dealers' yards are light.

Comparatively small quantities of battlefield scrap have been received in this country to date, due to a shortage of shipping space and labor to segregate it. Much of this material will not be desirable due to the varying alloy content. Components of a tank, for example, will contain many grades of alloy and considerable time will be required to sort it. An increase in the movement of this material is anticipated when shipping and labor becomes more plentiful.

A summary of the scrap situation in leading consuming centers follows:

CHICAGO—Prospects for an early end of the war in Europe are threatening stability of the scrap situation here. With consumers well fortified by inventories and currently out of the market, it is probable the resulting weakness may crack the price structure soon. Until the last few days, open hearth grades have been maintained at OPA ceilings, but

now machine shop turnings have dropped to a level $2.75 or more below maximum.

Consumers' stocks, it is estimated, approximate two months' supply, and receipts of material on order in the next 30 days probably represent another month's supply. Thus, it would appear that steel mills have on hand or on order sufficient melting material for 90 days at the present rate of operations.

It is becoming increasingly apparent the steel industry does not expect to be caught with more than normal inventory at war's end. To safeguard against such a condition, it has for the past few weeks been buying selectively and sparingly and limiting deliveries to 30-day instead of the customary 60-day periods. It also has been prone to cancel shipments not made within the specified time. In some cases, even allocations of railroad scrap have been refused.

C. D. Scully of the OPA scrap section, Washington, held a conference here of district scrap brokers and dealers Aug. 30.

Consensus indicated some assistance can be derived by suspending certain restrictive regulations, such as those applying to mixed shipments, shipping zones, resale, rejected cars without OPA grade certificate, etc., which are justified in a sellers' market but which are operating adversely in a buyers'. Maximum price structure can remain in force for the emergency, but it is believed probable that a free market will exist from now on.

PHILADELPHIA — Where scrap consumers have not already reduced inventories to 30 days, they are trying hard to do so. This is due primarily to the possibility of an early cessation of hostilities in Europe, with the likelihood of a further sharp break in prices. As a matter of fact, the whole tone of the market is easy, except on cast grades and one or two specialties, such as chemical borings, and it would not prove surprising if further declines occur before the war ends in Europe.

Within the past few days No. 1 and No. 2 melting steels and hydraulically compressed black bundles have settled to a level of $17.25 to $17.75, delivered district consumer plants and not including broker's commission of 50 cents (which is already fast disappearing) and low phos punchings and plate scrap to a range of $20 to $20.50.

Yard scrap is coming out slowly as collections are light due to shortage of labor. Some district yards have now practically processed all material on hand and even this does not amount to a great deal. The major portion of scrap being currently consumed is manufactured scrap and despite certain cutbacks and cancellations the supply of this material is well sustained. In fact, it is believed that the recent break in the market on heavy melting steel grades, as well as in turnings, was due to the substantial amount of manufactured scrap being thrown on the market.

In addition, while not a major factor so far, battlefield scrap is being offered more freely through Frederick, Md., with lots

NORMAN W. FOY

of a couple of thousand tons or so now being offered every week or so.

Consumer purchases have now dropped to a point where any adverse news from the other side or any indications that the war in Europe might continue longer than generally anticipated might result in a quickening of buying and stiffening in prices.

	Ceiling Price	*Delivered Consumers' Plants
No. 1 and No. 2 melting steels and hydraulic compressed black bundles	$18.25	$17.75
Machine shop turnings	13.25	12.50
Mixed borings and turnings	13.25	12.50
Short shoveling turnings	15.25	14.50

*Not including broker's commission of 50 cents.

PITTSBURGH—Scrap consumers expect a decline in steel demands before year's end, and are trimming inventories by staying out of the market.

Scrap buying by most mills has been on a 30-day basis. At the end of each 30-day period, all unshipped orders are canceled, but most mills issue new orders for the ensuing month which cover not only the unshipped tonnage but whatever additional tonnage may be needed to keep their inventories at normal levels, usually 90 days' supply.

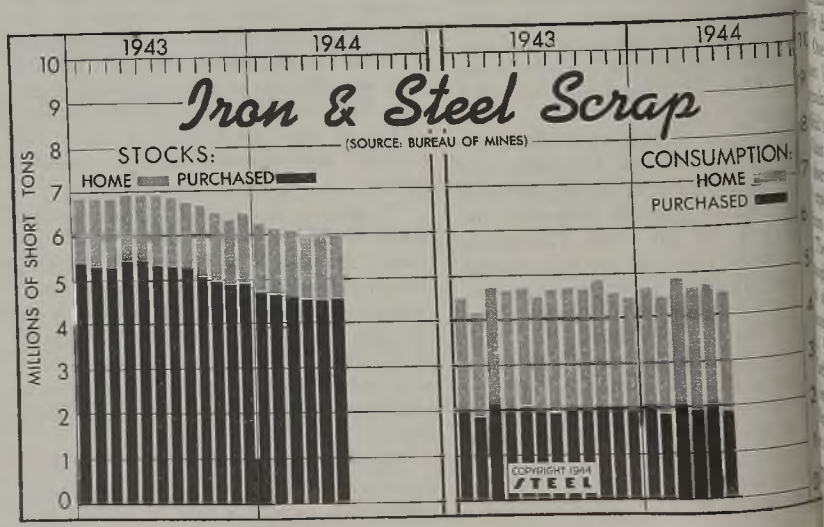
The September situation in this district indicates that the mills have in most cases issued orders covering the unshipped tonnage, but no new buying.

Weakness in the market can be attributed to this factor, and probably to no other. With no new buying for September, brokers and dealers have been quick to use the greatest known lever to spur buying—lower prices. The first move has been to waive all freight "springboards," and in some cases, brokers' commissions as well. This means the mills can now buy scrap at $20 delivered instead of $20.50 plus freight springboards. There has also been some scrap offered at $19.50, with no takers reported as yet.

One prominent buyer reports his supply of hot metal has increased to the point where the melt is now only 30 per cent scrap, as against 50 per cent a few weeks back. Another buyer points out that in addition to the possibility of lower demand later, the manpower situation will force his open hearths to operate at lower rates during the next few months. A relatively large number of school-age boys have been working in the mill during summer vacation and opening of the fall term will mean most of these have to head back for the schoolroom.

One additional factor which may be contributing to the immediate weakness in the market is the failure of OPA ceilings to discriminate between No. 1 and No. 2 heavy melting steel. Both can be had at the same price under ceilings, and both are on the level of No. 1 steel before the war. Actually there has been little No. 1 steel available. The primary requisite for No. 1 steel is that it be ¼-inch and heavier in thickness. Actually there is no material of this weight now being shipped on orders for open hearth grade. Buyers, noting this fact, can well insist on the dollar differential to which they were accustomed before the war. It is reported here that all steel being offered under the $20 ceiling is actually No. 2 heavy melting steel.

SAN FRANCISCO—Iron and steel scrap markets in the San Francisco area and on the Pacific Coast in general have been easing gradually for more than two months, a trend which has appeared



the East Coast recently and is becoming increasingly apparent in other eastern centers.

Since the first of this year, virtually all Pacific Coast scrap consumers have been buying material on the basis of use value and have established differentials for grades. This is reflected in the wide discrepancy between present prices and OPA ceiling levels, a difference which is being extended on some grades by current forward buying.

Following is range of the current market for leading grades compared with ceiling levels, all prices being f.o.b. dealer yards at San Francisco, Oakland and Los Angeles:

	Per Gross Ton Current Market	Ceiling
No. 1 railroad	$15.58	$17.58
No. 1 Scrap rails	15.58	18.58
No. 1 Heavy melting	15.58	16.58
No. 2 Heavy melting	14.58	16.58
Nos. 1 & 2 dealers bundles	13.58	16.58
No. 3 dealers bundles	10.00	14.58

Present market for machine shop turnings is $4.50 a gross ton.

Quoted ceiling prices are less the switching charge. Add 42 cents per ton in each instance for basing point ceiling.

Most recent easing in prices is for No. 1 and 2 dealers' bundles which now are being purchased at $13.58 a ton for September delivery. This is a reduction of $1 a ton from previous levels.

The easing trend in the Coast scrap situation since the first of the year reflects, initially adequate inventories in general, but more recently it results from prospects of an early end of the European war and the desire to reduce stockpiles to levels more in line with prospective cutbacks and postwar operations.

All major consumers have been and are remaining in the market and the reduction in inventories has been gradual. This policy is being followed to avoid breaking up of scrap dealers' organizations, as any sudden and widespread cessation of buying would create a situation of great potential harm in future years. Inventories in general are "comfortably adequate", and some big interests actually have increased stockpiles sharply during the past year or 18 months. One of the Coast's biggest scrap users has tripled its inventory since beginning of the war.

Battlefield scrap is not coming into the Pacific Coast in heavy amounts, and industry observers close to the situation do not expect to see any heavy movement from offshore for some time to come. They point out that there neither are enough bottoms to handle a heavy amount of scrap imports in the Pacific, or enough time to prepare it for shipment. Bulk of the material classified as "battlefield scrap" actually is material being salvaged from vessel repairs at Mare Island and Pearl Harbor and other repair yards.

DETROIT—All varieties of scrap, except cast, are weaker and are selling $1.50 to $2 below ceilings. First weakness appeared when a consumer bought here for shipment by vessel to Buffalo, paying only the Pittsburgh delivered price on open hearth grades, or about $2.25 below the Detroit ceiling. Dealers' buying prices currently are as much as $3.10 below the OPA ceilings.

	Ceiling Price	Dealers' Buying Prices-Current
Heavy melting steel	$17.85	$14.75-$15.25
No. 1 busheling	17.85	14.75- 15.25
Hydraulic comp. bundles	17.85	14.75- 15.25
Flashings	17.85	14.75- 15.25
Machine shop turnings	12.85	9.75- 10.25
Short turnings	14.85	11.75- 12.25
Cast iron borings	13.85	10.75- 11.25
Low phos. plate	19.85	17.50- 17.75
No. 1 cast	20.00	19.50- 20.00
Heavy breakable cast	16.50	16.00- 16.50
Clean auto cast	20.00	19.50- 20.00

YOUNGSTOWN — Softness has developed in iron and steel scrap market within the past month and steel plants are showing little interest in building up inventories.

District scrap dealers are buying some scrap at prices ranging from $2 to $4 a ton under the OPA ceiling prices, although the steel plants are reported still paying ceiling prices for whatever they take. The steel plants are reported stocked up fairly well with good quality scrap.

Current reluctance of steel plants to stock up further reflects an unwillingness to chance being caught with high-priced scrap, should the war end suddenly, and also a feeling on the part of some steelmakers of a forthcoming reduction in steel operations.

Three of the largest scrap consumers here (Youngstown Sheet & Tube Co. Republic Steel Corp., and Sharon Steel Corp.), have been entirely out of the

(*Please turn to Page* 172)

Present, Past and Pending

■ EUROPEAN LOCOMOTIVE REPAIR PROGRAM LOOMS

NEW YORK—Advices from abroad estimate 20,000 locomotives will need repair in Europe after Germany's collapse. These advices spike reports current here that inquiries for thousands of new locomotives will be placed before American builders following the armistice. American locomotive interests anticipate some buying, but the total will not run as high as has been rumored.

■ NATIONAL CAN CORP. AWARDED LARGE SHELL CONTRACT

NEW YORK—National Can Corp. has been awarded contract for 155-millimeter explosive shells totaling about $8 million to be produced in the Minneapolis-St. Paul ordnance district.

■ JULY MACHINE TOOL SHIPMENTS OFF 18.2 PER CENT

WASHINGTON—July machine tool shipments decreased 18.2 per cent, valued at $33,916,000 compared with $41,471,000 in June, the WPB Tools Division reports. Value of net new orders during July fell 33 per cent below June, while order backlogs on July 31 were off 6.8 per cent.

■ MANY POSTWAR PROJECTS PLANNED AT CHICAGO

CHICAGO—Substantial proposed postwar construction projects were included in the enumeration of industrial developments in Chicago Area in August. The month's activities aggregated $4,571,500 in value of investments, bringing total for eight months to $58,042,916.

■ INCREASE IN POSTWAR AUTOMOBILE PRICE SEEN SMALL

SOUTH BEND, IND.—Studebaker Corp. announces plans for postwar automobile sales double 1941 volume, at prices only slightly higher. Studebaker has placed orders for needed machine tools.

■ WPB STEEL DIVISION OFFICIALS RESIGN

WASHINGTON—H. Walker Davis, chief, sheet section, Steel Branch, and Paul Shucker, chief, Export Branch, have resigned from the WPB Steel Division.

■ ARMCO SELLS SHEET MILL UNIT TO REYNOLDS METALS

ASHLAND, KY.—American Rolling Mill Co. has sold its No. 2 sheet mill here to the Reynolds Metals Co. The mill will be rebuilt for rolling aluminum.

■ STEEL EXPANSION REPORT DEADLINE EXTENDED

WASHINGTON—WPB Steel Division has extended the time for steel mills to answer questionnaires in connection with the steel expansion program. The survey is being made by W. A. Hauck, of the Steel Division.

■ COAL PRODUCTION RETARDED BY STRIKES

PITTSBURGH—Bituminous coal production in western Pennsylvania is being retarded at the rate of about 35,000 tons per day by strikes of mine supervisory employes seeking union recognition. Nine mines are reported down and strike notices have been served at 62 others. Walkouts would seriously threaten steel production.

OPA Aims for Full Production, Full

Transitional period prices to be fixed on cost-plus-profit at high rate of operations basis. Objectives will be to check living costs and prevent collapse in the national economy

WASHINGTON

PRICES during the transitional period will be fixed on a cost-plus-profit basis and will be designed to promote a full-production, full-employment economy. The Office of Price Administration has made considerable progress in planning reconversion pricing and is expected to be able to supply manufacturers with price information promptly when these manufacturers prepare to resume production of civilian goods.

The cost-plus-profit policy is based on the concept that a lot of employment will be necessary in the postwar period, that private industry will have to furnish the greater portion of this employment, and that private industry cannot contribute effectively to this objective unless it makes profits.

At the same time, the OPA is not viewing the price control problem only from the standpoint of private industry. Its primary interest is the overall effect of price control in the reconversion period. The first objective is to hold the cost of living in check. The second, which to a considerable extent gears into the first, is to prevent a collapse in the economy.

"If prices are set too high," says Price Administrator Chester Bowles (STEEL of Aug. 21, p. 67), "our savings and current dollar income will be dissipated to pay unnecessarily high prices, and we will soon find ourselves repeating the deadly cycle of 1919 with booming inflationary prices followed by an inevitable collapse and economic disaster."

Seeks To Avoid Danger

On the other hand, Mr. Bowles adds, the OPA will be particularly concerned not to set prices which would force deflation of the general wage level. He wants to avoid a dangerous situation which would result if public purchasing power is lowered any more than is absolutely necessary.

He is thinking not only of the bad effects that might come from a reduction in hourly wage rates, but also of those that are quite certain to result from the elimination of overtime pay.

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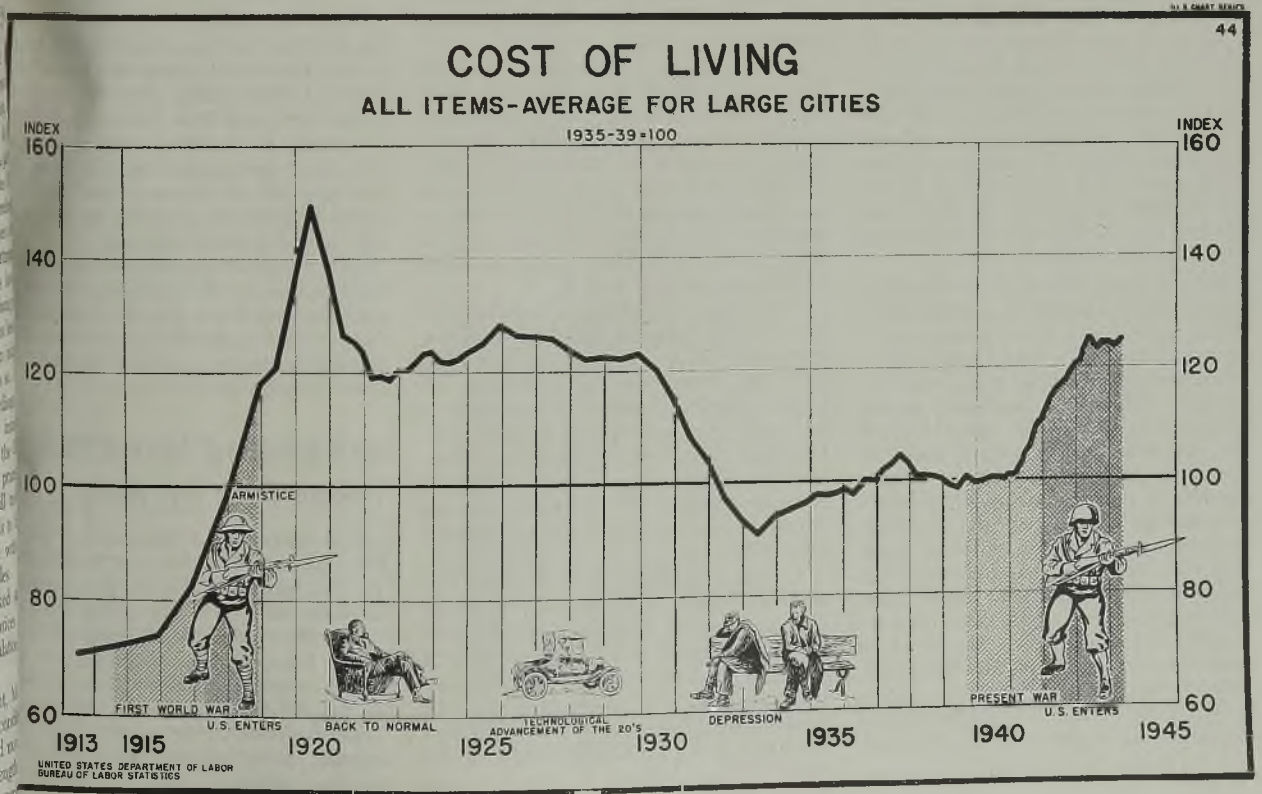

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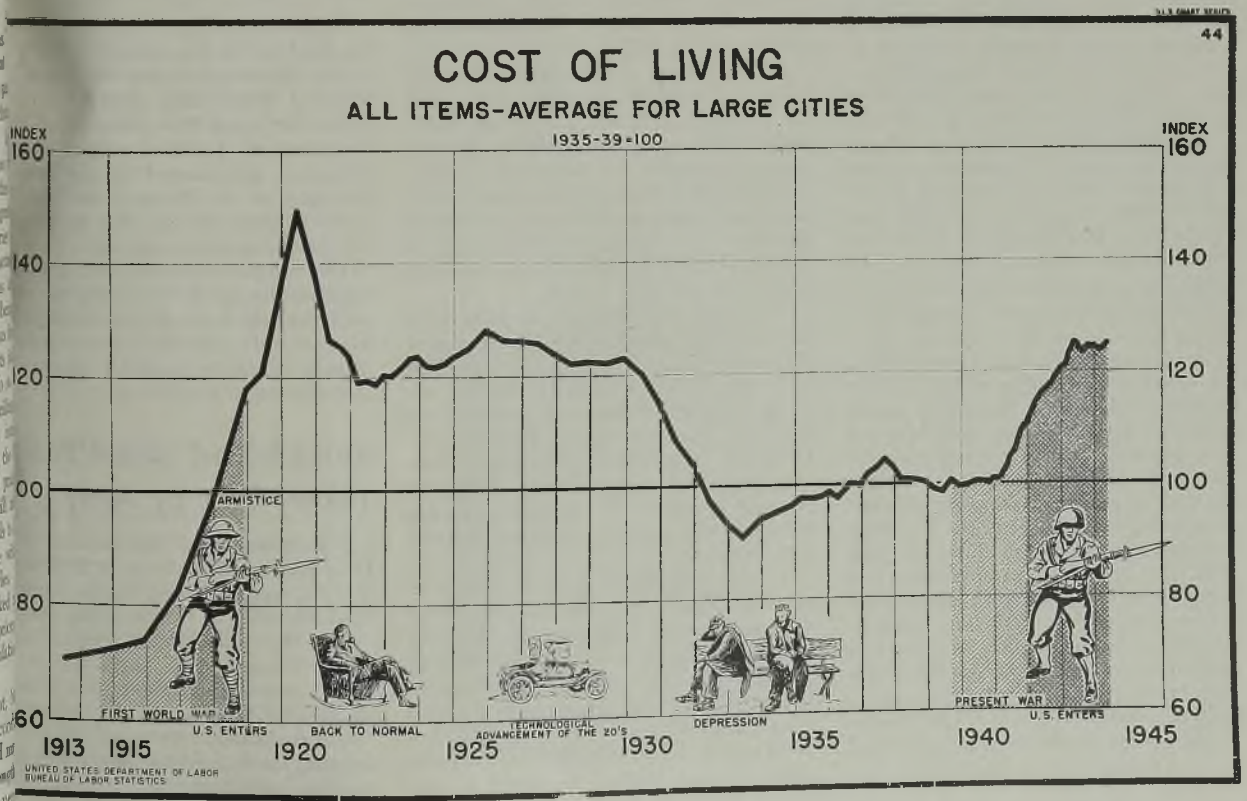

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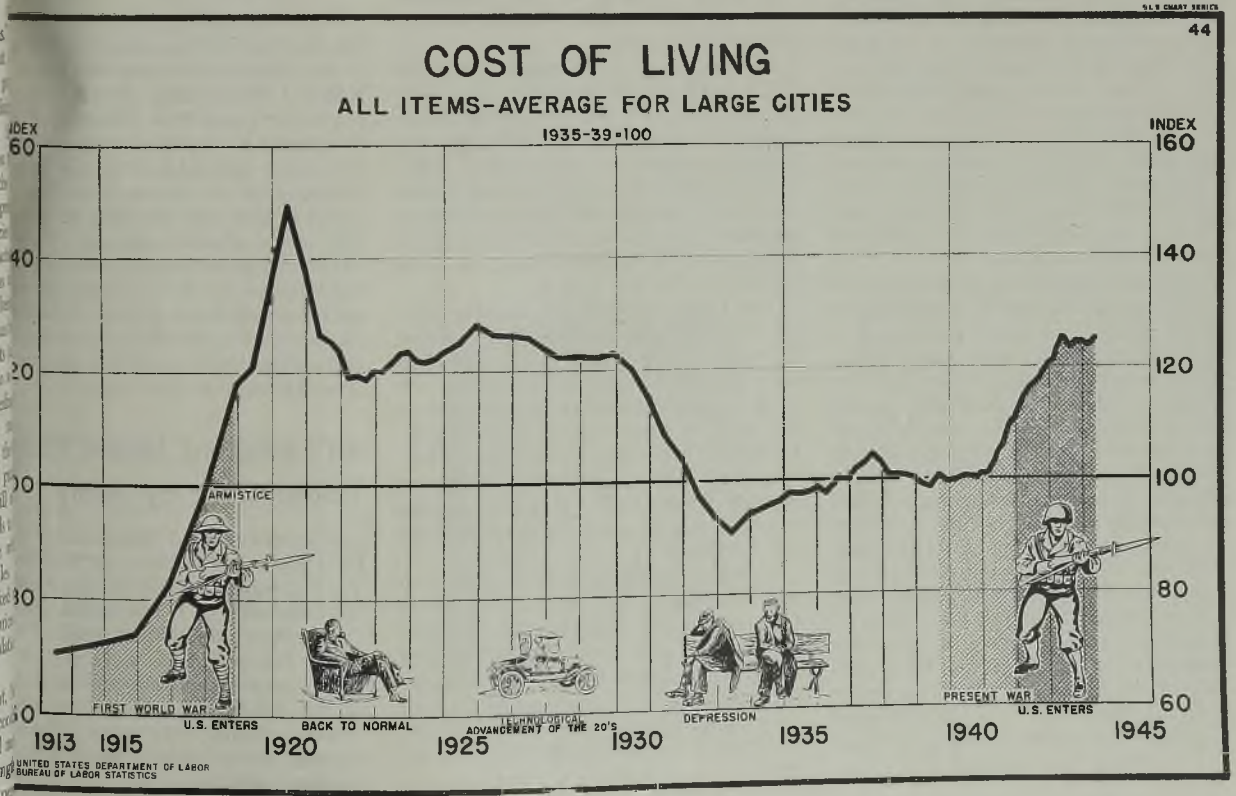

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"Having demonstrated what we are capable of producing when we put our minds to it, we are not going back to half-production and half-employment and half-consumption after the war," says Mr. Bowles. "Our farmers and workers have tasted, for the first time in a generation, the fruits of all-out production of full employment and wages. They are not going to unemployment, insecurity, and a handout to keep body and soul together. And our businessmen know what it means to have a market for everything they can produce, they know what a full-production, full-employment economy means in terms of the dollars they can bank. They are not going to take shrinking markets lying down."

Hence, says Mr. Bowles, prices must be set to tap mass markets, "prices that yield profits on the basis of volume, not on the basis of mark-up." Despite achievements in mass production in the past, says Mr. Bowles, too many of our industrial leaders have failed to appreciate this need; too often in the past they have lacked imagination to tap mass markets.

"Tried To Play Safe"

"They tried to play it safe by pricing their products to yield a profit at 50 per cent of capacity, with the result that their operations never got much above 50 per cent of capacity, while men went without jobs, and consumers without goods. The national income as a whole has run at half what it might have been, so that all of us, business leaders as well as everybody else, have earned far less than we might have done," says Mr. Bowles.

"During the reconversion period we propose to price on a full-production basis," he adds. "That means stable prices and narrow margins."

OPA officials insist that in setting prices in the reconversion period they do not propose to cram anything down the throats of manufacturers. In those few cases in which reconversion period prices already have been fixed, the OPA action was taken only after comprehensive discussions with the industries concerned. When some of the manufacturers participating in these discussions have argued against OPA proposals as being too rigid and restrictive, the OPA has been willing to compromise when, in its judgment, it seemed fair and wise to do so.

In establishing price ceilings, by the give-and-take method in industry advisory committee meetings, the OPA takes the position that the fixed prices are not necessarily final. "We will modify and change our pricing methods to fit changing conditions and in line with our experience," says Mr. Bowles. "Pricing, or prices, will be rechecked at regular intervals and all new prices will be subject to prompt recalculation if they are out of line."

In making this statement, Mr. Bowles has in mind the fact that conditions during the reconversion period may not stay put for any substantial length of time. During the transitional period many

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SEATTLE

A return to the 1940 level of production would mean more than a 30 per cent decrease "and a shocking figure of 20 million unemployed—an increase of 12 million over the actual unemployment of 1940—assuming the same hours of labor as in 1940." This prediction was made here last week by Chester Bowles, OPA administrator, before the Seattle Chamber of Commerce. Unless our productive power is fully unleashed and unless we are running at full productive capacity, the four major groups in our economy — labor, management, farmers and ex-servicemen—soon "will be fighting among themselves—each for a share of the meager economic pie," he declared.

nployment

manufacturers will start production of civilian products while they still are working on war contracts. Many for a time will be able to obtain only limited quantities of materials, with resultant higher unit manufacturing costs. Many will be able to reduce their costs by utilizing improved technological methods developed during the war, and whose full cost significance cannot yet be measured accurately. The OPA attitude is hat prices, therefore, must be subject to change whenever circumstances make such action advisable.

To confront the problem of price control during the transitional reconversion period, the OPA has accumulated results of extensive market research work. Its studies are concerned basically with the overall economy, rather than with individual products or markets. Where a manufacturer, or an industry, thinks in terms of an individual product, or the market for that product, the OPA thinks of that product in terms of all products and all markets.

Where a manufacturer of paring knives, for example, looks at the paring knife market when he thinks of his production in terms of volume, costs and prices, the OPA not only looks at paring knives but it tries to visualize paring knives in relation to the thousands of other civilian products, and in relation to the economy. It is out of this variation in point of view that the price on paring knives is resolved.

A typical case is that behind the OPA announcement, July 20, that prices on steel inner coil springs for beds and upholstered furniture might be increased 9 per cent above the level frozen in March, 1942. Initially the OPA agreed that prices should be high enough to enable the inner coil spring manufacturers to earn profits at least as high, before taxes, as those they earned in the 1936-1939 period.

Fill Out Questionnaires

Questionnaires were filled in by the manufacturers to show, on the one hand, their costs in March of 1942 and, on the other, their costs under present conditions. The manufacturers also reported on the overall condition of their business, showing how they charged overhead, etc. When OPA representatives got together with the industry to arrive at a decision a long give-and-take discussion took place. The OPA platform to the inner coil spring industry was, in brief, as follows:

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2—You are all engaged in other work which is taking care of your overhead in a general way. Therefore, we do not feel that any price increase should carry an allowance for overhead.

3—Some of you operated in the red in the manufacturing of inner coil springs during normal years. We do not feel the price should be so high as to permit profits to companies that did not normally make profits.

4—You have substantially all the necessary equipment, and the price of your main raw material, steel, has not gone up. Hence the price need not allow for any increases resulting from equipment or material.

5—Your labor cost for manufacturing inner coil springs, including both direct and indirect labor, has advanced to the point of raising factory costs 9 per cent above the level of March, 1942. This warrants an advance of 9 per cent in your prices, the only advance we can justify.

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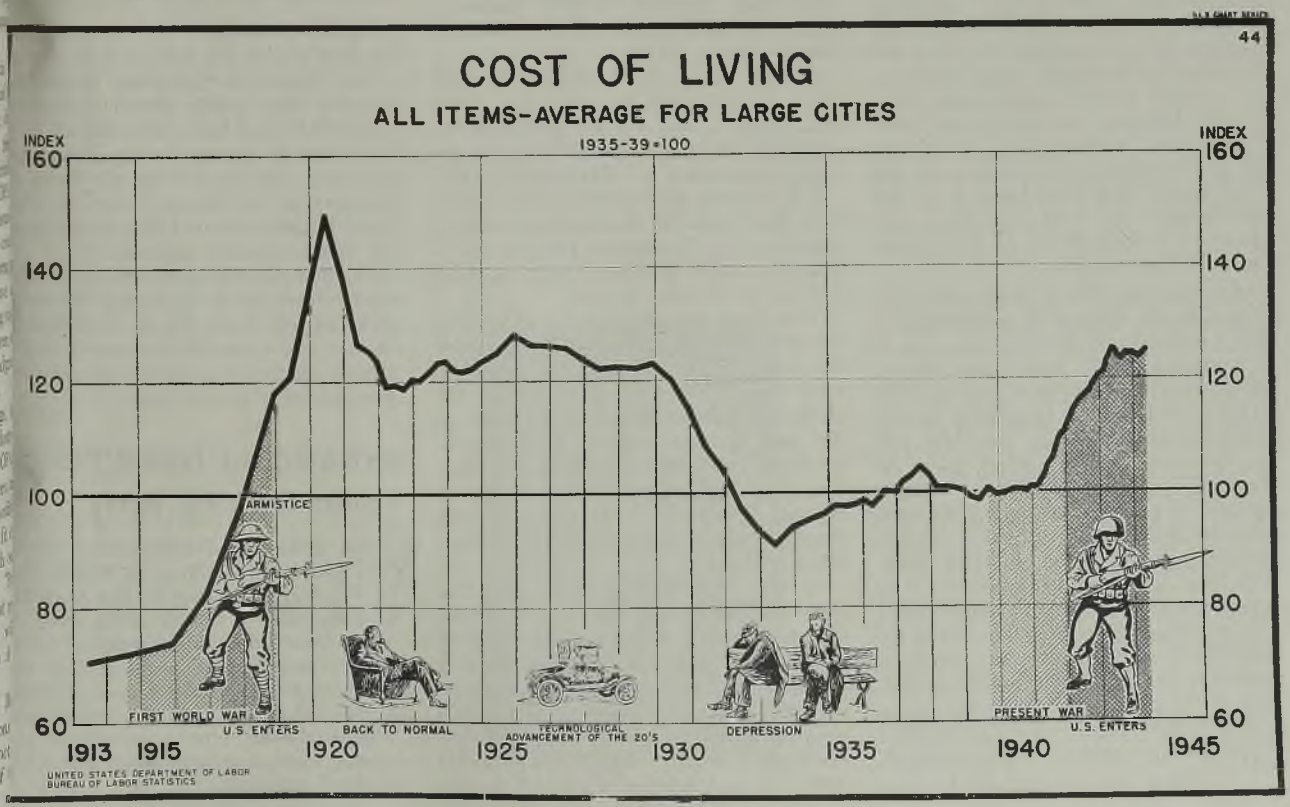
Some of the inner coil spring manufacturers made strong pleas for an additional increase, but the industry as a whole finally came to agreement with the OPA on its contention that 9 per cent would be fair, at least for the present.

The same procedure was followed in determining a 7 per cent increase in prices on steel cots, announced April 11, and an increase of 10 per cent on sofa beds and studio couches, announced April 17, also in determining that there would be no increase in prices on overstuffed furniture and electric flat irons, as announced, respectively, on Feb. 28 and Aug. 24.

An especially interesting case is that involving the electtic flat irons, in which 20 manufacturers having allocations to produce 1,768,968 electric irons agreed to market them at the March, 1942,



OPA Aims for Full Production, Full Employment

Transitional period prices to be fixed on cost-plus-profit at high rate of operations basis. Objectives will be to check living costs and prevent collapse in the national economy

WASHINGTON

PRICES during the transitional period will be fixed on a cost-plus-profit basis and will be designed to promote a full-production, full-employment economy. The Office of Price Administration has made considerable progress in planning reconversion pricing and is expected to be able to supply manufacturers with price information promptly when these manufacturers prepare to resume production of civilian goods.

The cost-plus-profit policy is based on the concept that a lot of employment will be necessary in the postwar period, that private industry will have to furnish the greater portion of this employment, and that private industry cannot contribute effectively to this objective unless it makes profits.

At the same time, the OPA is not viewing the price control problem only from the standpoint of private industry. Its primary interest is the overall effect of price control in the reconversion period. The first objective is to hold the cost of living in check. The second, which to a considerable extent gears into the first, is to prevent a collapse in the economy.

"If prices are set too high," says Price Administrator Chester Bowles (STEEL of Aug. 21, p. 67), "our savings and current dollar income will be dissipated to pay unnecessarily high prices, and we will soon find ourselves repeating the deadly cycle of 1919 with booming inflationary prices followed by an inevitable collapse and economic disaster."

Seeks To Avoid Danger

On the other hand, Mr. Bowles adds, the OPA will be particularly concerned not to set prices which would force deflation of the general wage level. He wants to avoid a dangerous situation which would result if public purchasing power is lowered any more than is absolutely necessary.

He is thinking not only of the bad effects that might come from a reduction in hourly wage rates, but also of those that are quite certain to result from the elimination of overtime pay.

"When the work-week drops from 48 hours to 40, overtime payments of some $12,000,000,000 will drop out," he says. "To that extent there may be a drying up of potential sales. During the reconversion period there is bound to be some unemployment. Even with adequate unemployment insurance this will mean a further reduction in the purchasing power of many of our workers. If the prices on reconversion items are set too low they may further add to this dangerous drop in national purchasing power and hence help pave the way for another depression."

In other words, as the OPA sees it, there is a potential price level for each product which would satisfy the ideas of all the manufacturers of that product. On the other hand, there is a potential price level which would force most of the manufacturers to seek drastic cost reductions in order to stay alive. The OPA believes that prices should be set somewhere between these two extremes.

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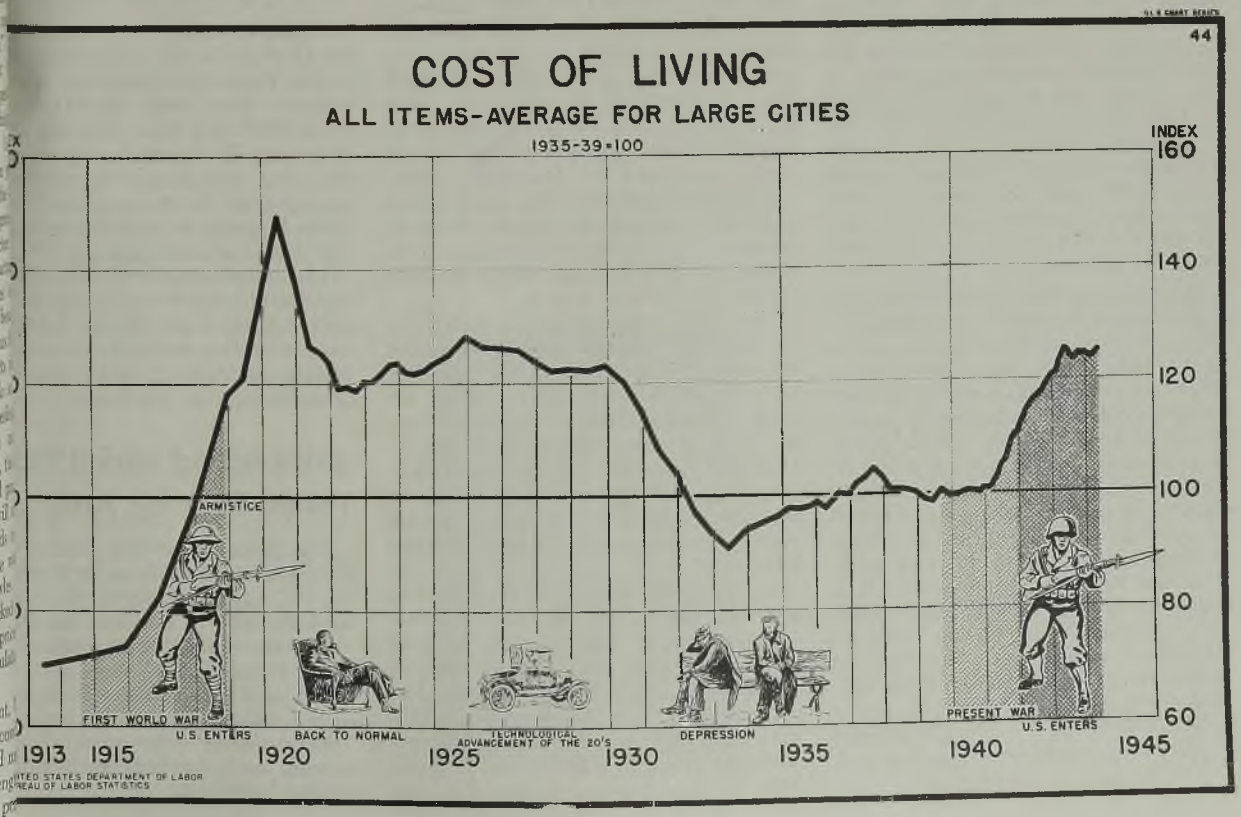

prices, ranging from $5.30 to $11.70. The bulk are automatic irons in the $5.70 to $8.75 price range.

A feature of the agreement was a decision to eliminate, for the time being, the prewar "fighting" brands of irons which used to sell in the chain and drug stores around $2.79. It was the consensus that the immediate reconversion period, with its serious problems of maintaining purchasing power and employment, will be no proper time to encourage production of goods to be sold at cut prices. Rather, it was felt, it would be better to put the industry in a position in which it could continue to pay present hourly wage rates, and at the same time make quality irons which would give the buyer every bit as much value as he got for his dollar when buying standard irons in March, 1942.

Increases Do Not Represent Maximum

The increases mentioned above do not at all represent the maximum the OPA is willing to authorize. Recently the piano parts industry was allocated some material and it at once became apparent that some of the companies in this industry would have to raise their prices by substantially more than 10 per cent due to being located in areas where labor costs rose sharply due to war conditions. An "adjustable" pricing order was issued under which the manufacturers may make and ship piano parts at the old prices with the privilege of supplementary billing at a later date to cover such price increases as may be granted. The OPA policy will permit adequate increases to those companies that always in the past earned profits in normal times. But it is expected that manufacturers with present higher-than-average wages resulting from abnormal war conditions may have to go through a process of cost reduction involving the restoration of customary wage differentials. There will be many such cases, the OPA believes, in which it will have to authorize manufacturers to charge high prices calculated to return costs and a fair profit, and then leave it to the manufacturers to work out their own salvation—as they always do in the long run under any conditions.

At present the OPA is proceeding with a considerable amount of deliberation in setting reconversion period prices so as to set a pattern for the hectic times ahead. When materials, manpower and facilities become available for large-scale manufacture of civilian goods, the OPA will have to move fast in setting prices on literally thousands of products. In anticipation, it now is making up standard price fixing formulas to fit the conditions surrounding products of different types. With the help of these formulas, it is hoped, it will be possible to supply prices with minimum delay and thus speed reconversion. While such a short-cut method is necessary in view of the magnitude of the pricing job ahead, according to OPA spokesmen, it will not be allowed to prevent fair treatment to all concerned.

(*Please turn to Page* 170)

"Miscellaneous" Steel Hearing Starts

WLB panel asks fabricators, casting companies and others what procedure they desire. Panel's report in producers' case to be presented to board soon

PROCEDURAL hearings on the cases of 550 "miscellaneous steel companies" and the United Steelworkers of America-CIO began before a War Labor Board panel in Washington Aug. 29. The miscellaneous group includes fabricating companies, casting companies and a few whose products are not related to steel but who hold contracts with the steelworkers' union. Hearings already have been completed before WLB panels in the cases of the steel producers and the iron ore companies and the reports of these panels soon will be presented to the board itself.

A number of the miscellaneous companies have requested hearings on the economic demands of the union be deferred until the board rules on policy to be followed in the steel producers' cases. At the start of the hearing, David L. Cole, chairman of the panel, said 125 of the miscellaneous companies had written the board stating their wishes in respect to their individual cases.

Of these, 20 asked action be deferred until the board had acted in the producers' cases, and that thereafter they be referred back for collective bargaining. Seventeen companies asked their cases be referred back for collective bargaining and then referred to the regional board. One asked its case be referred back for collective bargaining and then referred to the national board. Four asked referral back for collective bargaining with no indication as to their desires thereafter. Seventy-two wish their cases referred to the regional board; many of these wish (1) to be distinguished from the producers, or (2) to be considered in light of their competitive position. One company wishes to have its case heard by a national panel in the region.

Outside Unions Defeated in Thompson Poll

IN two important National Labor Relations Board elections in the Cleveland area last week outside unions were decisively defeated. At the plant of the Thompson Aircraft Products Co. in Euclid, O., voting results were almost 4 to 1 against the outside union, the employe vote being recorded as 4582 against a union and 1276 for the United Automobile Workers—CIO.

At the plant of Thompson Products Inc., in Cleveland the vote was 2333 for no union, 1291 for the United Automobile Workers, and 256 for the International Association of Machinists—AFL.

For the past seven years outside unions have been making determined efforts to organize the Thompson plants. In a similar election in May, 1942, the CIO union was defeated 2 to 1.

This latest election takes on added significance for industry since it is reported the outside union plans to file a petition with the NLRB seeking to nullify the election results claiming interference on the part of management. Frederick C. Crawford, president of Thompson Products Inc., and its subsidiary Thompson Aircraft Products Co., at meetings with employes prior to the election discussed labor relations.

In this connection it is recalled that several months ago the United States Circuit Court of Appeals at Philadelphia ruled the Wagner act "does not purport to authorize a restraint upon the freedom of speech in any circumstances," thus denying a petition by the National Labor Relations Board to hold Edward G. Budd Mfg. Co. and Edward G. Budd in contempt for circulating a letter to the company's 15,000 employes at the time of a union election.

Foundry Company Files Suit Against NWLB

Farrell-Cheek Steel Co., Sandusky, O., has filed suit in the federal district court of the District of Columbia against the National War Labor Board seeking to enjoin the board from enforcing an order issued July 12. The steel company charged the order was entered by the board in disregard of its duties under the War Labor Disputes act and that the company was denied a public hearing.

The complaint says the board violated the Disputes act by including clauses in the order which are directly forbidden by the act and contends that the board is without authority to order maintenance of membership in this case.

Strike-Bound Nickel Plant Taken Over by Army

The strike-bound International Nickel Co.'s plant and facilities at Huntington, W. Va., was taken over by the Army last week on order of President Roosevelt.

The War Labor Board reported to the White House that the strike of 2500 employes of the company was in defiance of the WLB and that the government "vitally needed" the steel alloys and rotating bands for large shells which the company produces.

JULIUS A. KRUG . . . . . *Acting WPB Chairman*

Policy Changes Thought Unlikely In New WPB Setup

Krug, newly appointed acting director while Nelson is in China, expected to continue latter's plan for gradual reconversion of industry. More personnel changes likely

ALL of the smoke has not yet lifted following the recent explosion in the War Production Board so that it is difficult to bring in clear outline the new setup. In a nutshell the picture finds Donald M. Nelson, chairman, on his way to China on a special mission for the President, Charles E. Wilson out as executive vice chairman and on his way back to General Electric Co., and Julius A. Krug, a former WPB vice chairman and since April a lieutenant commander in the Navy, in command as acting chairman.

But more changes in top personnel of the board seem in prospect. In fact, Sidney J. Weinberg, a vice chairman who has been friendly with both Mr. Nelson and Mr. Wilson, last week handed in his resignation, and newspaper reports had it that William Y. Elliott, vice chairman in charge of the Office of Civilian Requirements, and Arthur H. Bunker, vice chairman in charge of the Production Executive Committee, were considering resigning.

Giving support to the view that more changes were likely was testimony of the new acting chairman before a Senate investigating committee. Answering a question by Senator Ferguson (Rep. Mich.) about the "conflict in the WPB between the Wilson and Nelson groups," Mr. Krug said, "They are all going to be in one group or they are not going to work here."

The blowup within the board came suddenly and to some extent dramatically. For weeks past, however, conflict has been reported among the top personnel chiefly over the question of reconversion of industry to civilian goods production. It was inevitable that the bickering would eventually come out into the open and it did with a bang when Mr. Wilson about ten days ago announced his resignation to some 200 policy-making officials of the board, and later at a press conference alleged he had been unfairly attacked by followers of Mr. Nelson.

Whether Mr. Nelson will return to his post as chairman of the board when he completes his mission to China remains something of a question. President Roosevelt told a press conference that he did not know whether Mr. Nelson would resume his duties when he returned.

Meanwhile, the new acting head of the board has taken hold of things and has promised a vigorous administration.

Reorganization of the WPB personnel is not expected to materially change policy of the board, and no serious repercussions on the war production program are seen. The new chief, although away from WPB for several months, is thoroughly familiar with the activities of the board and has indicated he will clean out any personnel which will not cooperate as a unit. He told the Senate War Investigating Committee last week that he fully agrees with Mr. Nelson on the necessity of starting gradual reconversion now and added that WPB is ready to engineer a large-scale shift as soon as Germany surrenders. He further said that Nelson's "spot" authorization plan is the best reconversion plan.

SIDNEY J. WEINBERG

Mr. Krug, though only 36 years old, is not new to government service. A graduate of the University of Wisconsin in 1929 with a major in economics, he first was employed by the Wisconsin Telephone Co. as research statistician. A year and a half later he went to the Wisconsin Public Service Commission, handling technical work on public utility rates and evaluation.

In January, 1936, he joined the Federal Communications Commission, and late in 1937 became associated with the Tennessee Valley Authority taking charge of power operations.

Following this job, Mr. Krug was asked by President Roosevelt to go to Costa Rica to help straighten out difficulties between United States utility companies and the Costa Rican government. When the aluminum program was expanded Mr. Krug was loaned by TVA to the Office of Production Management where he worked with William L. Batt, now WPB vice chairman of the Office of International Supply. Mr. Krug was appointed head of the Power Branch of OPM in June, 1941, and held the same position with WPB until he was named deputy director general and head of the Distribution Bureau in August, 1942. He was appointed director of the Office of War Utilities in early February, 1943, and later that month was named program vice chairman, which positions he held until April, 1944, when he left WPB to accept a commission as lieutenant commander in the Navy.

Shipyards Have Large Backlogs

Portland-Vancouver plants booked for capacity operations for next year. Labor shortage in Kaiser yards is acute. Seven-day work week will be inaugurated

PORTLAND, OREG.

PRINCIPAL shipbuilding yards in the Portland-Vancouver area have backlogs that will require capacity operations for the coming year and in some instances to the end of 1945.

Some complaint is heard about the shortage of plates. Deliveries are up to quota allowances but particularly in the case of Swan Island, constructing tankers, the quotas are declared below requirements for full operations. As is well known current contracts are subject to cancellaton depending on the turn of war events but, as at present, shipbuilding activity will continue in this area until the close of 1945.

Labor shortage is more acute at the three Kaiser yards than at the smaller plants which were established before the war. The Kaiser yards need 14,000 additional workmen and, while the percentage of turnover is about equal to plants in other parts of the country, it is difficult to meet schedules. At one yard where normal employment is 27,000, the last badge issued numbered 107,000 showing the heavy turnover in three years. The greatest need is for welders, electricians and sheet metal workers.

To speed construction of AP-5 troop transports, which have A-1 priority at present, 60,000 employes of the Kaiser yard at Vancouver and the Kaiser Oregon Shipbuilding Corp. are about to inaugurate a 7-day work week which has the approval of the Maritime Commission, the Pacific Metal Trades Council and the employers. Double time will be paid for the seventh day.

Other construction was temporarily halted at Oregon and Vancouver to undertake the rush job for AP-5, the first delivery of which was made by Oregon Aug. 13. Vancouver was previously building C-4; and Oregon, the Victory type. AP-5 involves a large increase in welding and sheet metal work. To undertake the conversion some changes in the ways was necessary but little new equipment was required. However, considerable changes in crews were involved while the various crafts were forced to adjust themselves to the new work.

Following the end of AP-5 construction, Vancouver will return to building the AP-4 type while Oregon will resume construction of AP-3. This yard has contracts for 125 units of two types while Vancouver, which has delivered 32 Victory ships, has an unstated number of AP-4 to build.

The Kaiser yards do comparatively little subcontracting, their facilities being so extended that most of the work can be done within the various branches of the organization. Subcontracting is confined largely to joiner work and asbestos pipe wrapping.

Albina Engine & Machine Works' backlog extends to May, 1945. It includes four lumber coasters, small tankers, landing craft and other types for both the Navy and Maritime Commission. The labor situation is fairly stable as the nucleus of the working forces is local and has been long employed at the plant which can quickly be reconverted to a prewar basis with facilities for general repair and marine construction jobs.

Commercial Iron Works reports contracts on hand that will carry through the next 18 months. The labor situation is reasonably normal as this plant has a working personnel that has been with it for years. It also is prepared to resume general marine construction and repair after completion of war contracts.

In the Pacific Northwest the wood shipbuilding yards are facing a crisis. Many have been closed already due to completion of Army and Navy contracts for small wood craft, no further work of this nature being immediately available. The Navy has placed contracts for 20 tuna clipper-type wood vessels with local yards but this work will be finished before the end of the year. Private owners are eager to award contracts for fishing vessels but government agencies have refused to permit such construction for the balance of 1944.

Outmigration Plagues West Coast

Employment in war industries in San Francisco area shows net loss of 4000 to 6000 a month. War Manpower Commission moves to provide job security when hostilities end

SAN FRANCISCO

OUTMIGRATION of war workers in this area continues to plague private management and government manpower officials. As a result, the War Manpower Commission through its Northern California Labor Management Committee has begun a program to provide job security for thousands of San Francisco area workers.

The program seeks a "fair break" for local workers when national reconversion to civilian production is started, Sam Kagel, acting WMC director said. "Anxiety on the part of war workers over their postwar future is resulting in job-quitting on an alarming scale," he said. "For some time San Francisco area war worker employment has shown a net loss of 4000 to 6000 a month, a condition that rapidly is reaching proportions endangering our entire war effort."

Advertisements setting forth the position of the Labor Management Committee are being published in Washington, and New York city newspapers by the Victory Manpower Campaign of the Bay Area, a public organization formed to assist in solving the section's manpower problems. These advertisements stress the need that workers here be given assurances that they will not be penalized if they stay on their war jobs. They also propose that appropriate government agencies announce immediately that when Germany surrenders West Coast employers can reconvert to civilian production a portion of their war work provided that this portion can be performed elsewhere or that certain specified critical labor occupations that can be used in war work at that time will not be used on such civilian production.

The campaign also urges that employers should be permitted to take all steps as far as possible at present, such as any paper work that may be involved, scheduling of retooling and building of stockpiles.

New Alloy Steel Pilot Plant To Cost $1.5 Million

SACRAMENTO, CALIF.

The U. S. Bureau of Mines plans to build a steel alloy pilot plant near Shasta dam in Northern California, according to Representative Clair Engle (Dem., Calif.).

Mr. Engle said he had been informed the plant will be used to "test means of combining and using the mineral resources of the entire Northern California area."

Reconversion To Start At Magnesium Plant

SAN FRANCISCO

Reconversion to peacetime production is starting at the San Jose magnesium plant of Permanente Metals Corp., a Henry J. Kaiser subsidiary. The plant completed all war contracts by the end of August.

Permanente, which is one of the two privately-owned magnesium plants in the country, will make "a strong bid" for the country's postwar magnesium business, officials said. Initial reconversion planning includes the development of lightweight truck bodies, automobile parts, home appliances and "other revolutionary peacetime products."

Wartime Immunity Extended WPB Committees During Reconversion

Attorney General Biddle says advisory groups may function in some respects without violating Sherman law during transition while "hostilities continue." Justice Department will not grant blanket immunity

WARTIME immunity surrounding meetings of industry advisory committees with the War Production Board dealing with matters relating to individual mobilization for war will be continued, under certain conditions, during period of reconversion from war to civilian production "while hostilities continue," Attorney General Francis Biddle has advised John Lord O'Brian, general counsel, WPB.

Citing 1941 assurances from the attorney general that meetings might be held with industry on problems of defense, without violating the antitrust laws, and that there would be nothing unlawful in the activities of industry advisory committees if restricted to this purpose, Mr. O'Brian asked whether this policy might now be extended "to consultations with such committees on demobilization and reconversion problems while hostilities continue in this war," adding that "of course, the WPB may seek the advice of persons not on the committees, and the committees will not operate to foreclose in any way the access of businessmen or others to the WPB."

Mr. Biddle, in reply, refused to issue any blanket immunity . "It is particularly important," he wrote, "that the spirit of the Sherman act be preserved in dealing with the reconversion of American industry to peacetime production. The legality under the antitrust laws of such action as you describe is dependent upon many factors, including its possible exclusionary effect on new enterprise and small business, its reasonableness, etc. The department will be glad to co-operate with the WPB in reviewing such plans or programs and attempting to work out such safeguards as may be available to the protection of long-term economic policy without sacrificing the immediate purpose which is to be served.

"As long as hostilities continue in this war, the policy of the department as expressed in the letter of April 29, 1941, will extend to emergency programs which the chairman of the WPB determines are in his opinion necessary in order that the changes requisite to civilian production may be made without impairing the orderly progress of war production. Provided that the operation of these plans be confined to a limited and relatively brief period of time."

In two respects, Mr. Biddle wrote, the policy set forth in 1941 will have to be limited. "First, I ask that each specific plan, before it is put into operation, be submitted to me for advice and individual clearance. Second, I reserve to the department the right to take any action under the antitrust laws, of either civil or criminal nature, if a particular plan is used to accomplish unlawful private ends and such abuse of the plan continues after notice to desist from the department."

POSTWAR PREVIEWS

RECONVERSION PRICING— Cost-plus-profit with operations at near-capacity operation is OPA's design for pricing during the transition period. See page 52.

PLANT DISPOSAL— Defense Plant Corp. to inform all potential buyers of available facilities, establish reasonable prices and grant liberal credit terms to purchasers. See page 58.

AUTOMOBILES— Costs will be final determinant in selection of materials for postwar cars. Iron and steel expected to yield little to light metals and plastics. See page 69.

DODGE CHICAGO— Fantastic DPC-financed, Chrysler-built aircraft engine plant at Chicago has essentials for postwar manufacture of automobiles. See page 74.

CHINA— With her leaders dreaming of industrialization and of building pleasure cars and aircraft after the war, China may become an outlet for surplus American tools and machinery, provided credit can be arranged. See page 76.

DEEP DRAWING TRIUMPH— Experiences gained by manufacturers who collaborated successfully on steel cartridge and steel shell case programs, to wind up with a number of novel but effective deep drawing techniques, are looked upon as invaluable for individual operations to follow the peace. See page 82.

MILLING PROGRESS— Past face milling records fade as coarse-tooth carbide-tipped cutters are stepped up to ever-greater speeds, feeds and amounts of metal removed on alloy and nonferrous parts. See page 84.

BIRTH OF FACTORY— Distance from suppliers and unusual requirements of war contract for tank retrievers moves job shop into rank of full-line manufacturers, strengthening competitive position in utility and special truck body field. See page 86.

BENEFICIATION— Washing and screening of iron ores, as well as fine grinding to obtain high-iron concentration, followed by sintering, are being studied closely by steel producers who are concerned about possible exhaustion of rich ore deposits. Early change in blast furnace methods may follow. See page 98.

MEETINGS . . .

National Metal Trades Association: Eastern plant management conference, Sagamore hotel, Bolton Landing on Lake George, N. Y., Sept. 10-13.

American Hot Dip Galvanizers Association Inc.: Fall meeting, Blackstone hotel, Chicago, Sept. 13-14.

National Metal Trades Association: Western plant management conference, Nippersink lodge, Genoa City, Wis., Sept. 17.

Association of Iron and Steel Engineers: Annual technical conference, William Penn hotel, Pittsburgh, Sept. 25-27.

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

American Institute of Mechanical Engineers: Electric furnace steel conference, Pittsburgh, Oct. 5-6.

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

American Society of Tool Engineers: Twelfth semiannual meeting, Hotel Syracuse, Syracuse, N. Y., Oct. 12-14.

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

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

DPC Officials Outline Three-Point Policy for Surplus Plant Disposal

Adequate publicity to inform all potential buyers of available factories, establishment of reasonable prices, and granting of liberal credit terms will be elements of disposition formula, Senate committee is informed

ALTHOUGH a uniform formula for sale of surplus war plants has not yet been established, the Defense Plant Corp. does have a policy to facilitate their disposition. This calls for: (1) Adequate publicity so that one potential buyer does not have an advantage over another; (2) the setting of reasonable prices; (3) and granting liberal credit terms.

That was the gist of testimony submitted to the Senate Special (formerly Truman) Committee Investigating the National Defense by Sam H. Husbands, president, and Hans A. Klagsbrunn, executive vice president, Defense Plant Corp. Mr. Husbands and Mr. Klagsbrunn also are surplus property director and surplus property deputy director, respectively, for the Reconstruction Finance Corp.

Reason for lack of a uniform formula, said Mr. Klagsbrunn, is that the surplus in plants and capital goods "still is among the things to come." Whereas the DPC owns some 1800 plants and projects, including those instances in which it has machinery in the plants of other owners, only 26 so far have been declared surplus—and 12 of these 26 properties comprise only land.

The 26 properties have been advertised for sale. In response to critical questions by Sen. Homer Ferguson (Rep., Mich.) who wanted to know why prospective buyers could not have the benefit of a specific sales formula, Mr. Klagsbrunn explained that the DPC needs more experience before it can set up a formula. "We cannot set a formula," he said. "Each case is different. We will talk with any company in terms of the fair value of a plant.

"We have disposed of one small plant in Binghamton, N. Y., the Square D plant, which we sold to the General Aniline Co., Ansco Film division. We advertised, we gave it publicity, in order that there would be free accession on the part of anyone who would be interested in the plant. We had a number of negotiations under way at all sorts of prices. We approached it on this basis: What would be today's reproduction cost of that plant, eliminating such wartime factors as overtime, as delays in holding labor while waiting for materials, excess costs of laying foundations during the winter time, when we wanted to save days and weeks as distinguished from the more normal methods of construction, and we arrived at what that plant, under present day materials and labor costs, under normal construction methods, would amount to.

"We found that the reproduction cost less depreciation for two years, and less an extra-expensive air-conditioning unit which was removed but for which extra building costs had to be incurred for the military purposes for which the plant was built—we found our present day cost would be $175,000 and that was the figure at which we sold it, for cash." The original cost, said Mr. Klagsbrunn, was $225,000, which really came to $215,000 after deducting $10,000 building expense to take care of the air-conditioning unit.

Advertise Plants for Sale

Of the 26 plants declared surplus, he added, only one other, a graphite plant in Alabama, consisting of small frame buildings, has been sold. Two other small ones, formerly operated by Eversharp and Symington-Gould, have been rented to other parties, but these rentals are on a month-to-month basis and the plants continue to be advertised for sale.

During testimony explaining the policy of the RFC in being willing to expedite disposal of surplus plants by granting liberal terms, Senator Ferguson found fault with the disposition to be more liberal with some buyers than others. The credit policy was explained as follows by Mr. Husbands: "If the borrower is a good individual, we would loan him approximately 60 to 75 per cent."

"You may loan one man 60 per cent and another 40?" asked Senator Ferguson.

"Well, the credit factors would have to be taken into consideration," replied Mr. Husbands. "When it comes to credit you can't set a percentage on which you will loan everybody. Our policy is to extend all the credit we safely can. It would depend on an analysis of the situation." Allowance of too liberal a credit, said Mr. Husbands would not be desirable. "If you loaned 90 per cent of the cost of the plant and the buyer did not pay any more, he could operate in there a year or two and you would be behind the game."

Rudolph Halley, the committee's general counsel, wanted assurances that companies in a favorable position under contract termination would not have an advantage over companies not so favored.

"You understand that, due to the tax setup, industry may or may not have large quantities of capital available to get these plants into operation, particularly that portion of industry which is not getting loans from the government for reconversion. Are you prepared," he asked, "to make special concessions in order to get plants into operation over and above what in peacetime or in normal times would be ordinary RFC credit principles?"

"Yes," replied Mr. Husbands, "but at the same time I wouldn't want to sell a plant on a basis that wasn't a true sale, so that it would fly back in our face. Then we would be worse off." Mr. Hus-

Sam H. Husbands, right, president of the Defense Plant Corp., recently outlined to a Senate committee his agency's thinking on surplus plant disposition. Others in the photo are Jesse Jones, center, Secretary of Commerce, and Earl L. Mefford, Goodyear Tire & Rubber Co., Akron, O. NEA photo

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the safest flyer in the world . . .

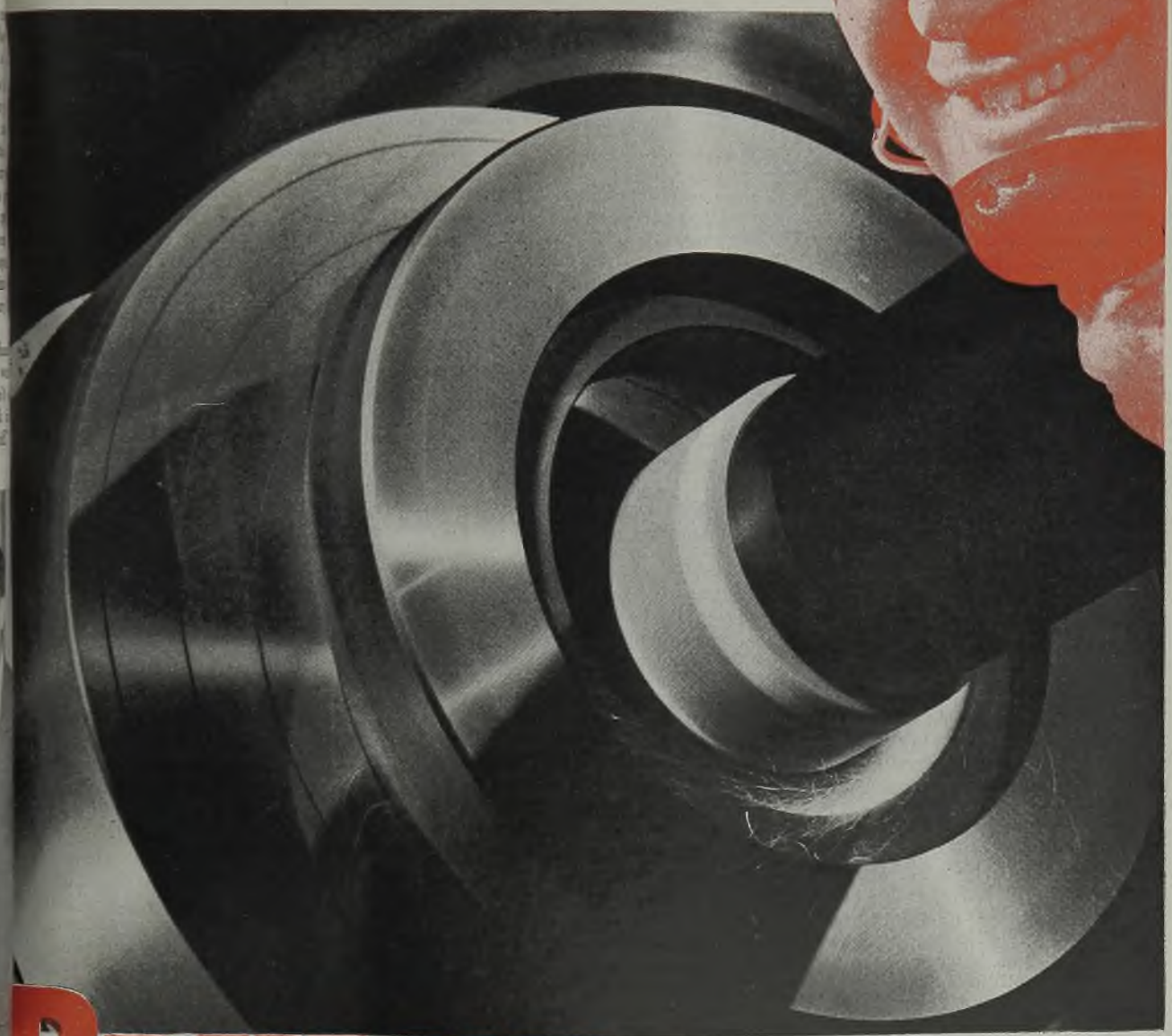
America spends more time, more money, more effort to protect the life of a flyer than any other country in the world . . . He is the unexpendable.

Into a single engine of his plane go as many as 84,000 individual manufacturing operations . . . to accuracies as fine as four-millionths of an inch.

And of all the machine tools in use by the aviation industry, none is more basic or more vital than the internal grinding machine.

Bryant engineers have helped the men of government and of industry to plan the most desperate and gigantic production program of all time . . . and they can help those same men in planning today for the peace that must be won after the war is won!

We invite you to send for a Bryant man today.



BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

bands concluded this part of the colloquy with assurances that the RFC would attempt to be more liberal on credit terms in disposing of surplus plants than it has been in conducting its normal business in the past. He cited the RFC policy by which machine tools can be bought at 15 per cent down and five years' credit. Asked whether the same terms would not be fair in selling real estate, he said that "you can sell a machine tool over again" but that "you might have a hard time selling a piece of real estate again." Mr. Husbands agreed that, in general, the RFC could grant liberal terms in selling surplus property but felt that this was a matter requiring careful consideration.

The DPC, said Mr. Klagsbrunn, has approached operators of government-owned plants with a view to encouraging the companies to exercise their options to buy those plants "but they are rather reluctant to express themselves at this time." Only 14 companies so far have exercised such options; included among them was the Bethlehem Steel Co. which bought plants while they were still under construction. Mr. Husbands said that building costs in 1941 were considerably less than they are today so that acquisition of plants built at this time, with depreciation deductions, in many instances is desirable.

But it was agreed that the DPC might just as well forget about the options at which plants built subsequently might be bought. It was revealed in this part of the examination that selling prices of such plants might be lower than the government's investment by a percentage considerably greater than the DPC now visualizes. Mr. Halley talked at some length about the possibility of lower construction costs after the war, when steel and other building materials possibly might be obtained at low prices; there was some controversy over this point, and Mr. Husbands remarked that no less an authority than Benjamin F. Fairless had predicted higher steel prices after the war. But Mr. Husbands agreed that all possibilities would have to be taken into consideration, and he felt that the policy certainly should not be one that would price surplus plants and buildings at a level which would cause them to be duplicated by industry in order to save money.

"It will become a horse-trading proposition," he said. "Once we have determined what the present-day replacement value is, then from there on we have to horse-trade. I frankly admit we wouldn't hold out for the last dollar if we thought we would be able to get out for a little cheaper price." The present-day valuation, he repeated, would be only the basis for negotiation. "Once we determine the present-day cost," he said, "then we could determine the cost a year from now by taking the factors which govern the construction of the plant."

Mr. Klagsbrunn cited some of the difficulties the DPC is up against. "We have had some plants, explosive plants, declared surplus, only to have them taken back again as vital in the war effort. We have advertised plants in the tank program as surplus, only to have them yanked back into production." The DPC also is handicapped by being unable to dispose of many plants while they still are being operated.

VERSATILE BULLDOZER: When American troops entered this French town, electric power had been cut off. A bulldozer was called up to operate the turntable of railroad yard. Signal Corps photo from NEA

Seeks Advance Information

"We had a conference with General Motors Corp., for example, about an airplane plant in Chicago. The Army does not know when this plant will be released." Will L. Clayton, surplus war property administrator, he said, is endeavoring to change this situation so that a plant may be sold while it still is in operation; the plan is to have the armed services supply advance information about cutbacks and terminations, and about their stand-by needs, so that the DPC can go ahead and sell the plants that will not be needed for stand-by purposes. Under such a system the DPC would be relieved of the disadvantage of selling a plant after it had become idle and its managerial and operating forces dispersed.

In the meantime, to acquire information for later use, the DPC is preparing prospectuses on plants that are likely to be declared surplus at a later date. "We have a crew of about 1000 engineers to figure replacement costs," said Mr. Klagsbrunn. "We have done that on 40 to 50 plants, including a coke plant, a shredded steel plant and a few casting plants. Being in operation, these plants are still on the confidential list and the information about them cannot be made public. Similar work now is under way on an additional 40 to 50 plants. The idea is to compile necessary information and avoid delays when these plants are declared surplus."

Mr. Klagsbrunn admitted that the DPC has all basic information about these plants as a result of planning and building them. He was asked whether necessary supplementary information could not be obtained by sending out a simple questionnaire instead of having two to four engineers spend anywhere from two to three weeks on each property. He said it was one matter to plan these plants and build them, and that it is an entirely different one to mobilize information that is necessary to sell them.

When a plant is declared surplus, said Mr. Klagsbrunn, all equipment that does not necessarily go with that plant is placed separately on the RFC surplus property lists, and the various procurement agencies are notified. For every four machine tools disposed of, he said three have gone back to government ownership, and the rest have been bought by contractors at the request of the Army and Navy. So far there has not been much interest on the part of private industry in acquiring surplus machine tools and equipment.

While there are no purchase options in contracts covering magnesium and aluminum plants, pipelines and synthetic rubber plants, said Mr. Klagsbrunn, DPC engineers are studying these plants with a view to ascertaining their peacetime possibilities. "We are going into magnesium plants, for example, with studies on improving the development of by-products, which would cut costs. We are studying the market for fabricated magnesium products. We have authorized research at several of our plants, with a view to obtaining information which

which to influence private purchasers to buy them."

Studies also are being conducted to see whether large plants, such as those making aluminum and magnesium, and B-24 bombers, can be adapted for multiple tenancy by small companies. In connection with this latter study, the RFC is considering the use of RFC loans, conditional sales agreements, time purchase methods, leasing to tide over the transitional unemployment period and the period of negotiation, as measures to encourage multiple tenancy or ownership of large plants.

Asked about cutting tools which the Army has just declared surplus in the Detroit area, Mr. Husbands said that Army contractors and subcontractors may sell cutting tools as a part of their contract termination procedure. But, he added, such sales are co-ordinated with the activities of RFC disposal agencies. "We have set up advisers to assist the armed services in the sale of contract termination inventory." Mr. Clayton, he said, has set up a price policy on termination inventory as follows:

Anything with a ready market must be sold at the market price; anything not having a ready market may be sold down to 75 per cent of cost, or of the customary market price, depending on its condition and other factors; the price may be adjusted downward when the property is to be put into immediate use; sales may be made on the basis of comparative bids when necessary.

Some 65 per cent of the material which the Army will declare surplus is in the nature of armament which would have to be converted into scrap for civilian use, Maj. Gen. Lucius D. Clay, director of materiel, Army Service Forces, told the committee. This does not include such items as tractors, construction equipment, trucks, engineering materials, also a lot of railroad and dock equipment which has been sent abroad. General Clay said the Army continues some production lines going even when surplus of the product has accumulated. For instance, it is producing more small arms ammunition than is needed. But this ammunition may be needed in greater quantities, said General Clay; if the lines were dismantled it would take months to get them going again. For insurance sake, therefore, the lines are kept going. In the same way, the Army is allowing contractors to continue production of antiaircraft guns which are not now needed but which may be needed in this war. The Army has large stocks of land mines and Model 1917 guns which it is holding in case of need.

Maj. Gen. O. P. Echols, assistant chief of air staff for materials and services, told the committee that the Army Air Forces so far have declared only some 3,000 planes obsolete and available for sale. It will add to this quantity in the next two to three months. Cutbacks, he said, prevent undue accumulation of obsolete models.

Recently announced cutbacks, he said, would result in some 294,000 fewer workers being employed in aircraft production as of July 1, 1945, than had been estimated. These workers will begin to be laid off in September and lay-offs will continue through next June. There were two reasons for stretching out this development over 11 months. One is the necessity of giving the War Manpower Commission enough time to find new jobs for the displaced workers. The other is that by reducing manufacture of certain planes immediately, the AAF is not building up a big inventory of units for which it might have no use in the near future.

The plants affected most by the cutbacks are Willow Run, the North American Dallas plant, the Higgins plant at New Orleans and the Republic plant at Evansville. Willow Run will be going only on B-29 bombers by the end of this year and will be operating at somewhat less than 50 per cent of capacity. Efforts to switch work to these plants from the West Coast so far have come to nothing, said General Echols.

Government Plans Meetings On Contract Termination

Meeting of subcontractors and smaller prime contractors will be held soon in all parts of the country under the joint sponsorship of the Smaller War Plants Corp. and the Army and Navy procurement officers. Purpose of the meetings is to interest contractors in making preparation for contract settlement and to convey basic information on the principal elements of contract termination procedures.

54 War Plants Receive Gold Star Renewal Awards

Fifty-four manufacturing companies now flying the U. S. Maritime Commission's "M" pennant received gold star renewal awards for continued achievement in production, the commission's board of production awards announced recently.

Companies receiving their first gold stars are: Combustion Engineering Co. Inc., Heine Boiler division, St. Louis; Condenser Service & Engineering Co. Inc., Scranton Pump division, Scranton, Pa.; Graham Mfg. Co. Inc., New York; Kennedy Valve Mfg. Co., Elmira, N. Y.; National Radiator Co., Johnstown, Pa.; Oil Well Supply Co., Oswego, N. Y.; Stetson-Ross Machine Co., Seattle; and Joslyn & Ryan, Naval Architects, San Francisco.

Companies receiving their second gold stars are: Buckler-Chapman, Portland, Oreg.; R. D. Cole Mfg. Co., Newnan, Ga.; Gunderson Bros., Portland, Oreg.; Lionel Corp., Irvington, N. J.; E. H. Scott Radio Laboratories Inc., Chicago; W-K-M Co. Inc., Houston, Tex., and Webster-Brinkley Co., Seattle.

Companies receiving their third gold stars are: Babcock & Wilcox Co., Barberton, O.; Buckeye Iron & Brass Works, Dayton, O.; Columbia Steel Co., Pittsburg, Calif.; Colvin-Slocum Boats Inc., New York; Dri-Steam Products Inc., New York; Eastern Cold Storage Insulation Co., New York; Edward Valve & Mfg. Co. Inc., East Chicago, Ind.; Edwards & Co. Inc., Norwalk, Conn.; Fort Pitt Steel Casting Co., McKeesport, Pa.; Jenkins Brothers, Bridgeport, Conn.; Lewis Bolt & Nut Co., Minneapolis; John Lucas & Co. Inc., Philadelphia; Maine Steel Inc., South Portland, Me.; Mercer Tube & Mfg. Co., Sharon, Pa.; Mine Safety Appliances Co., Pittsburgh; National Tile & Marble Corp., New York; Paxton-Mitchell Co., Omaha, Nebr.; Pitcairn Co., Barberton, O.; Radiomarine Corp. of America, New York; Simplex Wire & Cable Co., Cambridge, Mass.; W. & J. Sloane, New York; Socony Paint Products, Division of Socony-Vacuum Oil Co. Inc., New York; Sterling Steel Foundry Co., Braddock, Pa.; Ed. Steves & Sons, Steves Sash & Door Co., San Antonio, Tex.; Sumner Iron Works, Everett, Wash.; L. Theiss & Sons Corp., Maspeth, N. Y.; Trill Indicator Co., Pittsburgh; Turl Iron & Car Co. Inc., Newburgh, N. Y.; Union Steel Pump Co., Battle Creek, Mich.; and Kelvin & Wilfrid O. White Co., Boston.

Companies receiving their fourth gold stars are: American Hoist & Derrick Co., St. Paul; Combustion Engineering Co. Inc., Hedges-Walsh-Weldner division, Chattanooga, Tenn.; Filer & Stowell Co., Milwaukee; Hopemann Brothers Inc., New York; Kerotest Mfg. Co., Pittsburgh; Koppers Co., Bartlett Hayward division, Baltimore; National Malleable & Steel Castings Co., Sharon, Pa.; General Machinery Corp., Hamilton, O., and Joshua Hendy Iron Works, Sunnyvale, Calif.

AWARDS . . .

Consolidated Engineering Corp., Pasadena, Calif.

Herschede Hall Clock Co., Cincinnati.

Kahlenberg Bros., Two Rivers, Wis.

May Oil Burner Corp., Baltimore.

Moorlane Co., Tulsa, Okla.

Production Plating Works Inc., Lebanon, O.

Republic Stamping & Enameling Co., Canton, O.

U. S. Industrial Diamond Corp. Adamant Tool Company division, Bloomfield, N. J.

Henry Weis Mfg. Co. Inc., Elkhart, Ind.

Ace Mfg. Corp., Philadelphia, receives third award.

Ajax Iron Works, Corry, Pa., "M" pennant.

Crane Co., Chicago, "M" pennant.

Farrel-Birmingham Co. Inc., Ansonia, Conn., "M" pennant.

Lidgerwood Mfg. Co., Elizabeth, N. J., "M" pennant.

Reliance Electric & Engineering Co., Cleveland, "M" pennant.

Sperry-Gyroscope Co. Inc., Marine division, Brooklyn, N. Y., "M" pennant.

Electric Boat Co., Naval division, Bayonne, N. J.

Wales-Strippit Corp., North Tonawanda, N. Y.

Westinghouse Electric & Mfg. Co., Steam Division and manufacturing and repair plant, Philadelphia, receive fourth renewals.

Westinghouse Electric & Mfg. Co., Merchant Marine Division, Lester, Pa., adds second star to "M" pennant.

Pettibone Mulliken Corp., Chicago, adds second star to "E" pennant.

Tool Steel Order Revoked; Some NE Specifications Eliminated

Monthly filing by each tool steel producer of his production schedule on form 949 and purchasers' statements accompanying orders are no longer required. Emergency specifications for hot-rolled flat carbon steel bars have been eliminated

TWO orders directly affecting steel producers' operations were revoked by the War Production Board last week. These orders governed purchases of tool steel and national emergency specifications for hot-rolled flat carbon steel bars.

Requirements for tool steel have decreased to a point where the controls and reports which M-21-h called for are no longer necessary, according to WPB. The revocation stated that the action does not affect any liability which may have been incurred because of past operation under order M-21-h.

The revocation eliminates the previous requirements for the monthly filing by each producer of his production schedule on form WPB-949 and for a purchaser's statement with each order for tool steel placed with a producer.

M-21-h had provided that every purchase order for tool steel placed with a producer include a statement to the producer and to WPB that it was an order for "tool steel" and the steel ordered would be used only for the manufacture of tools for use in mechanical fixtures for cutting, shaping, forming or blanking of material, or for precision gages.

National emergency specifications for steel products were established by WPB in order to get maximum production from steel mills during the war period by reducing the overall number and specifications of products being made. However, while other specifications with respect to hot-rolled bars will remain in effect, it has been found that the efficiency of mill operations will not be impaired by removing those applicable to flat bars.

Clarifies Procedure for Pricing Die Castings

Office of Price Administration issued a statement last week clarifying that section of regulation No. 6 which provides that a die casting is not considered "the same die casting" as one sold previously if differences in design or specification, including quantity or rate of delivery, result in differences per 1000 die castings of 5 per cent or more in total cost of manufacture. Thus, if a customer changes the quantity orders to such an extent that its cost per 1000 pieces is 5 per cent more than the cost per 1000 of that die casting when sold originally, the new order may be considered a new die casting and may be priced by use of the seller's pricing formula. In order to make the comparison, the costs of both orders must be figured in accordance with the seller's pricing formula, including setup charges if used.

Authorizations Issued for Truck and Trailer Output

Authorizations have been issued by WPB for production in the first quarter of 1945 of 39,512 medium, 15,677 heavy and 373 off-the-highway commercial trucks and truck tractors and for production in the first half of 1945 of 249 low-bed heavy hauler trailers, 617 petroleum tank trailers, 130 milk tank trailers, and 1501 pole trailers.

Sharp Cut in Aluminum Output Ordered by WPB

Aluminum production in government-owned plants in California, Washington, Oregon, Arkansas, Tennessee, North Carolina, and New York will be reduced 30 million pounds of ingots monthly by orders issued last week by the War Production Board. This will cut monthly output to slightly less than one-half of the 188 million pounds produced in the peak month last fall.

In addition, Aluminum Co. of America will curtail operations at several of its plants in accordance with an agreement with Defense Plant Corp.

Ground Keywork Added to Price Regulation 136

Ground keywork, such as cocks and stops, have been added to coverage of price regulation No. 136 when sold by the manufacturer to producers and resellers of machines and parts, manufacturers and resellers of farm equipment and manufacturers of automotive parts. Sales of ground keywork by persons engaged in the business of selling machines are also covered by the regulation.

Sales of metal hatch covers at manufacturers' and wholesalers' levels also have been brought under its coverage.

Manufacturer's Silver Quota Raised by WPB

A silverware manufacturer has been authorized by WPB to purchase and use an amount of domestic silver in excess of his quota as established under order M-199. The precedent set up by this action is of interest to any maker of articles under list B of the order who holds stocks of "high-priced" foreign silver.

WPB Amends Limitation Orders To Bring Provisions in Line with New Spot Procedure

TWENTY-NINE limitation orders, governing production of consumers durable products, have been amended to indicate specifically in the orders themselves that the products they cover are subject to the "spot authorization" procedure issued on Aug. 15, the War Production Board has announced.

This action removes provisions in the orders that might appear to conflict with priorities regulation No. 25 which contains the rules governing the "spot procedures."

The orders that have been amended, together with the products which they cover are:

Domestic laundry equipment (L-6); umbrella frames (L-36); wood case and other non-mechanical pencils and pen holders (L-227-b); pen nibs (L-227-a); flatware and hollow ware (L-140-b); metal hair pins and metal bob pins (L-104); dry cell batteries and portable electric lights operated by dry cell batteries (L-71); golf clubs (L-93); bicycles and bicycle parts (L-52); cast iron ware (L-30-c); enameled ware (L-30-b); galvanized ware and non-metal coated metal articles (L-30-a); domestic electric ranges (L-23-b); vending machines merchandise (L-27); lawn mowers (L-67); domestic vacuum cleaners (L-18-b); domestic ice refrigerators (L-7-c); miscellaneous cooking utensils and other articles (L-30-d); electrical appliances (L-65); electric irons (L-65-a); photographic and projection equipment, accessories and parts (L-267); fountain pens and mechanical pencils (L-227); metal household furniture (L-62); musical instruments (L-37-a); beds, bed springs, mattresses and dual sleeping equipment (L-49); portable electric lamps and shades (L-33); church goods (L-198); alarm clocks (L-275); and domestic and commercial electric fans (L-176).

Persons may apply for "spot authorization" to produce these products whether they have or have not previously produced the particular product they desire to make. Applications should be filed with the WPB field office nearest to the plant in which the proposed production will be undertaken.

At present, no substantial increase in production of these items is expected.

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

MRO SUPPLIES: Any person assigned a maintenance, repair and operating supplies symbol (MRO) and rating under CMP regulation No. 5 may use such rating to obtain materials to install or relocate machinery or equipment. Where construction is involved, persons may obtain materials needed for the installation or relocation of machinery or equipment at direction 2 to order L-41 permits them to install or relocate without obtaining an authorization from WPB. If construction is not involved, materials valued up to $500 may be obtained to install any piece of machinery or equipment rated or authorized by WPB.

HEATING EQUIPMENT: Manufacturers of extended surface heating equipment are required to make a new report on the models and sizes of equipment they wish to produce. The reports are due by Sept. 4.

LIGHTING FIXTURES: Manufacturers and assemblers of fluorescent lighting fixtures and electrical wholesalers selling ballasts and transformers for such fixtures must file a report by Sept. 15 on form WPB-3894 stating ballast and transformer inventories, the amount used and the amount on order for the year 1944. Only those who on Sept. 1 had in inventory 100 or more units of all types of ballasts and transformers for such lighting fixtures; or who used 500 or more units in 1944; or who had on order for delivery 500 or more units in 1944 are required to file the reports.

ELECTRONIC EQUIPMENT: Purchase orders for electronic equipment accompanied by either a consumer's certificate or a supplier's certificate are unrated orders and carry no priority by virtue of the certificate.

HAIR CLIPPERS: Authorization for the manufacture of 15,000 electric hair clippers for the armed services has been granted to five companies. The companies and the numbers of units they are authorized to produce are: John Oster Mfg. Co., Racine, Wis., 7000; Allover Mfg. Co., Racine, 3500; Wahl Clipper Co., Sterling, Ill., 2320; Andis Clipper Co., Racine, 1000; and the Racine Universal Motor Co., 180.

GAS TANKS: Authorizations for consumers and dealers to purchase liquefied petroleum gas tanks must be requested on forms WPB-809, revised, or GA-855, and the original authorization, as well as a certified purchase order, must be presented to the tank manufacturer.

L ORDERS

ENAMEL WARE: Production of the following domestic and hospital enamel ware may be resumed: Colanders, baby bottle sterilizers, sauce pans, infants' bath tubs, funnels, baby mangers (two sizes; all other items above one size and one model per manufacturer), immersion arm baths, iodine cups, forceps jars, urinals, graduates (a type of measure). (L-30-b)

CONSTRUCTION: Any person now may install, without WPB approval under L-41, any processing machinery or equipment, whether approved on a special form or not, and any single piece of machinery or a group of related pieces of any other kind of machinery or equipment approved by WPB on a special application form if the total cost of the entire installation, including the cost of the equipment, does not exceed $25,000 and if the cost of the job, counting the cost of the equipment, does not exceed $5000. If the cost of the installation exceeds the designated cost limits permission under L-41 is required even though the equipment has been obtained on form WPB-541 or WPB-542. These regulations now apply to any factory or industrial plant, regardless of productive floor area. (L-41)

PETROLEUM GAS: Distributors and marketers of liquefied petroleum gas now may use materials for the maintenance and repair or construction of structures required in the operation of these businesses by obtaining authorization under order L-86, which is administered by the Petroleum Administration for War. They may use the automatic preference ratings provided in preference rating order P-98-b. Liquefied petroleum gas distributors and marketers who wish to build new structures must apply to the PAW for permission to use materials for this purpose by filing a PAW form 30. (L-86)

STEAM TURBINES: Restrictions have been lifted on the use of auxiliaries and special equipment in the manufacture of turbines. Manufacture, delivery and installation of steam turbines for land use remain subject to all other applicable WPB regulations and orders. (L-154)

SUN GLASSES: Copper-base alloys obtained from idle or excess inventories under priorities regulation No. 13 now may be used in the manufacture of sun glasses. (L-238)

RECTIFIER TUBES: Limitation order governing the manufacture of rectifier tubes has been revoked, but production is expected to remain at about the present level and will continue to be controlled through the allotment of materials under the Controlled Materials Plan. Each manufacturer will continue to apply to WPB for materials on form CMP-4-b and will be allotted materials quarterly in accordance with need. (L-264)

DENTAL BURS: Manufacturers of dental burs now must report operations and proposed shipping schedules on form WPB-3000. Starting Sept. 10, it must be submitted on or before the tenth day of each month. Diamond impregnated points or discs no longer are covered under the order. (L-295)

M ORDERS

SOLDER: Permission to use solder having up to a 50 per cent tin content by weight has been granted for the manufacture, repair and maintenance of refrigeration equipment, radio and radar equipment, and for the manufacture and repair of any type of indicating, recording, measuring or controlling instruments and their associate control valves, excluding manufacture and repair of gas meters. Solder containing 35 per cent tin is permitted for manufacture and 38 per cent for repair of gas meters. Distributors of solders and babbitt metal must now certify to the manufacturer that he will not resell to any user unless he has received the certificate from the user as required by the order. (M-43)

TRANSFORMERS: It is no longer necessary to file applications for authority to purchase transformers smaller than 250 kilovolt-amperes, except liquid-filled and dry-type power or distribution transformers smaller than 250 kilovolt-amperes having special features, design characteristics or accessories as defined in instructions on form WPB-2648. (M-293)

INDEX OF ORDER REVISIONS

P ORDERS

CHEMICALS: Dollar quota restrictions have been lifted from the purchase of chemicals for laboratory use. Persons in the business of conducting scientific or technological investigation and experiments are entitled to an AA-2 rating to buy material to be used in such work. Also included in the AA-2 category are distributors and producers of reagent chemicals. AA-1 preference ratings for reagent chemicals are assigned to laboratories that hold a serial number under order P-43 and to Army and Navy laboratories. (P-135)

HOUSING: Use of the regular order P-98-b maintenance and repair procedure is permitted for the upkeep of houses owned by petroleum operators in all branches of the industry and occupied by their employes. A similar privilege, providing for a special material priority, is extended to housing owned and occupied by employes of petroleum operators if the housing is on or adjacent to an oil or gas lease.

For the construction of housing on or adjacent to a lease, a petroleum operator will use the regular production rating of order P-98-b. An employe will apply for authority to construct housing by writing to the PAW district office for the district in which the proposed housing is to be erected.

Operators engaged in pipeline operations must obtain approval to use materials for housing by filing PAW form 30 with the appropriate district office. Housing construction by operators in refining or petroleum marketing as well as production housing in urban areas will be handled jointly by PAW and the National Housing Agency. For these types of housing, operators will file form WPB-2896 with the appropriate PAW district office. (P-98-b)

PRICE REGULATIONS

HOT WATER HEATER CONTROLS: An increase of 9 per cent in manufacturers' prices of domestic automatic hot water heater controls on sales to manufacturers of direct-fired domestic automatic hot water heaters has been granted. (No. 188)

New OPA Boards of Review To Consider Protests

Boards of review have been established by the Office of Price Administration to consider protests to maximum price and rent regulations and orders and to make recommendations to the price administrator concerning the protests.

Reserve Stocks Held Under WPB Program Re-examined

All directors of the War Production Board divisions have been asked to re-examine their stockpile and public purchase programs and to review their estimates of proper reserve stocks for each program. A safe reserve stock is regarded generally as one equaling either three months' total requirements or six months' import requirements, whichever may be larger.

MEN of INDUSTRY

N. J. CARBIS

THOMAS McLEAN JASPER

N. J. Carbis has been named special railroad representative for Champion Rivet Co., Cleveland. Mr. Carbis has had 30 years experience in the railroad field, part of which time was spent as general boiler foreman for the Baltimore & Ohio railroad.

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James K. Russell has been named manager of the branch office which Eimco Corp., Salt Lake City, Utah, has opened in the Paul Brown building, St. Louis.

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A. J. M. Baker, formerly manager of the Crocker-Wheeler division, Joshua Hendy Iron Works, Ampere Station, N. J., has been named executive vice president and general manager, E. W. Bliss Co., Brooklyn, N. Y.

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E. D. Almy has been appointed manager, Crocker-Wheeler division, Joshua Hendy Iron Works, Ampere Station, N. J., and **Harry Grunetti** has been named to succeed Mr. Almy as assistant general manager of Joshua Hendy Iron Works. **Robert Mann** becomes general superintendent of Joshua Hendy and **Clifford Sayre** has been named assistant general superintendent.

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Thomas P. Gorter, vice president, Pullman-Standard Car Mfg. Co., Chicago, has been appointed sales director of transportation equipment for the United States, Canada and Mexico, and also has been elected a director of Pullman-Standard Car Export Corp.

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Harry L. Buck, formerly marine application engineer, has been appointed assistant to the president, I-T-E Circuit Breaker Co., Philadelphia.

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C. K. Mead, sales manager, General Electric Co.'s Resin and Insulation Materials division, Bridgeport, Conn., has announced the following reorganization of the field force for glyptal alkyd resins: **F. M. Hastings** will be in charge of the New York area with offices at 570 Lexington avenue, New York; **C. H. Gross** will handle the Atlantic Seaboard District except for the New York area, with headquarters in Schenectady, N. Y.; **P. E. Doell** is in charge of the East Central District, making his headquarters at 1966 Woodland avenue, Cleveland; **J. R. Reid** and **R. C. Reid,** in charge of the Central District, will have their offices at 840 South Canal street, Chicago. The Paul W. Wood Co. of San Francisco and Los Angeles represents glyptal on the Pacific Coast, and **J. E. Russell** acts in a similar capacity in the states of Arkansas, Louisiana, Oklahoma and Texas.

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Thomas McLean Jasper, formerly associated with A. O. Smith Corp., Milwaukee, as director of research, has been appointed technical and research director for General American Transportation Corp., Chicago.

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Albert H. Charlton, previously sales manager for the Philadelphia area, Reynolds Metals Co. Inc., Richmond, Va., has been named eastern sales manager, Aluminum division.

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O. L. Earl has been appointed vice president and member of the board, Acme Aluminum Foundry Co., Chicago. He will direct sales and sales development of new products for the company. For the past seven years Mr. Earl has been general sales manager of Mullins Mfg. Corp., Salem, O.

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H. C. Kenyon has been appointed general sales manager, Inland Rubber Corp., Chicago, subsidiary of Minnesota Mining & Mfg. Co., St. Paul.

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Thurlow E. McBride has been elected vice president and treasurer, American Engineering Co., Philadelphia.

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Joseph A. Zerkel, for the past ten years alloy metallurgist at the Indiana Harbor plant of Youngstown Sheet & Tube Co., Youngstown, O., has been appointed metallurgical engineer of Milwaukee Forge & Machine Co., Milwaukee.

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Stephen Van R. Spitler, formerly president of W. F. Jackson Co. Inc., an engineering organization, and for the past two years chief of the Castings and Fabricated Products Section, Iron and Steel Branch, OPA, has been appointed assistant to the president, Ross-Meehan Foundries, Chattanooga, Tenn.

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Robert F. Mehl, director of the metals research laboratory and head of the department of metallurgical engineering, Carnegie Institute of Technology, Pittsburgh, has been awarded the honorary degree of doctor honoris causa by the Escola Politecnica of the University of Sao Paulo, Brazil, where he recently completed a four months' lecture series. Mr. Mehl also received a gold medal for his assistance in organization of the first Brazilian metallurgical society, the Associacao Brasileira de Metais.

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E. R. Mertz has resigned as chief metallurgist, Bendix Aviation Corp., North Hollywood, Calif., to organize the Mertz Heat Treating Co., Van Nuys, Calif., of which he is owner and general manager.

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Horace S. Kircher has been placed in charge of the recently-opened office in Providence, R. I., of Edgar T. Ward's Sons Co., Columbia Steel & Shafting Co. and Summerill Tubing Co.

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James L. Beebe, member of the law firm of O'Melveny & Myers, Los Angeles, has been elected a director of Plomb Tool Co., Los Angeles.

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H. D. Mallison has been appointed manager of bus sales in the southern division, with headquarters in Atlanta, Ga., by Mack International Motor Truck Corp., Long Island City, N. Y.

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W. Douglas Walker has been named assistant to **Carl Schlesinger,** executive vice president of Pollak Mfg. Co., Arlington, N. J.

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Victor F. J. Tlach, until recently president, Darwin & Milner Inc., tool steel warehouse, Cleveland, has been appointed consultant and special representative of the sales department of Latrobe Electric Steel Co., Latrobe, Pa. Mr. Tlach, who has made important contributions to the tool steel industry through his research and development of cobalt chromium steels, will make his headquarters at Latrobe's Cleveland office.

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H. W. Christoffers, L. T. Dupree and **R. B. Schneider** have joined the staff of Arthur D. Little Inc., Cambridge, Mass., industrial research organization.

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A. Felix du Pont, vice president of E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., has retired as a member of the company's finance committee, but continues to serve as a board member. **Dr. Fin Sparre,** director of the development department, also has retired, retaining membership on the board. **Edward B. Yancey,** until now general

ager of the explosives department, has been elected a vice president and member of the executive committee and **Emile F. du Pont**, production director of the Nylon division and a company director, was elected to succeed A. Felix du Pont on the finance committee. **Ernest K. Gladding** will succeed Dr. Sparre as director of the development department and **William H. Ward** succeeds Mr. Yancey as general manager of the explosives department. **T. C. Davis**, former assistant comptroller, has been named assistant treasurer to head the treasury division of the treasurer's department.

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Ellsworth S. Gray, former assistant professor of mechanical engineering, University of Missouri, has been named chairman of the department of mechanical engineering, Kansas University.

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H. L. Schaller of Miami, Fla., has been re-elected president of the American Society of Sanitary Engineers. Other officers are: **J. R. Walker**, Waterbury, Conn., secretary, and **T. M. Dugan**, McKeesport, Pa., treasurer.

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J. D. **Loftis** has been appointed eastern district manager in charge of the new office opened by Baldwin Locomotive Works, Eddystone, Pa., at 1152 Broad Street Station building, Philadelphia.

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Three executives of the Weatherhead Co., Cleveland, recently elevated to vice presidencies are: **H. Church**, in charge of sales; **George H. Hufferd**, in charge of engineering, and **Robert P. Gibson**, in charge of automotive sales. **Morris H. Wright** has been appointed assistant to the president.

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Alfred **T. Reynolds** has been appointed chief accountant of parent and subsidiary companies of Thermoid Co., Trenton, N. J.

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Frank E. Tighe and **Forrest S. Mabry** have been awarded the Westinghouse Electric & Mfg. Co.'s Order of Merit for their work in designing and manufacturing radar. Mr. Tighe is superintendent of the Lansdowne, Md., plant of the Radio division, and Mr. Mabry is section engineer of the Radio division.

WILLIAM H. KRAMER JR.

HENRY G. TARTER

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William H. Kramer Jr. has been named production manager, Stover Lock Nut & Machinery Corp., Easton, Pa. Previously he had been assistant to the production manager, Compressor division, Ingersoll-Rand Co., New York.

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Paul Hichborn has been appointed retail merchandising manager of Bendix Home Appliances Inc., South Bend, Ind. Three new divisional sales managers are: **W. A. Becker**, Midwest; **C. J. Laufersweiler**, West Coast, and **C. D. Mitchell**, Southeast.

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Maj. Herbert H. Blizzard has been named chief of the contract termination section of the Army Air Force Materiel Command in Milwaukee.

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Pitney-Bowes Postage Meter Co., Stamford, Conn., has announced the following appointments in its sales organization: **E. M. Davis**, eastern sales manager, with headquarters in New York; **W. L. Frew**, southern sales manager, Atlanta, Ga., and **J. A. Lamplugh**, western sales manager, Chicago. **H. M. Nordberg** has been appointed assistant to **W. R. Greenwood**, vice president in charge of sales.

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Henry G. Tarter has been appointed chief engineer of the aircraft carburetor engineering department, Bendix Products division, Bendix Aviation Corp., South Bend, Ind.

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J. R. **McMahon**, formerly manager of priorities, Pullman-Standard Car Mfg. Co., Chicago, has been appointed to the newly-created post of supervisor of stores.

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Edward A. Willson has been named resident supervisor of the synthetic rubber laboratories operated by B. F. Goodrich Co., Akron, O., at Kent State University, Kent, O.

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Carl H. Odell has been appointed assistant manager of the Instrument division, Thomas A. Edison Inc., West Orange, N. J.

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Dr. William A. LaLande Jr., formerly director of research, Attapulgus Clay Co., Philadelphia, has joined the research and development department of Pennsylvania Salt Mfg. Co., Philadelphia. Dr. LaLande will have immediate charge of the Research division.

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Leo F. Dalton, formerly chief metallurgist of Symington-Gould Corp., Rochester, N. Y., has become associated with Great Lakes Foundry Sand Co., Detroit, as metallurgist and sales engineer.

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B. T. Roe, manager of distribution, Crosley Corp., Cincinnati, will leave shortly to join the J. N. Ceazen Co., Los Angeles, as vice president and general manager.

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C. C. Franck has been appointed manager of land turbine engineering, Steam

MAURICE H. HOBBS

Who has been named manager, engineering department, Switchgear and Control division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., reported in STEEL, July 31, p. 61.

G. A. MARKS

Who has been appointed assistant works auditor, Gary Works, Carnegie-Illinois Steel Corp., Chicago, noted in STEEL, Aug. 28, p. 72.

division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Other appointments in the Steam division are: **L. C. Fletcher**, steam application engineer, marine section; **S. W. Schmidt**, supervisor of subcontracting, and **J. R. Thomas**, superintendent of fabricating and welding.

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Dr. Walter M. Mitchell, recently appointed director of research for the Mack Truck organization, is located with Mack Mfg. Corp., Plainfield, N. J., rather than at the corporation's Long Island City offices as stated in STEEL, Aug. 7.

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Robert E. Lewis, formerly treasurer of American Steel & Wire Co., Cleveland, has been elected president of Cleveland Wire Spring Co., Cleveland, succeeding **James W. Campbell**, who is retiring. Mr. Campbell continues as a director of the company.

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Leonard S. Hobbs has been elected vice president for engineering, United Aircraft Corp., New York, and **Wright A. Parkins** has been named engineering manager of the company's Pratt & Whitney division. Mr. Hobbs also was appointed a member of the operating and policy committee.

RAY P. FARRINGTON

Who has acquired controlling interest in the W. F. Potts Son & Co. Inc., Philadelphia, becoming board chairman, as announced in STEEL, Aug. 28, p. 54.

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Fred L. Curtis has been appointed manager of the sales engineering department, Norton Co., Worcester, Mass., and **Fred W. Grant** has been named merchandising engineer. **Paul H. Carlson** has been made abrasive engineer in Milwaukee, and **E. C. Willey** becomes abrasive engineer in the Moline, Ill., area.

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Alexis J. Diakoff, formerly head of the mechanical engineering department, University of North Dakota, has joined American Locomotive Co., New York, as consulting engineer of the diesel engine department of the Schenectady, N. Y., plant.

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John Steel, writer, engineer and specialist in the field of electronics and mechanics, has been appointed account executive on the staff of Florez, Phillips & Clark, Detroit marketing agency. For a time Mr. Steel served as advertising manager of Weltronic Corp., Detroit.

OBITUARIES . . .

Frank E. Hulett, 68, engineer who revolutionized dock-loading methods 18 years ago when he invented a loading pier that would do the work of 118 men, and president of the Hulett Engineering Co., Cleveland, died Aug. 27 in that city. Many years ago Mr. Hulett collaborated with his father in designing a device for unloading cargo which was patented and is still in use as the Hulett unloader. He worked with his father at the Wellman, Seaver, Morgan Co., Cleveland, developing labor-saving machinery, then 30 years ago went into business for himself. With the invention of his $4,500,000 loading pier in 1926 he received national recognition.

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Harry W. Bailey, 55, for the past five years purchasing agent of the Cleveland Diesel division, General Motors Corp., Cleveland, died there Aug. 23. For 20 years prior to his association with General Motors, Mr. Bailey was purchasing agent for White Motor Co., Cleveland.

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Elmer J. St. Clair, 65, an expert in coke plant operation and general foreman of the coke plant at Cleveland of Republic Steel Corp., died Aug. 26 in that city.

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Mortimer E. Cooley, 89, dean of the University of Michigan College of Engineering from 1904 until 1928 and dean emeritus of the college since then, died Aug. 25 in Ann Arbor, Mich. One of the most prominent engineers of his time, Mr. Cooley was graduated from the United States Naval Academy in 1878. He served with the Navy for several years and in 1918 joined the University of Michigan as professor of mechanical engineering. In 1921 he was chosen to succeed Herbert Hoover as president of the American Engineering Council of the Federated American Engineering Societies, a position he retained for three years. He was president of the American Society of Mechanical Engineers in 1919.

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William E. Wehr, vice president of the Wehr Steel Co., Milwaukee, died there Aug. 24. In 1910 he and three brothers organized the steel company which bears their name.

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Dr. Gosta Phragmen, 46, assistant professor of metallurgy at the University of Technology, Stockholm, Sweden, died Aug. 21. He was a recipient of the Robert Hunt Gold Medal of the American Institute of Mining and Metallurgical Engineers in 1940.

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Walter T. Jameson, 64, general sales manager of the valve division of Ohio Brass Co., Mansfield, O., died recently.

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Harold C. Middleton, 51, sales representative in Philadelphia for Caterpillar Tractor Co., Peoria, Ill., died Aug. 21 in Camden, N. J.

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Ralph T. Lichtenstein, 54, eastern district manager of Signode Steel Strapping Co., Chicago, died Aug. 19 in Philadelphia.

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Rupert Kennedy Stockwell, 62, who was in charge of the Pacific Coast territory for Robins Conveyors Inc., Passaic, N. J., died in Oakland, Calif., Aug. 24. From 1901 until 1911 Mr. Stockwell served as designing engineer and construction engineer with numerous companies, joining Robins in the latter year as a draftsman. He left that company shortly to become chief engineer for a project of the Braden Copper Co., New York, at Rancagua, Chile. Returning to Robins in 1917 he became sales manager for a short period before going abroad in 1919 to open the Robins office in London. Fourteen years later he left England to spend four years in charge of sales for Robins Conveyors in Shanghai.

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Joseph M. Volzer, 50, for 25 years a metallurgist with Republic Steel Corp., Cleveland, died while on a business trip in Evansville, Ind., Aug. 23.

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Harry L. Richman, 54, senior partner in the firm of I. Richman & Co., scrap iron and steel dealers, died in Washington, Pa., Aug. 23.

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Patrick J. Durr, 59, district sales manager at Detroit for Russell, Birdsall & Ward Bolt & Nut Co., Port Chester, N. Y., died in Detroit Aug. 24. A native of Ireland, Mr. Durr worked in earlier years in Birmingham, England, emigrated to this country, and eventually became associated with Russell, Birdsall & Ward, opened the company's Detroit office in 1923.

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David W. Bowen, 76, president of the Puget Sound Sheet Metal Works, Seattle, died Aug. 21 in that city. Mr. Bowen, who organized the sheet metal company in 1900, was prominent in civic and political affairs in Seattle, serving as acting mayor for a period and for several years as president of the city council.

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John P. Moses, 73, formerly manager of railroad sales for Joseph T. Ryerson & Son Inc., Chicago, died Aug. 18 in that city.

Braeburn Alloy Seventh Firm To Join Continental

Management will remain intact, with C. A. Bolles as chairman, and T. H. McGraw Jr. as chief executive

BRAEBURN Alloy Steel Corp., Braeburn Pa., high speed steel producer, has become the seventh company to join the Continental Industries Inc., New York investment and management company with annual sales of approximately $75 million.

In announcing purchase of all the Braeburn Alloy Steel Corp. stock, Chester A. Bolles, chairman of the board for Continental, said that the management of Braeburn Alloy will remain intact under the leadership of T. H. McGraw Jr., who will be chief executive in charge of manufacturing operations and sales. Mr. Bolles will become chairman of Braeburn.

"Like most of the companies in the Continental group, the Braeburn Alloy Steel Corp. has comparatively few reconversion problems," Mr. Bolles declared. "It has an excellent postwar future and will sell the same products it now manufactures."

Among the other companies bought by Continental are: Franklin Machine & Foundry Co., Providence, R. I.; A. W. Harris Oil Co. of Providence, R. I.; Kensington Shipyard & Dry Dock Corp., Philadelphia; Walsh Holyoke Steam Boiler Works, Holyoke, Mass.; Liberty Motors & Engineering Corp., Baltimore, Md. and J. Sullivan & Sons, Philadelphia.

T. H. McGraw Jr., left, will continue as chief executive of the Braeburn Alloy Steel Corp., recently acquired by Continental Industries Inc. Chester A. Bolles, right, will be chairman of both companies

BRIEFS . . .

Demco Tool Service Inc., Glendale, Calif., has been organized by a group of Detroit machine and cutting tool manufacturers headed by Russell W. Luzius. Companies represented are Michigan Tool Co., Colonial Broach Co., Detroit Tap & Tool Co., Tungsten Carbide Tool Co., Colonial Bushings Inc., New Method Steel Stamps Inc., all of Detroit, and Genesee Tool Co., Fenton, Mich.

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Frostrode Products, Detroit, has moved to a larger plant at 19929 Exeter to meet increased demands for industrial refrigeration equipment by industry.

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Meehanite Metal Corp., New Rochelle, N. Y., announces a contract has been completed with the Jay Engineering Works Ltd., Parganas, India, for manufacture of Meehanite castings.

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Ruth Gerth, George Kosmak, Alexander Kostellow, Rowena Reed, industrial designers and architects, New York, have joined forces in a new company with headquarters at 228 East Sixty-first street, New York.

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Acme Pattern & Tool Co., Dayton, O., announces its corporate name has been changed to Acme Aluminum Alloys Inc.

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Allied Radio Corp., Chicago, has been appointed distributor for Littelfuse Inc.

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MetalFusion Corp. of America, Chicago, has become a subsidiary of Cook Electric Co. William A. Ziebell has been appointed manager of the MetalFusion Corp.

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Kerner Incinerator Co., Milwaukee, has sold its name, good will and buildings to the Morse-Boulger Destructor Co., New York.

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Quaker Chemical Products Corp., Conshohocken, Pa., has announced selection of the trade name "Microcut" for its line of soluble cutting oil bases.

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American Standards Association, New York, has moved its offices to Grand Central Terminal Office building, 70 East Forty-fifth street, New York.

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Dallas Tank & Welding Co. Inc., Dallas, Tex., has changed its name to Dallas Tank Co. Inc.

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Carrollton Mfg. Co., Carrollton, O., announces purchase of all buildings, equipment, trademarks, copyrights, etc., formerly held by the Carrollton Metal Products Co.

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Shell Oil Co. Inc., New York, has published a new booklet entitled, "Turbine Cleaning Manual."

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Interchemical Corp., New York, announces one of its subsidiaries has contracted to acquire the assets of the Murphy Varnish Co., Newark, N. J. The Murphy company will augment operations of Interchemical's Ault & Wiborg division.

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National Bureau of Standards, Washington, reports metal lath and metal plastering accessories are greatly simplified and standardized in revision of the Simplified Practice Recommendation of the products.

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Bendix Radio division, Bendix Aviation Corp., Baltimore, will for the first time manufacture and market a line of home radio sets as soon as the military situation permits.

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Sentry Co., Foxboro, Mass., plans to exhibit one of its electric furnaces at the National Metal Congress in Cleveland, Oct. 16-20.

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Bureau of Mines, Washington, has published a survey of scientific material on preparation and properties of metal carbides and their importance as catalysts in the Fischer-Tropsch process, method of making gasoline and oil from coal.

I PREDICT...

by Morris Sanders

Industrial Designer of New York

The kitchen of tomorrow will have no taint of the drudgery that characterized it in the past. A symbol of its efficiency will be the new refrigerators you will buy with your War Bonds. I have designs in my files for a horizontal, counter-height refrigerator that enables the housewife to see its entire contents without wearisome stooping. It has multiple compartments with varying degrees of temperature from "deep freeze" to "cool", and a special "private" compartment for ice cubes. There will be no wholesale release of cold air every time the refrigerator door opens, consequently it will be more economical. Furthermore, its cubic area will allow for more actual storage space than in the past.

* * *

NOTE: The Weatherhead Company, one of the oldest and most important manufacturers of parts for the refrigeration industry, is prepared for the day when its four plants will be contributing as actively in peace as it has in war to the country's refrigeration needs.

Look Ahead with

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO

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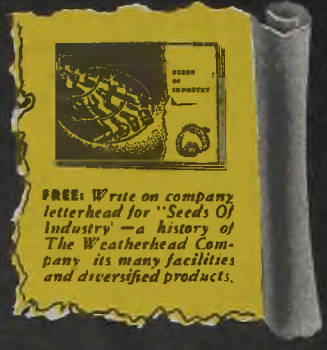


***FREE:** Write on company letterhead for "Seeds Of Industry"—a history of The Weatherhead Company, its many facilities and diversified products.*

By A. H. ALLEN *Detroit Editor, STEEL*

MIRRORS of MOTORDOM

Final determinant in selection of materials for postwar automobiles will be cost. Iron and steel expected to yield little ground to light metals or plastics. Low-alloy steels developed during war expected to retain considerable favor

ON the score of utilization of various materials in automobiles over the years just ahead, fairly general agreement is observed on the point that the final determinant is going to be cost, and for this reason iron and steel will yield little ground to the light metals, plastics or other materials. A prominent automotive metallurgist has declared that even if suppliers of aluminum donated the material, there would be an insignificant increase in its use on automobiles, since in comparison with ferrous metals the intrinsic worth of the metal itself is insignificant alongside processing costs and related factors.

This may be overstating the case somewhat for the ferrous metals, but at least it is a representative viewpoint. Impartial consideration certainly will accord aluminum a measure of increased acceptance, if only for nonfunctional parts, and it will not have to be donated by the producers.

One seemingly obvious resumption of aluminum use would appear to be in pistons where it was used widely before the war and then when it became a critical metal gave way to cast iron. Even in this instance, however, some metallurgists will argue that the principal reason for the use of aluminum in pistons was to reduce bearing loads, and now that bearings have been appreciably improved the need for light pistons may not be so important.

Expect NE Steels To Remain

Another favorite subject for discussion and argument is whether the NE series of triple-alloy steels will survive into the postwar period. Automotive metallurgists, who incidentally had a lot to do with the development of the national emergency steels in the first place, are convinced the steels will retain their favor in postwar automobiles in the competition with the older full-alloy steels.

Here again cost will have to be the measure and on the present basis, with some NE steels carrying higher extras than the full-alloy type, there is not much point to specifying the former. This relation is not going to remain in effect much longer, however, for a restudying of the entire alloy extra system is now in process, and there are grounds for believing that the steel companies, instead of lowering the prices of the NE steels, will seek to increase the prices of the full-alloy steels and hold the level of the triple-alloy series where it is. This would provide the necessary cost incentive for the continued use of NE steels in peacetime products.

Undoubtedly a new terminology will have to be worked out to apply to the triple-alloy steels for they will no longer be emergency-type steels, but more in the category of the original low-alloy high-tensile steels used extensively for constructional purposes.

Joint groups of the American Iron and Steel Institute and the Society of Automotive Engineers could profitably devote some time to a recasting of the entire steel specification terminology with the idea of eliminating the prefix "NE" and correlating all types of carbon and alloy steels under a single series of numbers. A good start has been made in this direction, but there is still confusion in the minds of engineers, because the changes have been so frequent there has not been sufficient time for the new identification system to become affixed in users' minds. A corollary development has been the proposal to use hardenability as a specification instead of merely chemical analysis. Late developments in this field are covered in the American Iron and Steel Institute's "Contributions to the Metallurgy of Steel—No. 11."

Over the past years has developed a pronounced movement in the direction of discarding chemistry and physical characteristics of a test bar as measures of the performance of a given steel in a given part. Surface hardness and related fatigue resistance as well as depth of hardness through sections comparable in thickness to the part for which the steel is to be used are recognized as the true indicators. While these developments are elemental to many leading metallurgical laboratories, they are not universally appreciated, and certainly design engineers have not kept any too well informed of progress being made.

The designer still is, and probably always will be, prone to tell the metallurgist, "Give me a steel that will do thus and so for a part of this or that size and shape." Then it is up to the metallurgist to produce the required material. If it works out satisfactorily, the designer takes the credit for a masterful job of design; if not then he directs the complaints to the metallurgist and tells him to "find out what the hell is the matter."

Wilson Speaks About Postwar Auto

Speaking at the formal opening and inspection of the new malleable iron foundry of the Saginaw Malleable Iron division of General Motors at Danville, Ill., C. E. Wilson, GM president, told guests, "When the bell rings and military production is cut back far enough to release the necessary manpower, materials and facilities, we are prepared to launch new car production in a surprisingly short time. However, if we are to produce cars in the first quarter of next year, as some have indicated, it is almost too late now. Nothing more can be done until the military program is cut back or completed. We do not believe it is practical to start production of small amounts of civilian goods until the way is all clear. We must have complete material specifica-

POSTWAR BUS: Experimental models of this Greyhound compartment coach will be built by General Motors Corp. and Consolidated Vultee Aircraft Corp., and, if priority restrictions are lifted, will be ready for road tests early in 1945. The coach was designed by Raymond Loewy, industrial designer, in collaboration with Greyhound engineers and technical experts of the automotive industry. NEA photo

tions and know the exact items we are going to put back into production before we can place orders with suppliers and get under way."

This outlook appears a trifle on the gloomy side and perhaps was directed more toward Washington than toward Mr. Wilson's immediate listeners. It still strikes more than one informed observer around Detroit that there may be some new Chevrolets on the market before the year is out. This belief is of course predicated on further important cutbacks in military production which certainly will be forthcoming this fall.

The new Danville plant of Saginaw Malleable has actually been in production for about three months, and the plant building itself was started last December. Principal product is malleable iron axle housings and differential carriers for heavy military trucks, output going chiefly to the nearby plant of Standard Steel Spring Co. which is building the axles on subcontract from Timken-Detroit. The foundry is built along the most modern lines, boasting latest innovations in conveying and handling equipment, as well as a full complement of dust collection equipment and other devices for abating the usual smoke, dirt and heat of an iron foundry. Employment runs about 600 men and women.

In the course of the Danville celebration, Mr. Wilson indicated the corporation is greatly pleased with its Illinois operations and plans to continue them if possible after the war. They include the Electromotive division at LaGrange, and the Buick Aviation Engine plant at Melrose Park.

"The quality of the people, their general skill, the power supply, transportation and conditions generally in Illinois have impressed every official of the corporation," Mr. Wilson concluded.

Last week saw demonstrations of two new military vehicles which automotive plants have been building for many months but which have been kept under cover by the Army. One was the Buick Hellcat, or high-speed tank, mounting a high-velocity 76-millimeter gun, which has been in production for over a year at Flint. It was put through its paces for newspaper men last Thursday, and embodies a number of novelties in tank design and construction, such as torsion bar suspension, large bogie wheels, etc.

Press Views M-29 Weasel

The second vehicle displayed was the Studebaker M-29 Weasel, a press demonstration being arranged at South Bend last Tuesday. This light tracklaying personnel carrier has been pictured and described briefly in these pages in recent weeks, but it is now revealed that a new type, the M-29-C is in production for amphibious operation. Body changes are the principal difference from the land version, the hull-shaped prow and special side skirts to cover the tracks partially and reduce water turbulence. To steer the vehicle in water, hinged rudders are released over the stern and are controlled by cables from the driver's station. Propulsion is furnished by the ribbed, semi-flexible tracks driven by a 6-cylinder gasoline engine. The vehicle will accommodate cargo or three passengers in addition to the driver, and special brackets permit conversion of the vehicle into a four-patient litter carrier.

Success of American amphibious vehicles in landing operations has been spectacular, with perhaps one exception —the amphibious jeep, on which production was suspended after a large quantity had been built. Kingpin of the amphibious motor fleet is the 2½-ton truck conversion known as the duck, which is a wheeled vehicle, propeller driven in the water. Another useful type has been the tracklaying alligator or water buffalo, based on original designs of the Food Machinery Corp. Now there is the M-29 Weasel, and it is reported the Buick Hellcat also has been adapted for amphibious use.

Culminating a seemingly endless series of day-to-day walkouts by UAW-CIO members at large and small plants throughout the Detroit area, many of them over trivial things like too much smoke in the plant to suit crane operators, women loafing in washrooms, etc., comes the usual labor day message from R. J. Thomas, president of the UAW, who in spite of the fact he is currently spending his time wearing a tin hat and uniform and shaking hands with soldiers in France, still has contrived to release a 500-word statement for the occasion. He maintains the UAW can feel great pride in the role it has played in achieving the not-far-distant victory; that it has done the mightiest production job in history, even in the face of "provocation by powerful forces of reaction."

Looking ahead to the reconversion of industry he sounds an ominous note: "Unemployment will decimate our ranks, reduce our influence to a shadow of our present prestige . . . if our veterans are not to return to breadlines and Hoovervilles, if our production line heroes are not to be rewarded with layoffs and poverty, labor must make its voice heard. The Du Ponts and Morgans and Sloans have their blueprints for the postwar economy. It is up to us to counter them with a blueprint of our own."

All these terrible things, Mr. Thomas stoutly maintains, can be avoided, if his boys and girls just get out and vote once more in the same old way at the coming election.

BRIDGE BUILDER: A U. S. Army Engineers' heavy carrier with bridge building body and crane built by the Heil Co., Milwaukee, backs into position for unloading its cargo at water's edge. They are 31 feet long and weigh 26 tons loaded, are fast and easy to handle

Sees Bearing Industry with Minor Reconversion Problem

Of all industries in the war effort, perhaps none will require less transition for postwar era than America's bearing industry, according to H. O. K. Meister, Harrison, N. J., president, Anti-Friction Bearing Manufacturers Association, New York.

"Not only will this be true mechanically but it also will be true regarding the peacetime products of the industry—ball and roller bearings," said Mr. Meister. "After the war, bearing companies will continue to manufacture the same products they now are making."

WING TIPS

Dodge Chicago Plant, producing Wright 3350 radial engines for B-29, Martin Mars and Lockheed Constellation, fantastic in size. Machine shop and assembly test building cover 82 acres under one concrete roof. Nine thousand machine tools used

WHEN, a couple of years ago, a small group of engineers and production experts at Chrysler Corp. in Detroit were called together to hold a preliminary conference on the subject of building and operating an airplane engine plant in Chicago, they were amazed at the scope of what they were undertaking and the picture of how it would look by August, 1944. The operation was assigned to a new division of the corporation called the Dodge Chicago Plant, division of Chrysler Corp., with the plant having the same name.

Like so many another war plant, the site of "Dodge Chicago" was the customary weed-patch to start and today its 19 buildings are sprinkled over 500 acres of land southwest of Chicago 14 miles, comprising one of the nation's top war enterprises in point of size. Reasons for the dispersal of the buildings over this broad area are two: Military security and possible future expansion—though it is difficult to see how any expansion of this already vast and highly integrated operation would be required.

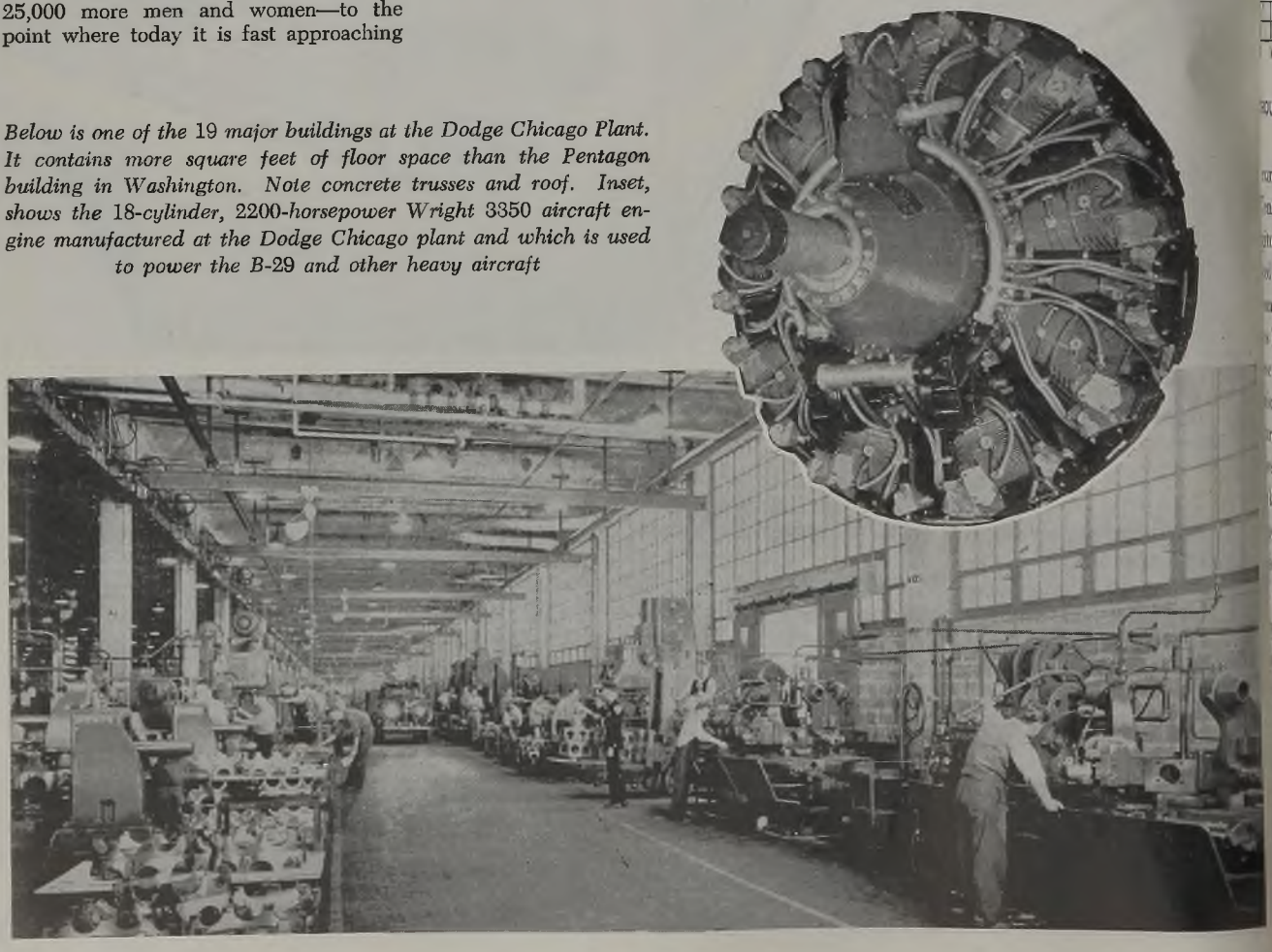
The original group of 150 Chrysler and Dodge production men has been reinforced by Chicago technicians and some 25,000 more men and women—to the point where today it is fast approaching peak projected production, a figure which the AAF will not disclose for some peculiar reason, but which will not be reached until some time next year. Company sources say thousands more employes will be needed.

To try to give an overall picture of this engine-building facility in mere words is an utter impossibility. Staggering figures can be stacked end on end and are still meaningless when you place them alongside an actual glimpse of the plant and its operations. An 82-acre machine shop and assembly-test building all under one concrete roof; a heavy steel forge and upset shop; a light steel forge shop; an aluminum foundry; a magnesium foundry; heat treating and die shop; a stock sawing building; several power plants; half-mile long piles of 150,000 tons of coal; $25,000 worth of electric power generated monthly by generators connected to engines on test in 42 test cells, still leaving a monthly power bill of $105,000; 14 cafeterias annd restaurants supplied by a central kitchen where a ton of meat is cut up daily, pies are baked on an assembly line and prices are near the lowest of any war plant eatery this observer has seen; 9000 machine tools chewing up endless piles of aluminum, magnesium and steel engine components; 500 miles of telephone wire, 8½ miles of company roads, 3½ miles of sidewalks, 4 miles of railroad tracks; two 100,000 gallon water tanks and a 3,000,000-gallon water reservoir; 13 parking lots, one a block wide and a mile long accommodating 8000 cars; enough steam generated in a year's time to heat the entire Chicago loop district for one winter. In fact if you set the plant side squarely on top of the Chicago loop it would cover the entire district and beyond, from Michigan avenue west to Morgan street and as far north and south as from Wacker drive to the Congress hotel.

Twenty-two acres of air-conditioned floor space, 42,000 electric light bulbs and fluorescent tubes; the world's largest coffee urn holding 125 gallons of water and 35 pounds of coffee.

The forge shops have hammers ranging from 2000-pound to 35,000 pound capacity and upsetters from 1½-inches to 8 inches. One dreamy statistician says that the ram of one of the 35,000-pound hammers, at the end of its 50-inch travel, delivers an impact of 56,000 tons; he may be right, this digit-happy witness will take his word for it. There are big aluminum and magnesium foundries, also.

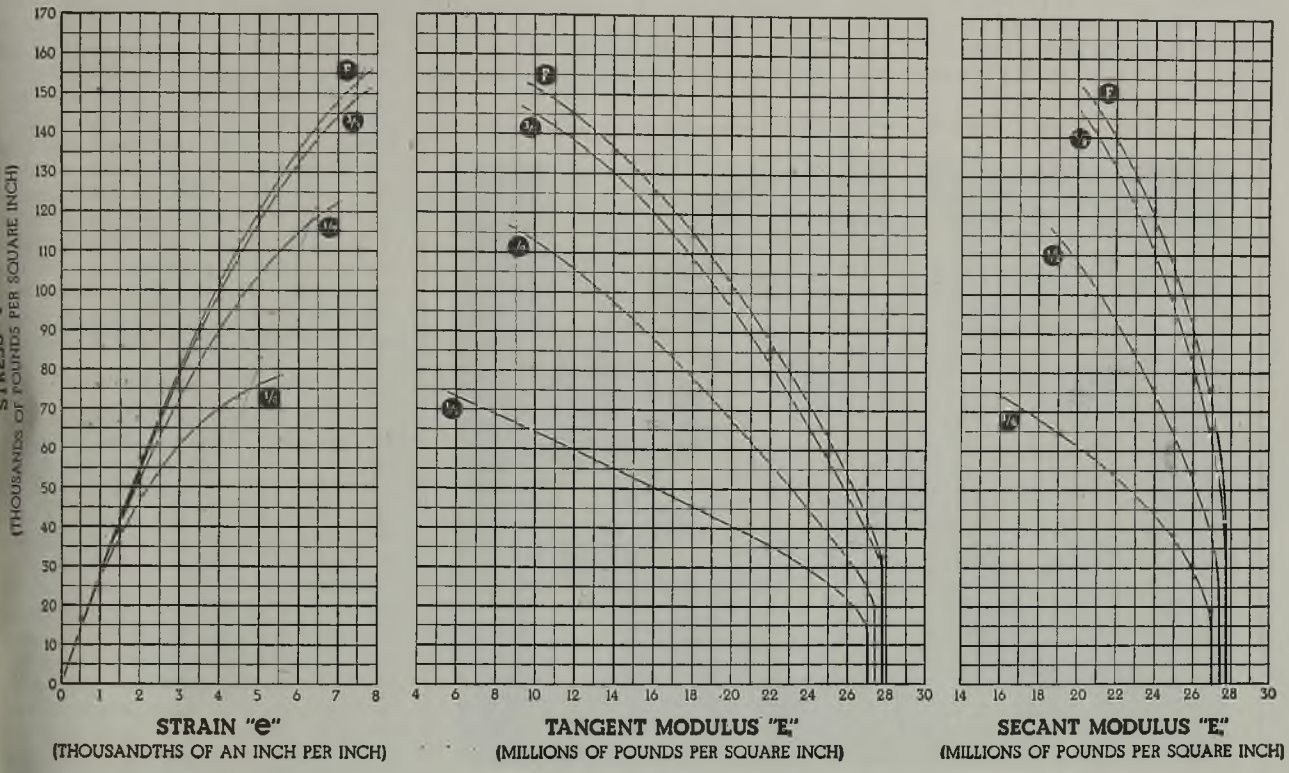
When you get down to the meat of the



Below is one of the 19 *major buildings at the Dodge Chicago Plant. It contains more square feet of floor space than the Pentagon building in Washington. Note concrete trusses and roof. Inset, shows the* 18*-cylinder,* 2200*-horsepower Wright* 3350 *aircraft engine manufactured at the Dodge Chicago plant and which is used to power the B-29 and other heavy aircraft*

What the Design Engineer Should Know

ABOUT HIGH TENSILE STAINLESS



These curves show the tensile properties of ARMCO *High* Tensile Stainless Steel Sheets from tests made on longitudinal specimens as cold rolled. They are reproduced from a practical new handbook that contains compression and tension values of high strength stainless for the complete useful range.

These data give the stress-analyst and designer the information needed to proportion stronger, lighter structural parts with *less* stainless. Construction of light-weight transportation equipment demands adequate knowledge of the compressive strengths that can be expected from the materials you use.

Besides the detailed values for stainless, the handbook covers some fundamental concepts of design theory to be considered when using stainless steels at the high stress levels where they are most effective. Mechanical properties of the stainless steels and derived design data are also included in the book.

		¼ Hard	½ Hard	¾ Hard	Full Hard
Ultimate Strength—thousands of lb. per sq. in.	F_{tu}	133	162	183	187
Yield Strength at 0.2% Offset—thousands of lb. per sq. in.	F_{ty}	75	117	147	153
Proportional Limit at 0.01% Offset—thousands of lb. per sq. in.	F_{tp}	35	49	59	61
Initial Modulus of Elasticity—millions of lb. per sq. in.	E_o	27.0	27.5	28.0	28.0
Elongation—per cent in 2 in.		46	37	31	29

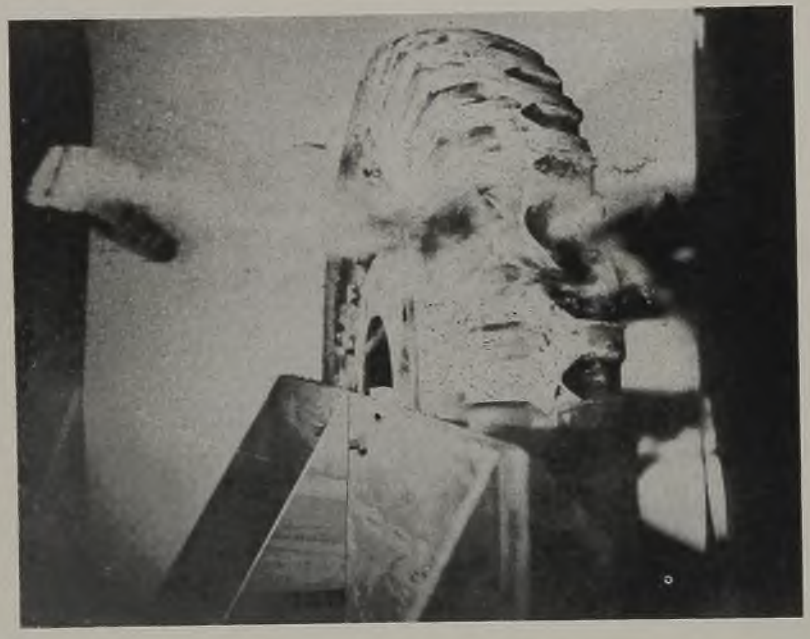
If you are a designer of light-weight structures, write us on your company letterhead for a free copy of this handbook. It is titled: "Design Data on High Tensile Stainless Steel Sheets for Structural Purposes." You'll find it a valuable addition to your design manuals. The American Rolling Mill Company, 2611 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

STAINLESS ARMCO STEEL

THE AMERICAN ROLLING MILL COMPANY

plant's operations, it is not the figures or the stratospheric statistics which are important. The striking fact is that here is an example of American engineering know-how, schooled in automotive classrooms, which has taken virtually a brand-new product, never built before in anything approaching quantity, and by dint of herculean effort fitted it into the mass production groove in record time. The sweat of the thousands engaged in the advanced planning is perhaps even more remarkable than the actual finished production operation itself. Hundreds of engineers worked two shifts 12 hours a day seven days a week until they were almost bleary-eyed getting this Wright 3350 engine and its thousands of components fitted through the proper production channels, so that as the huge 18-cylinder 2200-horsepower units come off the green line and move on through the test, teardown reassembly and final test, they will be exactly right, each one like its predecessor.



CANNON PROOF: Laboratory gunfire at Wright Field, O., illustrates the efficiency of self-sealing military tires. Using a micro-flash light, which allows exposures at two-millionth of a second, experts of the technical data laboratory learn what happens when a 37-millimeter shell plows through a tire which has been in combat service for several months. After the shell passed through the inflated tire only slits in the tread marked its route. The tire was good for 100 miles travel after being hit

Naturally, it was not all smooth sailing. Short tempers snapped here and there; some early key figures fell by the wayside in bickerings which go on wherever human beings work together. Nevertheless, taking the overall view, the project is a real credit to the Chrysler Corp. and to 40-year old L. L. "Tex" Colbert, plant manager, and his "general staff" of 14 executive assistants.

A word about the Wright 3350 radial engine is in order. It is of particular interest because it is the only aircraft engine which is basically a steel design. While most radial engines have steel crankshafts, rods, gears, propeller hubs and other internal parts of alloy steel, the Wright design also has front, rear and center crankcase sections of 4140 steel, providing enhanced stiffness and strength to the "frame" of the power plant without pushing the weight-per-horsepower rating of the engine beyond the conventional level of high-power radials—1:1. The 18 cylinder barrels of the engine also are of steel and are manufactured complete at the Dodge Chicago Plant, beginning with hot upsetting from round billets, on through hundreds of machining operations, selective nitriding of the inner wall, fitting stamped aluminum cooling fins into grooves machined in the outer wall and finally shrink threading them onto the cast aluminum cylinder heads.

The engine is a two-row radial, with cylinders staggered to improve cooling of the rear row. Its displacement, 3350 cubic inches, while the largest in the Wright series, does not make it the largest radial in production, for work is now in process on a larger displacement model, though the latter is a four-row radial. Despite the greater power of the 3350, its frontal area is not greatly beyond the 2000-horsepower models of Wright and Pratt & Whitney, extra power coming principally from the larger cylinder diameter.

The Wright engine, which incidentally powers the Martin Mars and the Lockheed Constellation in addition to the famous Boeing B-29 bomber, is distinguished also for its use of a number of good-size magnesium castings, chief of which are the rear supercharger housing and the front nosepiece, though these features are also made use of on smaller Wright models.

To return again to the incredible Dodge Chicago Plant, the showspot of the 60-odd acre machining building is the line for processing cylinder heads. The line is a closely spaced series of milling, drilling, reaming and tapping machines grouped along both sides of a central conveyor line on which cylinder heads travel. The machines are interconnected and fully automatic in operation, the entire line handling 269 separate operations with only three operators and a few maintenance men. The equipment is enormously expensive, but will turn out a completely machined cylinder head every 54 seconds. Dodge Chicago shortly will have two of these lines in operation.

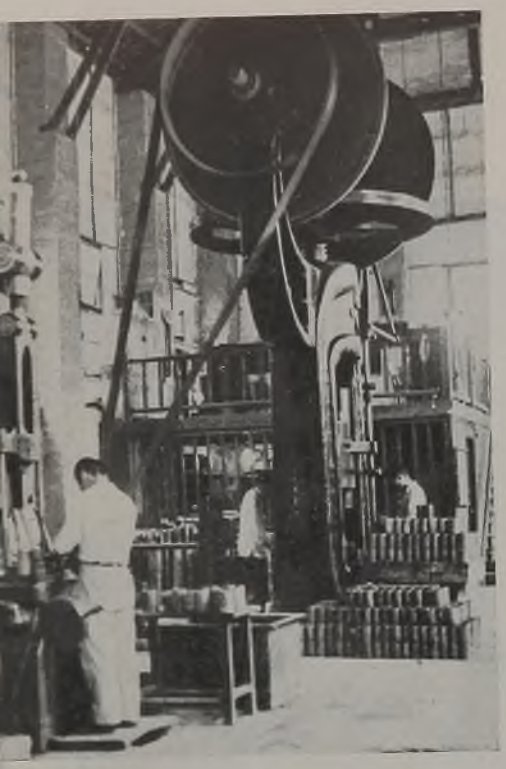
May Become Auto Plant

Also spectacular is the installation of 62 nitriding furnaces for processing cylinder barrels, and an adjacent department comprising 24 circular pit-type gas carburizing units, in two lines of 12 each, with three lines of 12 cooling furnaces between them.

It requires no great exercise of the imagination to conceive of the Dodge Chicago Plant some day becoming an integrated automobile manufacturing center. The essentials are there—forge shops, foundries, machine shops, ample area for eventual erection of a press shop and body plant. Obviously all these would require some rearrangement but even so it would be much easier than starting from scratch. In addition, there is a large force of enthusiastic working people who want to stay on the job after the war.

Furthermore it is inconceivable that any such size airplane engine building facility would have the remotest postwar justification, even as a standby. Right now, of course, Chrysler officials brush aside any such suggestions as ridiculous. After all, they say, the plant belongs lock, stock and barrel to the DPC and its eventual disposition will be up to that body.

But certainly, in occasional moments of relaxation, Chrysler executives and engineers have given and are giving plenty of thought to the probable future of the Dodge Chicago Plant. Did not many of them literally burn themselves out to make it click? Will not the success of the plant and its intimate association with the Chrysler family of managerial talent make its eventual ownership and reconversion by Chrysler almost a dead certainty? Would not Dodge Chicago be an obvious place to move overcrowded or obsolete Detroit operations of Chrysler some time hence? Anyone who would answer anything but "yes" to these questions is either blind to the facts or else just double-talking.



Chinese, American Shop

A STUDY in contrasts is afforded by the accompanying photographs depicting mnnitions manufacture—in China, at left, and in the United States, at right.

At upper left, Chinese workmen are producing shell cases on rather primitive machinery. Circle shows the production of 60-millimeter mortars while below is Chinese-built antitank gun.

Contrast these scenes with those in American factories at right. Upper photo shows the mass production of 20-millimeter cannon for installation in aircraft in a converted automobile factory. Center shows aerial torpedoes on the line of the American Can Co.'s plant in Forest Park, Ill., and below, heavy rifles are being machined at the Navy gun plant in Washington.

Seven years of war have forced China to take its first faltering steps toward industrialization, a procedure which has been handicapped by a lack of machinery. However, the country's leaders now are dreaming of the peacetime day when they will produce automobiles and aircraft for pleasure use. Both the coal and the iron ore are available for a considerable iron and steel industry. If credit can be arranged, China should be an important postwar market for American-built machinery, and it is possible that some of this country's surplus tools will be disposed of there.

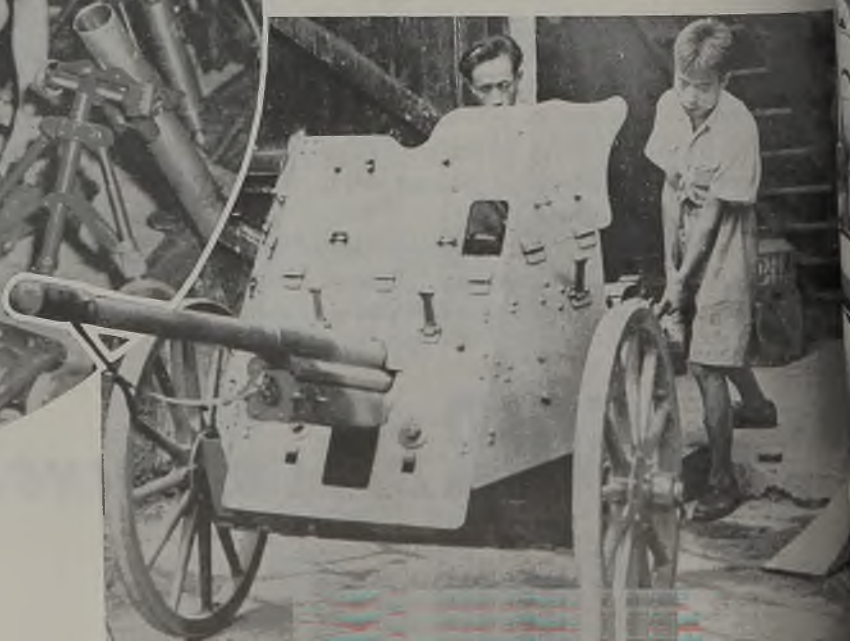
China's industry today is extremely small. A Ministry of Economic Affairs of Free China recently undertook a registration of the country's factories and found there were 1915 using power-driven machinery and employing more than 30 workers each. Of these, 28.6 per cent were making equipment; 27.2 per cent, chemical products; 22.7 per cent, textiles and clothing; 7.1 per cent, metallurgical products; 5.2 per cent, food products; 3.2 per cent, electricity.

When the Japanese swarmed over the East Coast cities where practically all the factories were located before the war, the Chinese were able to salvage a portion of their machinery and move it back into the interior. Here small industrial co-operatives were organized along the lines of the ancient Chinese family businesses. Often these shops were located in caves as protection from Japanese bombers.

The index of production by private industries rose from 100 in 1938 to 185.85 in 1940 to 242 in 1941 to 302 in 1942 and 375 in 1943.

Added to the output of the private industries is that of the National Resources Commission, which originally was organized in 1932 as the National Defense Planning Commission. In 1943 this agency was operating electric utilities, metallurgical works, machine manufacturing plants, chemical plants and petroleum refineries. Index of production by the Resources Commission rose from 100 in 1939 to 689 in 1940 to 1357 in 1941 to 2308 in 1942 and to 3652 in 1943.

In the opinion of informed observers, however, industrial production in China



n Shffer Study in Contrasts

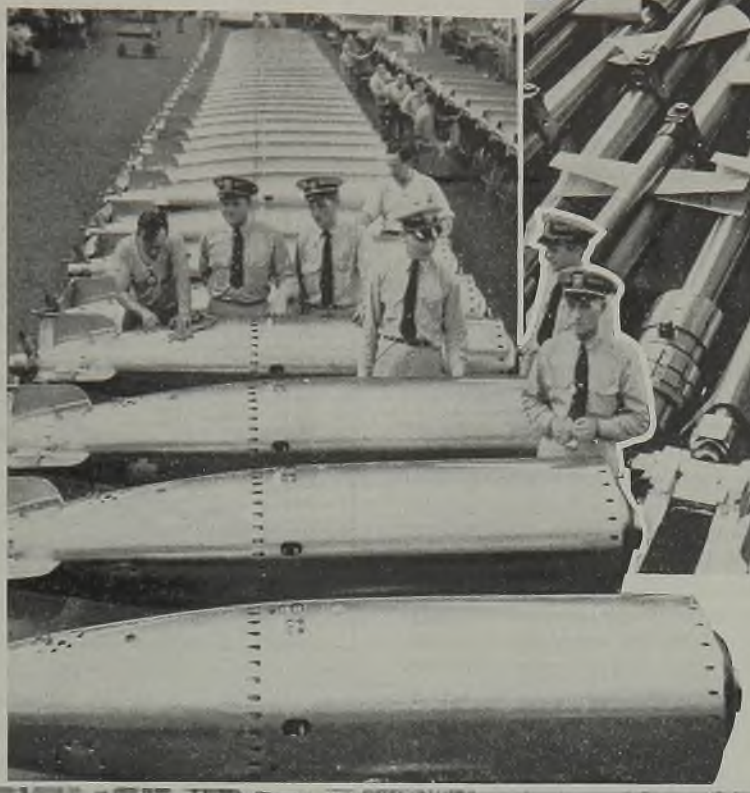
Country handicapped by lack of modern machinery. May become important outlet for surplus United States tools after the war, provided adequate credit can be arranged. Leaders dream of producing pleasure cars and aircraft

declined during the first half of 1944, with capital goods output falling more than consumers' goods. Increase in production of capital goods from 1942 to 1943 was only 16 per cent compared with 44 per cent for consumers' goods.

Steel mills have operated in recent months at only a fraction of capacity. Some machine shops in Chungking have closed down, and others in the Kweilin area are reported to be operating at only one-fourth of capacity. Demand by private enterprise for steel and machinery is very limited, despite shortages.

Investors in China are reluctant to buy locally built machinery at present inflated prices, in fear of being at a disadvantage with their competitors who will wait perhaps two years to obtain superior imported machinery at much lower prices.

Cost of machinery in China has been increased by the policy of builders trying to defray their overhead on the few orders they receive, and of adding an extra 50 per cent or more on the justifiable assumption that costs will have increased before an order is completed, because of inevitable price increases.



THE BUSINESS TREND

Industrial Output Seen Moving to Lower Levels

FURTHER easing in munitions output has occurred in recent weeks and this downward tendency is expected to continue despite efforts to overcome the lag in certain war programs. The fact that the bulk of munitions items are ahead of schedule is seen offsetting the stimulant to war production resulting from intensive efforts to bring in line some 13 lagging programs.

Inroads are being made into order backlogs of most war industries, in sharp contrast to the situation prevailing this time a year ago. The steel industry is one major exception, with deliveries on sheets, bars, plates extended into second quarter next year. Steel ingot output has been fluctuating between 94 and 96 per cent of capacity for some time past due to the manpower shortage.

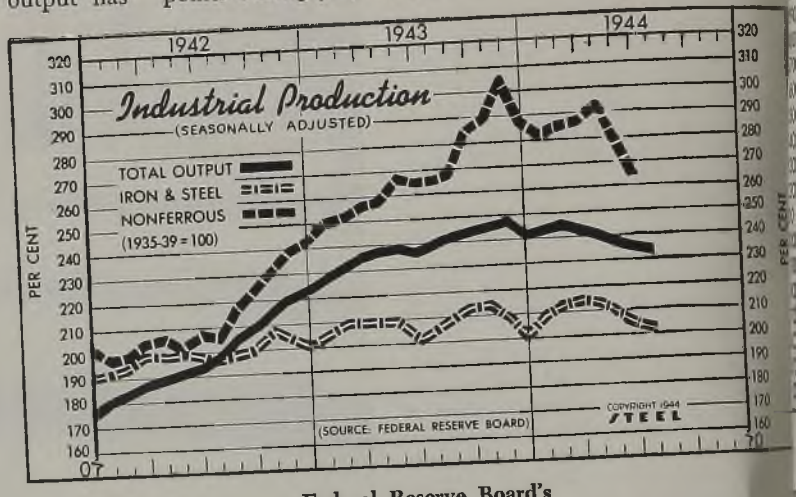
MANPOWER—Nearly 400,000 workers are needed by the lagging 13 key war industries, the Office of War Information states. Output in these 13 programs is close to originally established goals, but is lagging badly in the light of revised requirements. For 12 of the programs there is need for nearly 300,000 workmen, most of them by the first of next year or earlier, with shipbuilding and repair alone requiring 110,000 by Jan. 1. The programs in which shortages are classified as critical and requiring intensive manpower recruitment are: Tires, tire cord, heavy trucks, tanks, heavy guns, heavy ammunition, signal equipment, shipbuilding, ship repair, lumber, basic lumber products, cotton duck, and food processing.

CONSTRUCTION—July bookings of fabricated structural steel for bridge and building construction were the largest since June, 1943 and a further increase is indicated for August. Shipments of fabricated structural steel during July declined to the lowest monthly total this year of 33,994 tons.

EQUIPMENT ORDERS—Sales of foundry equipment during July declined to the lowest level since September, 1943. Foundry Equipment Manufacturers Association's index on foundry equipment sales stood at 375.8 during July, compared with 466.1 in preceding month. Gear sales also recorded a sharp decline during July of 26.2 per cent. The American Gear Manufacturers Association's index was off 86 points in that month to 242, and compared with 374 in July 1943.

CASTINGS OUTPUT—Production of steel castings eased in June to 157,444 net tons, comparing with 161,783 for May and 163,934 tons in June, 1943. Orders recorded a moderate gain to 181,816 net tons during June. In June, 1943, the order volume totaled 171,774 tons.

INDUSTRIAL PRODUCTION—Output of factories and mines continued to decline slightly in July the Federal Reserve Board's production indexes show. The monthly production index, compiled by the Board, eased two points during July to 233.



Federal Reserve Board's Production Indexes

(1935-1939 = 100)

	Total Product'on		Iron, Steel		Nonferrous	
	1944	1943	1944	1943	1944	194
January	242	227	208	204	281	
February	244	232	212	208	285	
March	242	235	214	210	286	
April	239	237	213	209	292	
May	237	238	210	208	279	
June	235	236	204	201	264	
July	233	240	202	204	...	
August	...	242	...	209	...	
September	...	243	...	218	...	
October	...	247	...	214	...	
November	...	247	...	209	...	
December	...	241	...	200	...	
Average	...	239	...	207	...	

FIGURES THIS WEEK

	Latest Period*	Prior Week	Month Ago	Year Ago
INDUSTRY				
Steel Ingot Output (per cent of capacity)	95	97	96	98.5
Electric Power Distributed (million kilowatt hours)	4,418	4,451	4,391	4,322
Bituminous Coal Production (daily av.—1000 tons)	1,978	2,018	1,998	2,019
Petroleum Production (daily av.—1000 bbls.)	4,667	4,675	4,608	4,196
Construction Volume (ENR—unit $1,000,000)	$37.3	$42.3	$41.1	$40.6
Automobile and Truck Output (Ward's—number units)	19,855	18,800	19,620	20,055
TRADE				
Freight Carloadings (unit—1000 cars)	895†	887	911	904
Business Failures (Dun & Bradstreet, number)	22	19	19	54
Money in Circulation (in millions of dollars)‡	$23,047	$23,020	$22,584	$18,303
Department Store Sales (change from like week a year ago)‡	+13%	+5%	+15%	+4%

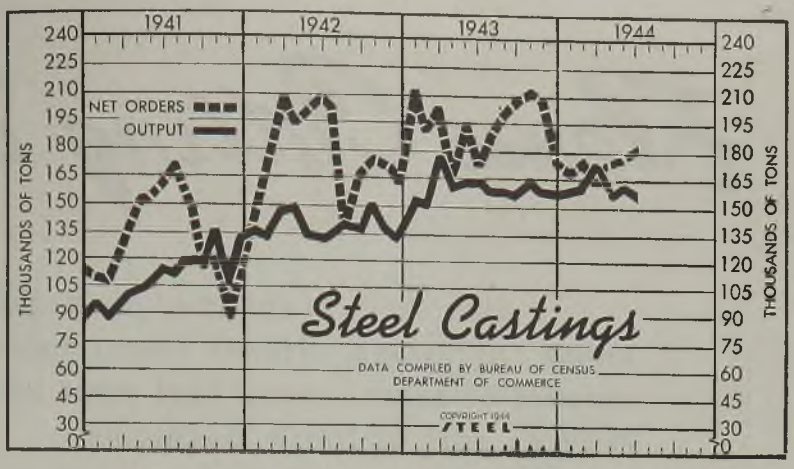
*Dates on request.

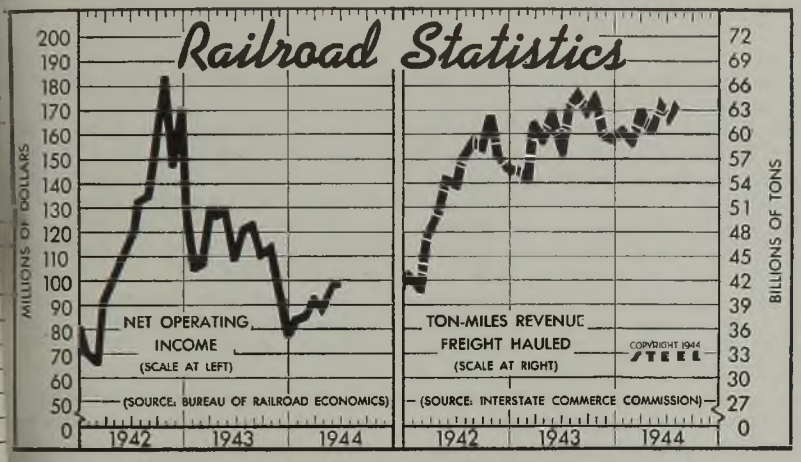
†Preliminary. ‡Federal Reserve Board.

Commercial Steel Castings

(Net tons in thousands)

	Orders		Production	
	1944	1943	1944	1943
Jan.	167.7	213.1	159.8	154.7
Feb.	173.6	191.2	161.4	151.5
Mar.	162.6	202.7	174.6	176.5
Apr.	175.1	165.8	155.8	161.4
May	177.0	192.5	161.8	163.8
June	181.8	171.8	157.4	163.9
July	.....	187.3	.....	158.8
Aug.	.....	200.6	.....	158.8
Sept.	.....	214.1	.....	157.8
Oct.	.....	211.3	.....	163.9
Nov.	.....	209.3	.....	158.8
Dec.	.....	173.6	.....	158.6
Total	.....	2,333.4	.....	1,928.6



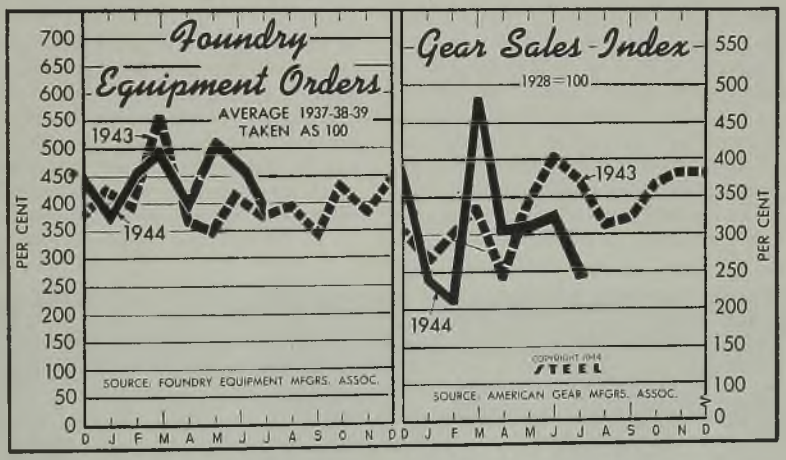


Statistics of Class I Railroads

	Net Operating Income			Ton-Miles Revenue Freight		
	1944	1943	1942	1944	1943	1942
	(millions)			(billions)		
Jan.	$82.8	$105.3	$66.8	60.5	55.1	43.0
Feb.	84.5	105.8	64.4	59.3	54.4	40.8
Mar.	92.5	129.7	90.6	63.0	61.2	48.3
Apr.	87.7	128.7	101.6	60.4	59.1	50.0
May	98.5	129.5	109.7	64.0	62.1	54.2
June	99.8	109.0	118.7	62.0	58.0	53.9
July	....	120.6	133.6	63.8	63.7	57.0
Aug.	....	124.6	135.9	..	65.1	58.6
Sept.	....	110.2	155.1	....	62.5	58.2
Oct.	....	113.1	184.8	....	65.0	62.2
Nov.	....	96.4	149.0	....	59.6	57.0
Dec.	....	76.9	174.4	....	59.4	55.0
Avg.	....	$118.5	$122.9	....	60.5	53.2

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	362.7	1089.3	308	240	378
May	503.9	348.9	653.6	305	342	421
June	466.1	413.6	774.0	328	401	373
July	375.8	379.4	800.8	242	374	344
Aug.	.....	390.4	510.8	...	312	380
Sept.	.....	346.6	446.4	...	320	351
Oct.	.....	436.6	540.6	...	368	263
Nov.	.....	388.0	338.8	...	387	359
Dec.	.....	442.8	382.5	....	387	300
Avg.	.....	440.3	646.7		336	355



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$4,238	$4,186	$9,961	$3,855
Federal Gross Debt (billions)	$210.9	$210.8	$209.1	$147.6
Bond Volume, NYSE (millions)	$28.5	$27.2	$36.8	$28.6
Stocks Sales, NYSE (thousands)	3,792	4,722	4,153	2,698
Loans and Investments (millions)†	$56,383	$56,524	$57,304	$47,040
United States Government Obligations Held (millions)†	$42,229	$42,289	$42,424	$34,574

†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)†	250.6	250.8	250.2	246.9
Industrial Raw Materials (Bureau of Labor index)‡	112.8	114.3	113.8	112.7
Manufactured Products (Bureau of Labor index)‡	101.1	101.1	101.1	100.0

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

Flame Cutting Under Wate

. . . eliminates problem of distortion, avoids straightening operations, affords closer tolerances, cuts down amount of excess metal that must be allowed and thus reduces cost of finish machining

By GEORGE R. REISS

THAT VEXING and often expensive problem of straightening warped and twisted steel plates that have been flame-cut into intricate patterns has been solved by flame-cutting them under water . . . And it is greatly speeding up production, as well as saving much money, manhours and machine time.

The solution was found by an organization that normally is in the business of selling automobiles and now is only temporarily in the category of a metal-working plant, the Buick-Youngstown Co., Youngstown, O., which is cutting and preparing steel plate parts for armored vehicles under subcontracts with the manufacturers.

This new method of flame-cutting steel plates under water has proved so successful that it is being adopted by the United States Army's Watertown, N. Y., Arsenal, as well as by numerous other plants making and preparing plate for armored vehicles. Executives of the company see many possibilities for peacetime industrial uses in the new development, because all those concerns that cut and prepare steel plates thus can save much straightening time.

The Buick-Youngstown Co., headed by E. D. Hopper, was virtually put out of business by the suspension of automobile building.

Not content with being idle or going out of business, its executives rounded up a quantity of equipment and men and took war contracts. Now its operations have been expanded into four additional Youngstown plants, with contracts that include remanufacture of scout cars and half-tracks at the Arena, a peacetime ice-skating rink.

Cutting steel plates, particularly high-alloy armor plate, has always been a headache for fabricators; and that's part of the reason army tanks and other armored vehicles are so expensive. The steel is tough, and the parts are very complex, requiring unusually close tolerances. Besides, they warp and twist out of shape when flame cut, requiring much straightening and making it more difficult to cut to close tolerances.

"If only we could eliminate that warping," complained executives of the company.

They tried numerous experiments to eliminate the warping. Then along came D. H. Genter, of the Standard Steel Spring Co.'s armor-plate division, in on one of his numerous visits to the Buick-Youngstown plant which had some Standard subcontracts.

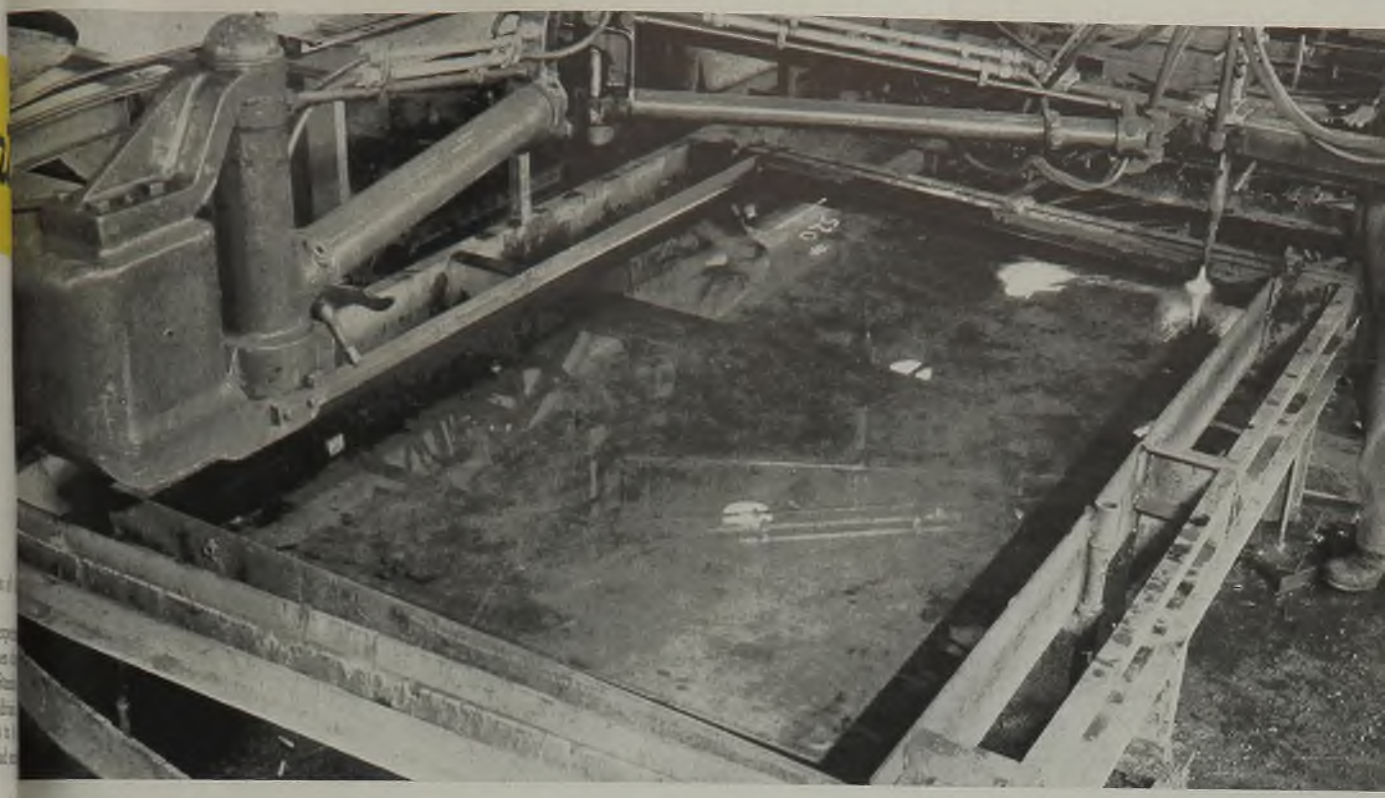
"Why not," he suggested, "try cutting the plate under water?"

"That," replied Mr. Hopper, "is an idea."

Buick-Youngstown immediately began experimenting, found the idea would work when plates were immersed exactly under ¼-inch of water—no more and no less—and that they could be cut without later straightening. In addition, the cutting could be to closer tolerances because there was no danger of the cuts being off after straightening due to the warping allowances.

The shop now is equipped with several tanks for underwater cutting, speeding up production about 10 times.

"Upon looking into what happens



when we burn through a piece of steel with a torch," says Mr. Hopper, "we find some rather interesting things. Contrary to the usual concept, it is not the flame which does the cutting but rather the stream of oxygen coming from the cutting tip's central orifice.

"We ring this orifice with a series of flames called preheat flames for the purpose of bringing the metal at the top of the cut up to incandescent heat, in which state it unites readily with oxygen producing an exothermic reaction resulting in an extremely fluid iron oxide slag. The slag washes down through the plate and as our torch progresses, we produce a cut and obtain whatever shape we desire by guiding the torch with a pattern.

"Obviously, to produce an oxide of iron as quickly as we do in the operation of flame cutting and have it fluid enough to wash away readily as the oxygen stream progresses along the path of the cut, temperatures in excess of 3000 degrees Fahr. are attained.

"Being an excellent conductor of heat, the steel dissipates the heat from the cut surface very rapidly. Thus, with the very high temperatures obtained in cutting and the rapid dissipation of the heat by the body of the steel itself, we produce a very drastic quenching action along the cut surface.

"Obviously then, the microstructure of the metal at and in the immediate vicinity of the surface of the cut is of radically different character than that found in the body of the plate. Aside from the extreme hardness which would be caused by this effect in a steel having any appreciable hardenability, there would also be strains of no slight proportions occurring in the plate.

"In addition, as the heat of the cutting is dissipated into the plate, there is some relieving of other strains which were previously put there by the original heat treating and straightening of the material.

"This upsetting of equilibrium conditions in the plate naturally results in extensive warping. This warping becomes more and more evident as the gage of the material is reduced since the

(*Please turn to Page* 136)

Fig. 1—(*Above*)—*Plate of ½-inch high-alloy steel for armored vehicles is immersed under a ¼-inch water covering. Oxyacetylene torch is shown beginning cut at upper right*

Fig. 2—(*Left, opposite page*)—*Operators watching completion of an underwater cut. Note template and follower at right for guiding torch automatically*

Fig. 3—(*Left*)—*Scrap being lifted from tank after completion of cut*

By LIEUT.-COL. HAROLD R. TURNER
Ordnance Department, U. S. Army

STEEL presents a detailed factual report on the problems involved and the manufacturing methods employed in producing steel cartridge and shell cases for the Army. Although the program was virtually discontinued in December, 1943 at the conclusion of the more critical phase of the materials shortage, the experiences gained will prove useful to steel producers and fabricators, especially in connection with problems involving deep drawing.

The report was prepared by Lieut. Col. H. R. Turner for the Army Ordnance Association, Washington, and presented in Army Ordnance Report No. 5. Colonel Turner is chief of the technical division suboffice, Office of the Chief of Ordnance, Dover, Del. He was formerly chief of the Cincinnati engineering suboffice, Ammunition Branch, Ordnance Industrial Division and deputy chairman of the Cartridge Case Industry Committee.

In connection with the subject of steel shell cases, it may be pointed out that the Navy is continuing its program and heat-treated carbon steel cases for 40-millimeter shells are being produced monthly by the millions.

ACTIVE development of steel cartridge cases was initiated in the latter part of 1941. In December 1943, the production of steel cartridge cases was discontinued for the Army with the exception of one contract. Of activity in those two intervening years, much information has appeared in the press—some factual, much incomplete, and some definitely erroneous. Since the development and production of steel cartridge cases represents one of the great co-operative efforts on the part of American industry, culminating in a material measure of success, it seems highly appropriate to present the history of the project.

Efforts to produce steel cartridge cases were not new at the start of this program. Work had been done in this field in 1917 by one American manufacturer, and the German army used steel cartridge cases in a limited manner then. During the years that elapsed, periodic attempts were made to develop adequate steel cases. Early in 1941, the American Fork & Hoe Co., Cleveland, undertook the development of two calibers of steel cartridge cases, which development enjoyed a fair measure of success.

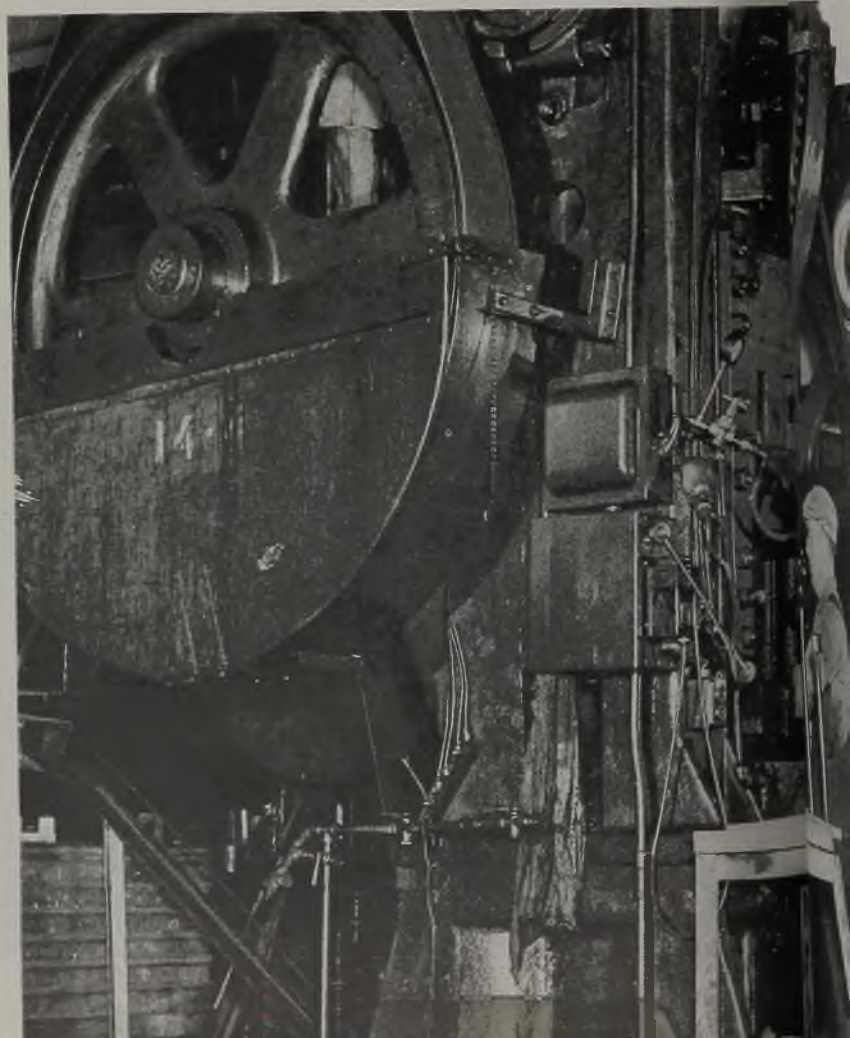
Substitute Required

In the fall of 1941, copper and its alloys became highly critical. Sea transport from South America was unavailable to bring in copper from Chile. The demands of the Maritime Commission and the Navy for copper, which was almost irreplaceable in vessels, appeared to be absorbing almost the entire available supply. Requirements for small-arms ammunition assumed almost astronomical proportions. By the same token, the needs for artillery ammunition, both for cartridge cases and for other components, showed spectacular increases. The copper was not then available, and substitution had to be made. By virtue of the farsightedness of high-ranking officers of the Ordnance Department, a program of development was initiated to endeavor to make artillery cartridge cases from steel. It was the hope that this development could be accomplished in time to prevent any possible shortage of artillery ammunition due to lack of copper. By comparison, steel was plentiful, and this was the logical metal to turn to in the accomplishment of the task.

The production of cartridge cases is accomplished by deep drawing, and to this end a comprehensive survey of American industrial plants was made with a view to determining the company or companies whose peacetime activities produced items similar to cartridge cases in general contour. It was found that the Corcoran-Brown Lamp Division of the Electric Auto-Lite Co., Cincinnati had been in the business of producing, among other things, pressure cylinders used in the refrigeration industry. These cylinders were long in comparison to their diameter and indicated that the equipment and "know-how" in that company could be quickly utilized. Development contracts were entered into with the purpose of accomplishing the development of two of the smaller calibers of artillery cartridge cases.

Used Lower Carbon Steels

Early efforts established that, at least cartridge cases having appropriate contour and accuracy could be produced. The earliest cases were made from low carbon steels, and firing results were completely unsatisfactory because the physical properties were inadequate. The next efforts were made with mild al-



Buick developed a process of hot cupping which used slugs of metal cut from bar stock, heated to forging temperature by induction heating and forged in comparatively slow-acting draw presses. Photo shows steel cups for 75 millimeter cartridge cases being drawn while hot on crank presses

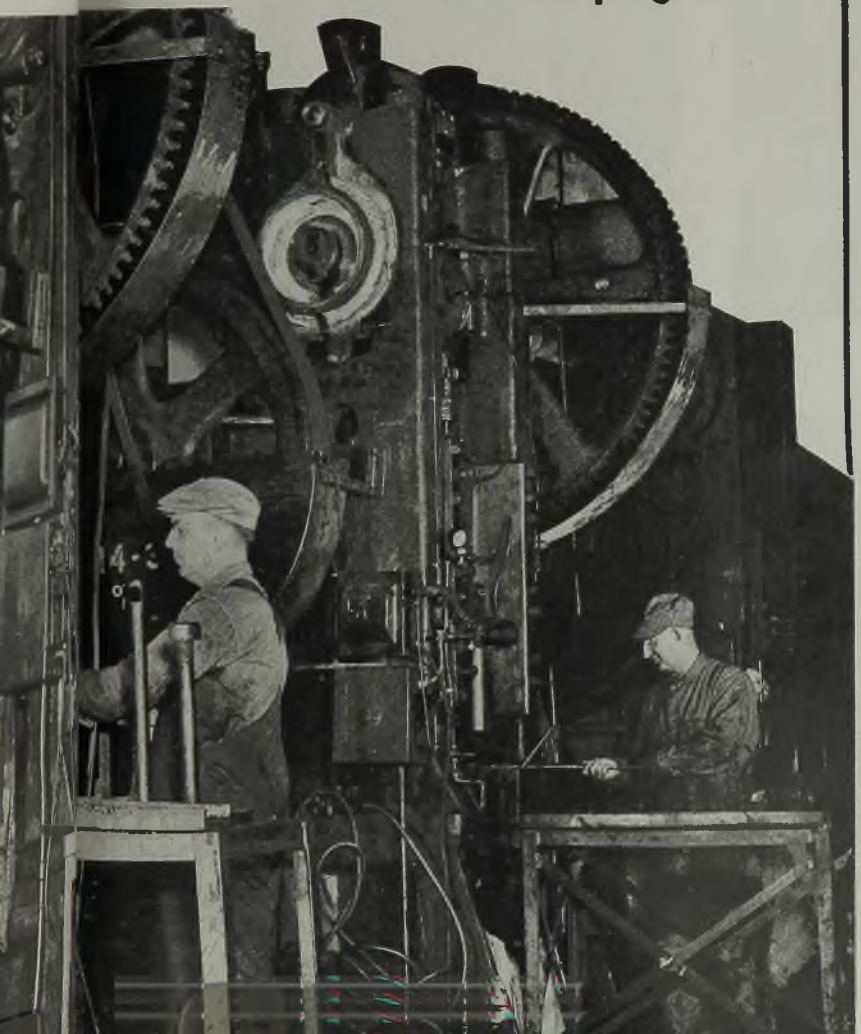
...ys with heat treatment, and the result-...ng cartridge cases were eminently sat-...factory. The firing of these cases was ...ccomplished in November 1941, and it ...s interesting to note that several of the ...amples were fired repeatedly with no ...detrimental effects and at pressures far ...eyond anything that could be accom-...plished with brass cartridge cases.

It was unfortunate that, in addition to ...he critical situation existing in copper, ...n even more critical situation was pres-...ent with regard to the alloying elements ...uch as chromium, nickel, molybdenum, ...tc., so the decision was rendered that ...plain carbon steel with rather limited ...quantities of manganese must be used. Experimentation then was directed toward the possible processing of medium-carbon steel with manganese as the added element. Fair success was enjoyed with small quantities of cases made from such steel, although not as good as with the alloy cases.

In March 1942, the situation in copper became so critical as to make it necessary to enter into, or at least initiate, a program for the production of steel cartridge cases in spite of the fact that little art and no science existed to lead the way. During the first three months of 1942, a large number of contracts were placed with manufacturers, most of whom were steel processors. These contracts were strictly developmental and were issued in the hope that from each of the contractors would come some bit of information which could be added to our meager knowledge and assist in the culmination of a process of processes which would permit early production. Many of the companies assisting in the research program accepted production contracts and proceeded on the basis of the knowledge available to procure equipment.

Many Deep Drawing Problems

. . . solved successfully in setting up steel cartridge and shell case program



In May, 1942, the Cartridge Case Industry Committee was formed. This committee consisted of representatives of Corcoran-Brown, Mullins Mfg. Co., Briggs Mfg. Co., Buick Motor Division of General Motors Corp., Norris Stamping & Mfg. Co. and Chase Brass & Copper Co. This group, together with the deputy chairman of the committee (an Army representative), acted in a broad advisory capacity to aid in the direction of the program as a whole. Four subcommittees were formed, each committee handling a group of calibers of technical similarity. Each assistant chairman of these subcommittees was a key man from one of the leading contractors engaged in the particular caliber group formed. These committees were extremely active, meeting frequently for discussions leading to the solution of technical problems as they arose. They gave unstintingly of their time and energy and placed at the disposal of all the contractors the benefit of their own experience, even going so far as to exchange personnel or any other aid which would further the completion of the task.

Steel Producers Form Committee

The producers of the steel to be used in the manufacture of the cases also formed a committee, and the membership represented top-flight metallurgists and executives from the several companies. A similar committee was formed by the manufacturers of the phenolic finishes which were used for coating the finished cartridge cases. The manufacturers of tungsten carbides also formed a technical committee to provide the maximum possible interchange of information in the manufacturing of dies for the task. Associated with the assistant chairman of each of these subcommittees was an officer from the Ordnance Department. It is most interesting to note that in almost every case the membership of the committee included representatives of companies which, in their normal peacetime pursuits, were keen competitors. However, in so far as the operations of these committees were concerned, competition was entirely forgotten. No item of information was withheld from any-one, and the greatest possible co-operation existed at all times. Within the experience of the writer, never has there been more wholehearted co-operation or a greater singleness of purpose to tackle and beat one of the most difficult tasks ever presented to American industry.

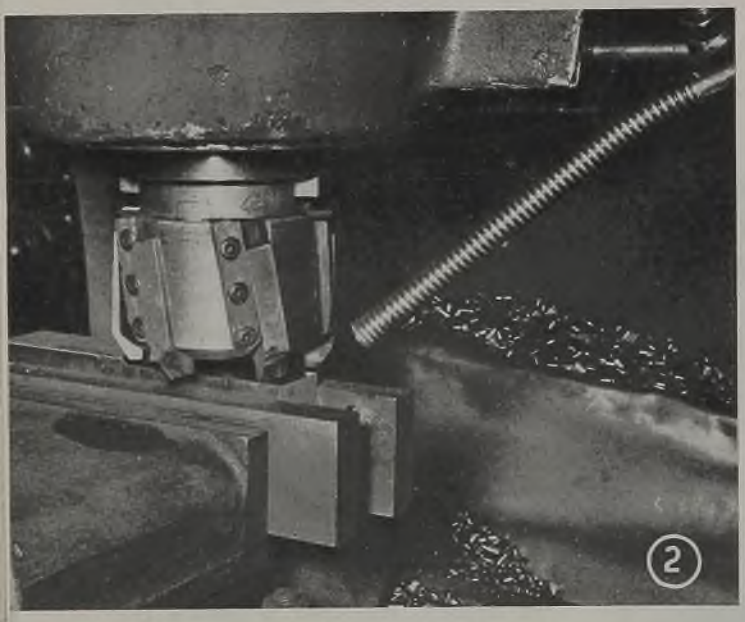
The accomplishment of making cart-

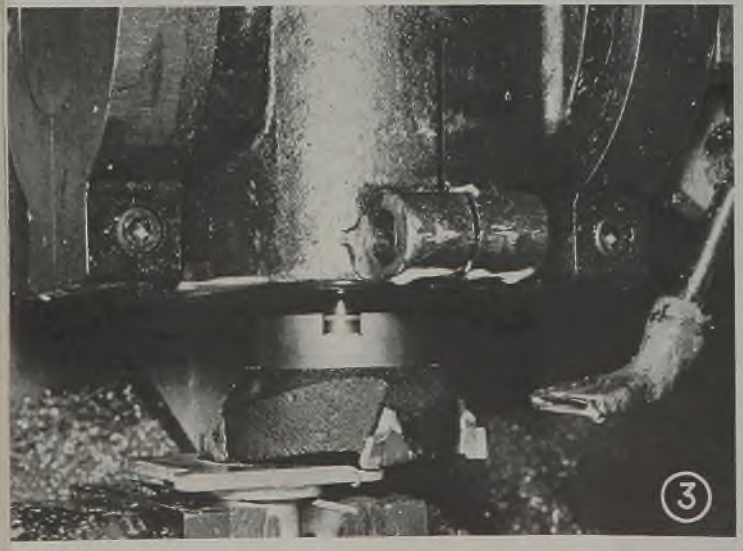
(*Please turn to Page* 114)

New Records in Face Milling

. . . roll up when coarse tooth, carbide tipped cutters—some with negative rake, others conventionally ground — are "given the gun" on steel as well as light metals

By GUY HUBBARD
Machine Tool Editor, STEEL





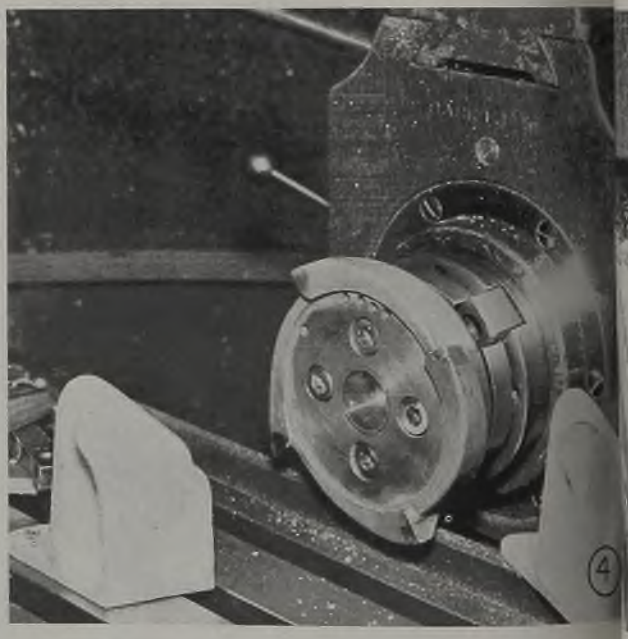


Fig. 1—This action picture made at Greenlee Bros. & Co., Rockford, Ill., shows a 5-tooth negative rake cutter, 6 inches in diameter, facing a 1095 steel forging—un-annealed—which brinells up to 300. Photo courtesy ASME and WPB

Fig. 2—At Boeing Aircraft Co., Seattle, this 6-tooth, negative rake face mill "takes in its stride" 0.200-inch cuts across 1⅝ x 9-inch 4340 steel gibs which brinell 321. Photo courtesy ASME and WPB

Fig. 3—This is a Hy-Cycle setup at Vega Aircraft Corp., Burbank, Calif., for machining aluminum sand castings.

ADVANTAGES of face milling—including straddle milling—currently are being emphasized by many metal cutting authorities, including those on the engineering staff of the Carboloy Co., who are intimately associated with super-speed milling developments.

Under the title, "End Milling Gets the *Speed-Up*", I dealt with some of the high-speed applications of small diameter cutters when used for face milling. That article appeared on Pages 100 and 102 of the March 13, 1944 issue of STEEL. Since that time, I have been given access to the file of case histories collected and compiled by the Manufacturing Engineering Committee of the American Society of Mechanical Engineers and released through the Office of Production Research and Development, War Production Board, Washington, D. C. This courtesy on the part of ASME and WPB now makes possible further consideration of the subject in connection with face milling cutters of larger diameter.

The data and illustrations thus made available, bring out actual performance under day-in-and-day-out production conditions in a number of nationally-known plants. This presentation is made primarily with the idea in mind that methods which are successful in speeding up vital war jobs in one plant can be applied with equal benefit in many other plants handling similar kinds of work. At the same time, the postwar implications of such performance as this must not be lost sight of by production engineers, cutter manufacturers and machine tool builders.

The technique, variously known as "high-speed milling", "super-milling" or "hyper-milling", is no temporary wartime expedient. The theories underlying it, rapidly are being brought to light through scientific research at California Institute of Technology, University of Michigan and other institutions of similar caliber, as well as in the laboratories of a number of industrial organizations. It behooves those having postwar stakes in the milling field, to get hooked up without delay to the "pipe-lines" through which dependable information on the new milling technique is flowing.

Without further ado, let us consider some of the "samples" which the writer has tapped out of the ASME-WPB "pipeline", one which incidentally continues to carry a generous volume of high-speed milling information to several hundred vital war plants which are tied in with it. From this growing wealth of material,—digests of which in the form of illustrated data sheets—have been and are being "sent along the line" to those industries tied in with this ASME-WPB information system, the following face-milling case histories have been chosen as most pertinent to this article.

Inasmuch as many of the earlier sensational instances of high-speed milling were on light metal parts (airplane spars particularly) in special machines of rather unorthodox design, too many people have the idea that the technique applies only to aluminum and magnesium alloys. I also might have had that idea but for the fact that something over a year ago, Joseph Armitage, vice president in charge of engineering, Kearney & Trecker Corp., introduced me to high-speed milling by demonstrating what—in a suitable machine—carbide-tipped, negative rake, face mills can do to a hard, tough steel forging.

This was one of those jobs which, according to the old theories, "couldn't be done because the work was unmachineable". However, there it was—a production job, hot chips coming off at a great rate but cutter and work cool, and with finish which looked more like that of surface grinding than milling. This particular job happens to be surrounded by governmental censorship restrictions, so to prove my point to the skeptical, I have hunted up two instances of "something just as good", the first of which is presented herewith as Fig. 1.

This action photograph was made in the tool shop of Greenlee Bros. & Co., Rockford, Ill. The 6-inch diameter, 5-

(*Please turn to Page* 144)

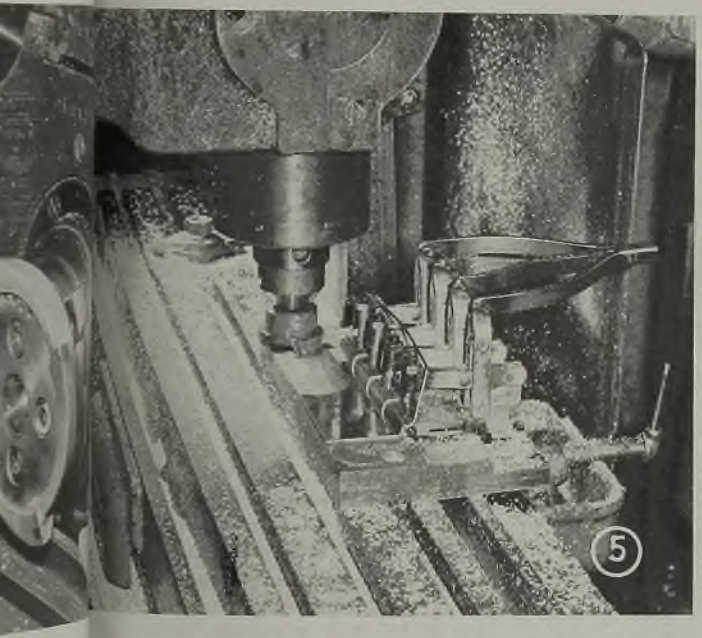


Fig. 4—Vega Aircraft Corp. faces off these Dural brackets with this 6-inch coarse tooth cutter. Running at 1800 surface feet per minute, at 30 inches per minute feed, each tooth carries chip load of 0.007-inch to a depth of 0.030-inch. Vega photo, released by Aircraft War Production Council; ASME and WPB

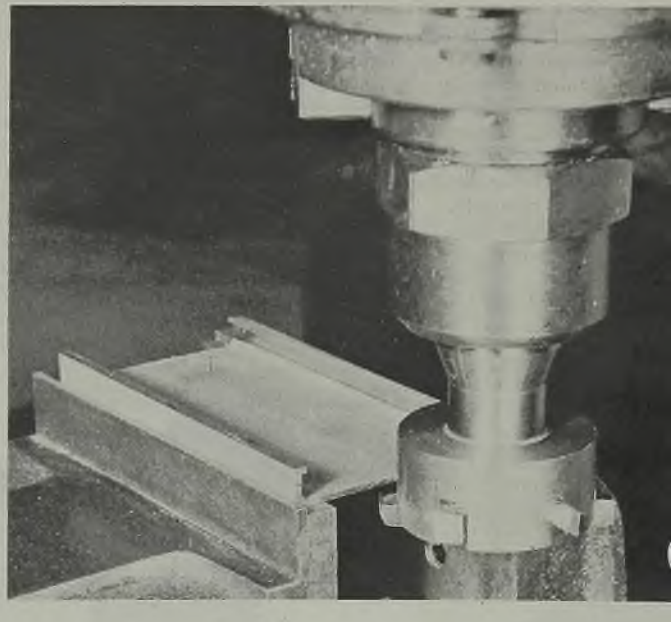
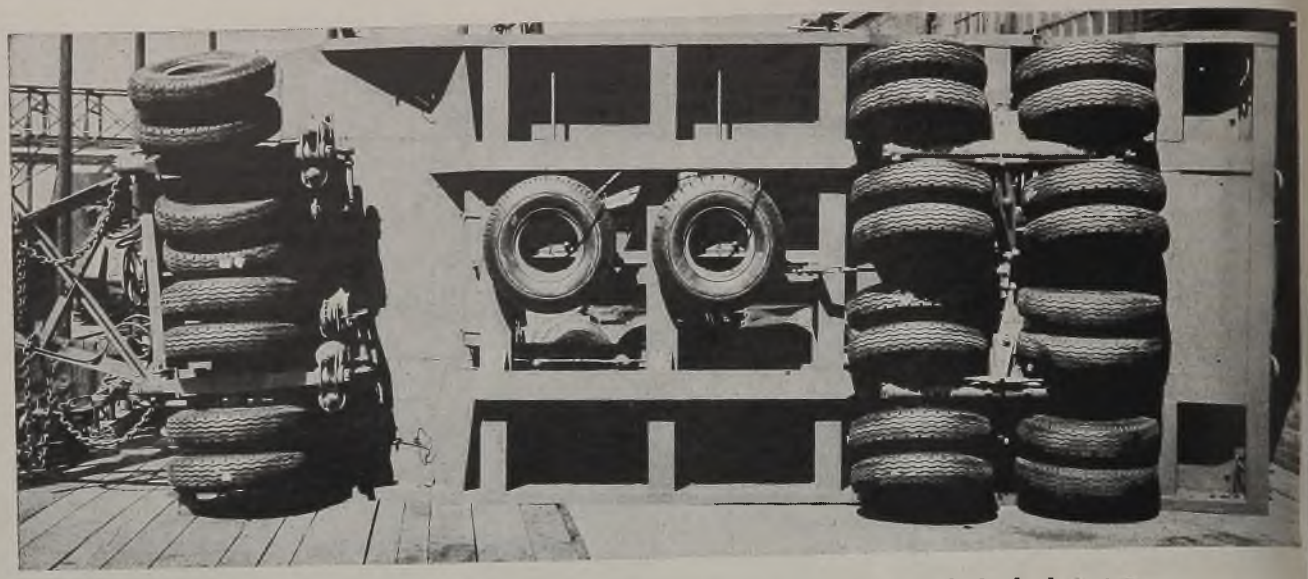


Fig. 5—Another Hy-Cycle job at the Vega Aircraft plant. Here a 2¾-inch cutter running 8000 revolutions per minute, with feed of 150 inches per minute, takes a scarfing cut 0.050-inch deep across a 24 ST aluminum alloy plate. Vega photo, released by Aircraft War Production Council; ASME and WPB

Fig. 6—In this setup by Consolidated Vultee Aircraft Corp., San Diego, a 6-tooth flycutter operating on 24 ST aluminum alloy sections, mills three surfaces at one pass —two teeth being assigned to each surface. At 1500 revolutions per minute, cutting speed is 1600 surface feet per minute. Feed is 40 inches per minute. Photo courtesy ASME and WPB



(Above)—The 45-ton load is distributed through 24 tires carried on 12 dual wheels in turn mounted on 6 axles with special load distributors between the two pairs of axles in front and the four pairs of axles in the rear—all visible here in bottom view of the tank retriever

Job Shop Emerges...

as full line manufacturer through experiences in producing 45-ton tank retrievers. Know-how will prove useful in postwar work

By G. ELDRIDGE STEDMAN

THOUGH many regard Denver as isolated industrially, 86 Denver manufacturers normally ship their products to 80 or more foreign countries throughout the world. Companies there are building fighting ships for the Navy and landing barges for the Army as well as many other war products.

The Winter-Weiss Co. in Denver is an outgrowth of a partnership formed in 1923 to make heavy-duty delivery, dump truck, and other types of special bodies and trailers. Largest organization of its type in the Rocky Mountain region, it employs over 350 metal and woodworking craftsmen. A typical war job is the fabrication of the 45-ton 12-wheel tank trailer for the transport and recovery of Army tanks. The company does other miscellaneous work, such as the construction of engine sections for the LCT and parts for DE vessels.

Its postwar plans are sound and ambitious, war experience having developed facilities in mass production that are destined to lead to considerable enlargement of activities, particularly in the agricultural equipment field in such designs as the varied beet truck and special bodies for heavy duty trailers. Some of its equipment was used extensively on the Alcan Highway construction.

(Below) — Retriever side rails flame cut along template layout lines prior to preforming operation in "squeezer"

The plant occupies about 4 acres with 71,000 square feet of factory floor. It has access to six railroads and maintains two sidings. The property is above the railroad level, so incoming material is handled by a 60-foot, 300-foot-travel, 12-ton cantilever full gantry crane. A second crane of same capacity, 40 feet wide and having a 400-foot travel, accommodates the processing sequence.

The 45-ton tank transport trailer, known as the M-9, is produced in quantity. This has a 187-inch wheelbase, requires 24 tires (2 spares in addition), is equipped with Bendix-Westinghouse air brakes and hand-operated parking brakes. Its three major assemblies are: (1) Front dolly, (2) rear bogies, (3) main frame. It is equipped with heavy tackle and turnbuckles to lash the tanks down, chock blocks to wedge front and back held in position by large J-bolts. Most of this tackle is fabricated by the company in its own thoroughly equipped machine shops, the policy being to produce everything that cannot be secured on schedule from outside.

A HIGH SCORE CAN MEAN GREATER ADVANTAGES *for your Postwar Products*

Test Yourself on these Questions about the Selection and Fabrication of Stainless Steels

The postwar designer will find many distinctive advantages in using Carpenter Stainless Steels in new or redesigned products. Whether he desires high strength/weight ratio for utility purposes, or extra beauty for eye-appealing consumer products, or special physicals for special jobs, these Stainless Steels can fill the bill—and do it at reduced costs.

Below, we have listed some of the questions which frequently arise in the discussion of Stainless Steel. Check your answers and compare them with those at the bottom of the page.

1 **For highly stressed structural parts, Stainless grades are readily available which provide good toughness, plus tensile strengths as high as:**

- ☐ A—400,000 lbs. per sq. in.
- ☐ B—200,000 lbs. per sq. in.
- ☐ C— 50,000 lbs. per sq. in.

2 **The maximum Rockwell hardness which can be obtained in any Stainless grade is:**

- ☐ A—C-60
- ☐ B—C-40
- ☐ C—C-30

3 **Selenium added to a Stainless alloy gives the steel:**

- ☐ A—Greater strength
- ☐ B—Ability to harden by heat treatment
- ☐ C—Easy-machining qualities

4 **Even when dead soft annealed, all Carpenter Stainless Steels run stronger and harder than soft low carbon steels by at least:**

- ☐ A—10%
- ☐ B—50%
- ☐ C—30%

5 **Which Stainless is recommended as providing greatest protection against intergranular breakdown at elevated temperatures:**

- ☐ A—Carpenter Stainless No. 4 (Type 302)
- ☐ B—Carpenter Stainless No. 4-Mo (Type 316)
- ☐ C—Carpenter Stainless No. 4-Cb (Type 347)

6 **Which of the following Stainless Steels can be hardened by heat treatment:**

- ☐ A—Carpenter Stainless No. 2 (Type 420)
- ☐ B—Carpenter Stainless No. 3 (Type 443)
- ☐ C—Carpenter Stainless No. 4 (Type 302)

7 **The corrosion resisting qualities of Stainless Steel will be impaired by:**

- ☐ A—Cold working
- ☐ B—Carburizing
- ☐ C—Immunizing

8 **In figuring the economy of using Stainless, a cubic inch of this metal will weigh less than the same volume of nickel or copper base nonferrous metals by about:**

- ☐ A— 4%
- ☐ B— 7%
- ☐ C—10%

The men responsible for the development of postwar products will find it to their advantage to have the correct answers to these and many other questions on Stainless Steels. Our 98-page book, "Working Data for Carpenter Stainless Steels", provides complete information about many Stainless Steels—tells how to use them to best advantage. For a copy, drop us a line on your company letterhead indicating your title.

CORRECT ANSWERS	
1. B	5. C
2. A	6. A
3. C	7. B
4. B	8. C

The Carpenter Steel Company • 139 W. Bern Street • Reading, Pa.

Carpenter STAINLESS STEELS ...for Strength, Rigidity, Heat Resistance, Corrosion Resistance, Longer Product Life, Sales Appeal

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

(Top, left)—The yard is served by 12-ton gantry bringing stock into adjoining plate shop

(Center, left) — "Squeezer" here holds rail to shape mechanically while it is solidly welded; insures complete uniformity of side rails

(Bottom, left) — The main assembly jig where parts are held in correct position. Only sufficient welding to keep frame aligned is done here. Then welds are finished on positioner

Raw materials consist of heavy I-beams, wide flange beams, bars, rods and plates of all structural shapes and thicknesses of plate from 16-gage to 1⅛ inches.

The work comes first to a burning station to be torch cut to dimension by oxy-acetylene flames. The company maintains portable Smith acetylene generators; receives its oxygen in drums from Denver Oxygen Co.; uses Smith gages, regulators and torches. About 50 per cent of the burning is by a motor-driven "little bicycle unit," Linde No. 40 equipment; most of the main and preformed members, cross and side pieces and deck plates being thus cut.

An unusual technique is the preforming of the 16 x 7-inch wide flange beam of the main member which is blanked out with templates, placed in an air squeezer, formed to shape and held until welded complete; assemblies coming out entirely uniform. This permits the development of two 17-foot 4-inch members from a 34-foot beam, an interesting saving in material accomplished by redesign of specifications so that blanks could nest together.

While the main members are passing through the burning operations, all flat plates and angles pass through shears and punch presses for shaping and holes.

The work then comes to the main frame-forming press of company design which is ingenious. Three railway air-brake cylinders are used, 6 inches in diameter with a 12-inch stroke and with air pressure at 110 pounds per square inch. This frame forming by compressed air bending is 100 per cent accurate and accomplishes the forming in one-fourth the former time. Forming includes main frame, center and side sections.

The work then moves to the stationary assembly jig for first treatment of main frame assembly. This also is a jig designed by company engineers. It is 12 feet wide by 24 feet long. The preformed pieces are laid in against stops and air clamped into exact position. These clamps employ eight air cylinders of the type previously mentioned, in reality being adaptations of the automotive Westinghouse 6 x 8-foot stroke, the same as are used on the tank transport brakes.

The main frame is built upside down in this 12-ton assembly jig, constructed of welded structural steel. No measuring or layout is necessary. The formed parts are squeezed into shape in about one-tenth the time required if the work were mounted on horses. After positioning by this squeeze, the assembly is partially welded with a technique more extensive than mere tacking. This prevents distortion completely in the subsequent movement of the frame by crane to the revolving positioners, next step in the operation flow.

This is a revolving 16 x 30-foot all-welded positioner. It includes a well rigged mechanism and series of platforms. The axles of the positioner rest in bearings. The front end gears mesh with positioner gears to provide a full 360-degree movement, having an 8-position anchor, held and locked by a positioning pin. The entire mechanism is operated with a crank and makes possible 100 per cent downhand welding. Here the main frame receives complete welding.

A "duke's mixture" of welding equipment was noticed in use in connection with these revolving positioners, both alternate current and direct current welders from 400 to 600 amperes being employed. One-quarter inch, fast-running, coated rod is used with both continuous and skip fillets. Careful experimenting, approved by United States Army technicians, has permitted company engineers to improve

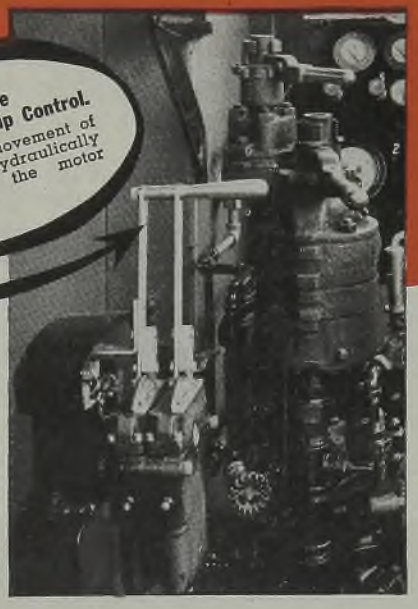
PORTER—DIESEL-ELECTRIC *Switchers*

and now—

FINGER-TIP CONTROL

- POSITIVE
- ACCURATE
- INSTANTANEOUS

This is the PORTER Finger-Tip Control.
The slightest movement of the throttle is hydraulically transmitted to the motor speed control.



To the progressive refinements constantly being incorporated in PORTER Diesel-Electric Switchers we now add FINGER-TIP CONTROL.

Utilizing the hydraulic principle of transmitting motion, PORTER'S Finger-Tip Control assures accurate synchronization of motors, and positive, instantaneous response to the slightest movement of the throttle lever in the cab. Finger-Tip Control eliminates troublesome rods, cables, pulleys, and turnbuckles, with their tendency to lost motion, back lash, and need for constant adjustment. Complete description and photographs on request.

LOCOMOTIVE DIVISION: Diesel, Diesel-Electric, Electric, Steam, and Fireless Steam Locomotives.

PROCESS EQUIPMENT DIVISION: Agitators, Mixers, Blenders, Ball and Pebble Mills, Autoclaves, Driers, Digesters, Condensers, Evaporators, Fractionating Columns, Heat Exchangers, Pressure Vessels, Tanks, Vulcanizers, Jacketed Fittings.

QUIMBY PUMP DIVISION: Screw, Rotex, Centrifugal, Chemical Pumps.

ORDNANCE DIVISION: Projectiles, Heavy Forgings, Breech Blocks, Winches.

ARMY E NAVY

PORTER "Better Built" Equipment
Established 1868

H. K. PORTER COMPANY, Inc.

PITTSBURGH, PENNSYLVANIA

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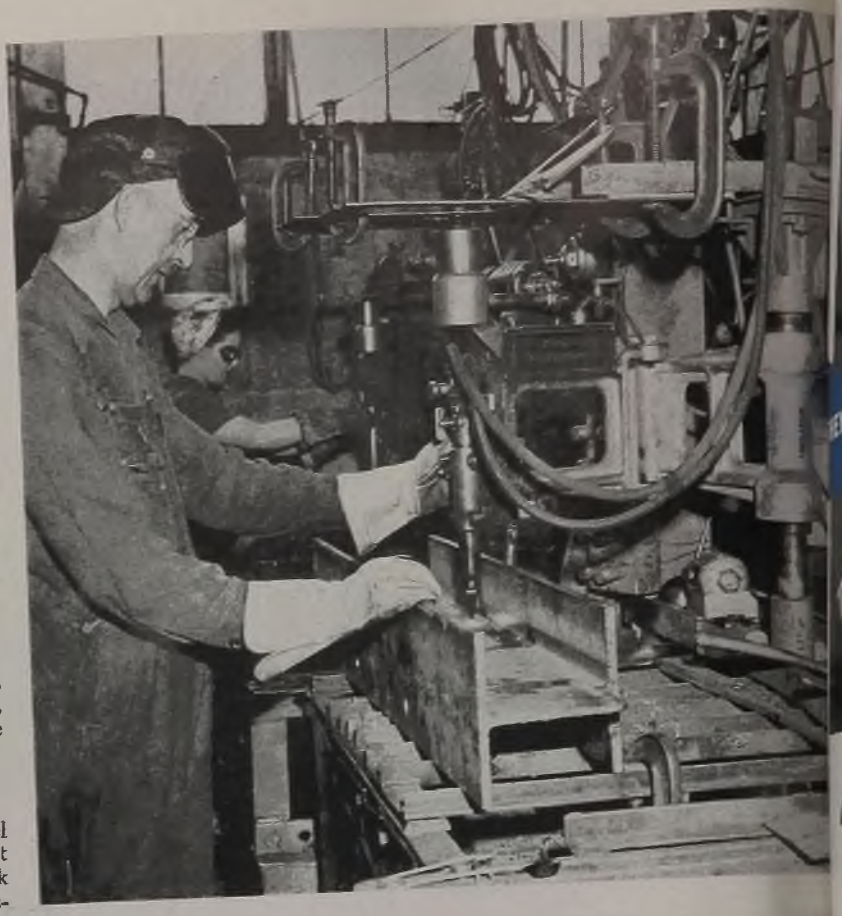


(Right) — Closeup of automatic cutting as employed for cutting out many intricate parts. Torch is guided by contact with magnetized follower on a template

welding technique such as to remove nearly 50 per cent of deadweight and still maintain a 100 per cent safety factor. Overall saving by this engineering has reduced the poundage of this main frame assembly by more than 1 ton.

One welding positioner is used for clean-up; the spatter and slag being scraped and cleaned preparatory to painting. The entire layout uses four positioners with a crew of three welders each. The slagging crew moves with the work, cleaning up at positioner stations as the welders finish.

The work then comes to a stationary fixture in a right-side-up position for the installation of brakes, electrical apparatus and other accessories. These include such details as lights, cable rollers, sheave wheels, tackle blocks, skid troughs, and angle iron guides which hold the tank in tracks.

Special Dollies Take Over

The assembly is then moved on to steel frame dollies with grooved wheels that run on an inverted angle iron track through the paint shop and to final assembly. A unique feature of this track, in the 90-degree turn it has to make, is that the inner track rail wheels roll on a flush plate to accommodate the shortness of the arc, the outer rail wheels alone taking the bearing in turn.

The work receives two paint coats applied by spray gun. All subassemblies and minor parts are given a degreasing bath prior to painting. This is a hot bath, fired by the waste from the company woodmill.

The newly painted frame comes to an outside dock for final assembly. Here the brakes are installed and other inspections are made. The installation of chocks, ramps, dollies and bogies is accomplished and the tank transport is set on its own wheels for shipment by flat car. These units are also being crated for export shipment in two units.

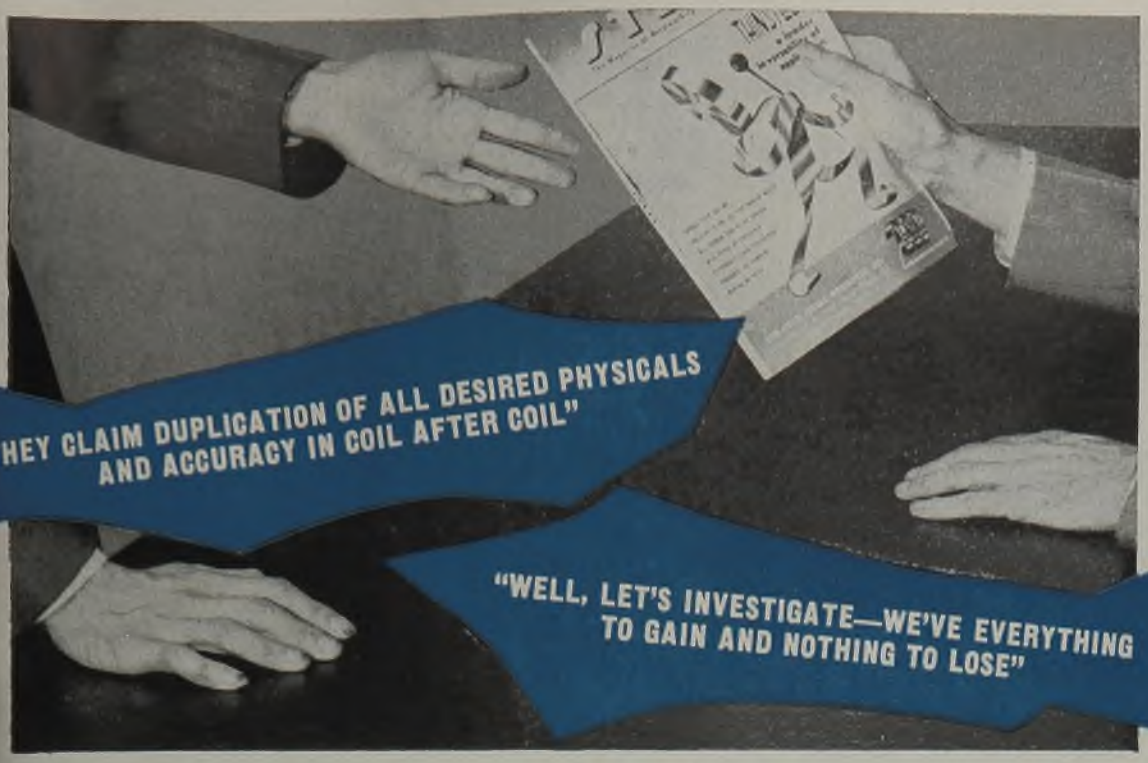
Plant maintains a fine machine shop, much enlarged to take care of this work, an additional facility which the company intends to make much use of after the war. The rear bogies and front axle subassemblies of the 45-ton tank transport are assembled in bays of this shop, being thereafter dollied or monorailed to meet the main assembly at the paint shop. The raw materials and rough castings concerned in these subassemblies are received from suppliers or from the plate cutting section and machined in this department. Then they are returned to the stockroom to be issued to these subassembly lines. This centralization of receipt and issue provides excel stock control.

Winter-Weiss machines more than per cent of the small parts of these assemblies, being forced to set up its facilities because of the difficulties ranging with outside suppliers for of the work. Its machine shop equipped for thorough work in ma shaping, and working with engine turret lathes, radial drill presses, b driven hack saws, Camograph cutti pattern. The two automatic cutter interesting in that the pattern is fol by a magnetized wheel which guid torch in contour cutting. Tolerances ter than 1/32-inch are regularly obt

The Camograph is used to blan shapes for finish grinding. There are different shapes produced in the including many peculiar contours work varies to cover special large ers, brake levers, lock levers and dolly deck plates, cable roller b bearing brackets, ramp parts. Se this cutting concerns the blanki parts for watertight escape hatche engine foundations involved in fa tion of the LCT sections mentioned of the interesting uses of the cutti chine is blanking large turn wrenches which are machined fo tank transport.

Special feature of this tank tra is its heavy lashing equipment.

(Left)—Slagging positioner w weld spatter and slag are remov This is same type position used for finish welding



That's the way . . .

UT THINSTEEL TO TEST!

THINSTEEL FACTS

GAUGES THIN AS .001"
WIDTHS UP TO 24"
OILS UP TO 300 LBS. PER INCH OF WIDTH.
EMELY CLOSE TOLERANCES.
ARD AND SPECIAL TEMPERS.
STANDARD FINISHES.
RBON AND ALLOY GRADES.
DE RANGE OF PHYSICALS.

Product improvement and new design always present fabrication problems. Material specifications demand the most important initial decisions . . . bound by considerations of physicals, costs, fabrication adaptability and the product's finished appearance. To best prove all phases of profitable production planning, no better preliminaries are known than actual material sample fabricating tests. In cases where light gauge cold rolled strip steel may be under consideration, CMP, the *pioneer* in *precision* cold-rolling, perhaps can help you gain many fabrication economies. CMP will cooperate in supplying the right metal tailored to your job. And in your investigation of CMP Thinsteel . . . and actual tests . . . we're sure you'll find the answer.

HE COLD METAL RODUCTS CO.

SUBSIDIARY OF THE COLD METAL PROCESS CO.

OUNGSTOWN, OHIO

CMP STRIP STEEL
PRECISION COLD ROLLED
GIVES MAXIMUM PRODUCTION PER TON

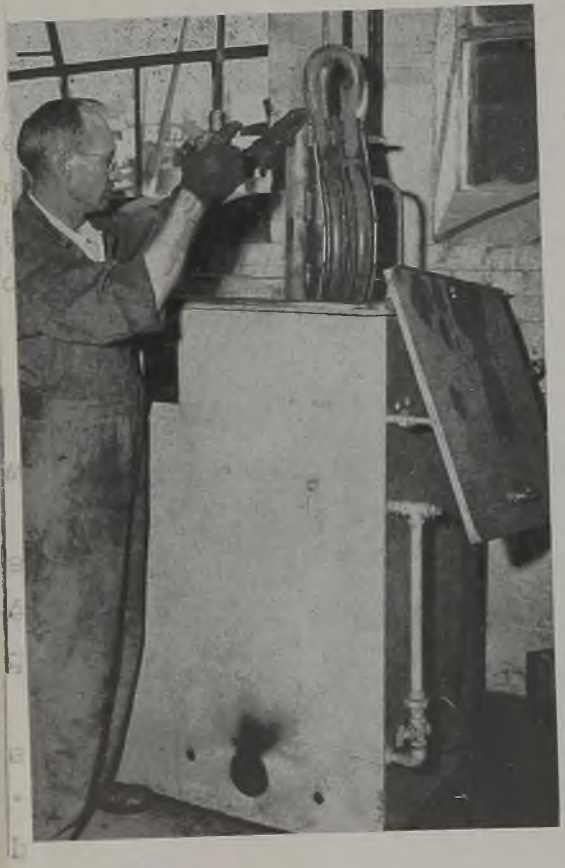
(Above)—Final assembly is done outdoors under single-legged gantry as shown here. Front dolly, rear bogies, loading ramps, tools, and lashing gear come together at this point

necessary to hold the Army tank it transports. Among this equipment are heavy turnbuckles, special 1-inch chains and large grabhooks. The company could not locate outside suppliers and therefore makes this equipment itself.

Body of the turnbuckle is cast steel, drilled and tapped. Eye bolts are forged, machined and threaded. The turnbuckle has a 16-inch body, 1½-inch eye bolts and a 12-inch take-up which requires a special end wrench with a 4-foot handle. Other special parts which couldn't be bought and which, therefore, are made in the plant are 2-inch and 2½-inch axle nuts, anchor and clutch hooks. Function of the latter is to adjust the length of the holding chain and to tie it into the lashing rings that hold the Army tank in travel position.

"Our war production has taught valuable lessons," Henry Winter, company manager, remarked. "It has turned us from a job shop into a full line manufacturer. We've learned plenty concerning mass production, inspection, machining processes, assembly engineering and materials handling. And we are enjoying this experience of becoming educated from all directions. We have designed and built a number of special machine tools. We have progressed far in electric welding from the production standpoint. All of this know-how will be very useful to us in our enlarged postwar activities."

Postwar plans are ambitious and diversified. Truck bodies of special varieties, trailer equipment of heavy duty nature, automotive delivery equipment appealing particularly to the baker and bottler, agricultural dump truck facilities of appeal to the sugar beet farmer as well as with special value in handling wheat and coal, together with specialized equipment such as power-driven winches for pole derricks, line construction truck bodies, earth boring and air compressor units. . . .all are in definite stages of engineering. "For example," George Pearson, chief engineer, remarked, "our research indicates that there are 40 special truck and trailer body designs interesting to the utilities for extension and maintenance of lines." That's getting right down to cases in postwar planning.



(Left)—Chemical degreasing tank where all accessory parts are cleaned before painting

Announces High-Speed Copper-Plating Process

A high-speed copper plating proc reducing operating costs and speed production is announced by E. I. Pont de Nemours & Company, Wilm ton, Delaware. A development of copper-plating process introduced 1938, new gains were made by sub tuting potassium cyanide and ot potassium salts for sodium salts with creases in current densities. It has b adopted for copper plating engine p and other articles and is useful as a st off or mask in selective case harden of steel parts. Portions of machine p are hardened to resist shock or wear, w copper-masked sections are left so and tougher.

Copper is valuable as a corro resistant plate, as an undercoat for d rative finishes such as nickel and c mium, and is easily buffed. Savings effected though potassium cyanide is c lier than sodium cyanide, as sm amounts of potassium salts maintain plating bath at required strength, dilute solutions give results equiva to stronger concentrations.

Desired deposit thicknesses are quired in shorter plating time by gre current densities tolerated by the bath, and are more stable and easier rinse. Increased speed and efficie give increased production without c responding increases in plating facili and reduce the size and cost of equ ment.

Presents Resume of the Art of Cokemaking

A brief history of the develop of the by-product coke oven, wi summary of the latest methods of ing as originated by Dr. Heinrich pers and developed to their present fection by the Koppers-Becker has been published in an 82-pag for private distribution by the Co., Pittsburgh. All illustrations ing 84, are presented in color adds to the attractiveness of the

Many designs of early beehive by-product coke ovens as well as trations of early types of by-pro ovens are presented in the forepar the book. Then follows in color ous longitudinal and transverse ings of the "gun-flue" and batteries of ovens as well as ser views of the gas nozzle and air gas ports, waste-gas recirculating vertical and cross-over flues.

The appendix deals with equipment such as, self-sealing concrete quench tower, oven ma oven construction and is profus lustrated.

Corrosion Prevention

. . . . improved by new wrapping system that protects packaged steel parts. Highly finished steel surfaces are protected against most severe shipping conditions

DEVELOPMENT of the "breathing" theory of corrosion prevention in wrapped steel products has been responsible for an improvement in packaging technique which has exhibited exceptional protective qualities.

According to engineers of the Angier Corp., Framingham, Mass., and other competent packing authorities, experiments have found a way to let packaged steel parts "breathe". Many tests have demonstrated that "breathing", as permitted by special improved wrapping materials, is an effective first-aid against contamination of steel surfaces by corrosion.

There are various types of wrapping techniques developed to minimize or prevent corrosion of packaged steel products.

One of the most common involves slushing or dipping the metal parts in an oil composition and then wrapping them immediately in protective moisture proof paper.

However, corrosion often occurs even with a perfectly sealed package, for moisture may fight its way out of pores in the metal or come from solvents in the oil compound in which the metal is slushed. Moisture may make its unwelcome appearance from many places . . . and does.

Under a tight fitting flat wrap, moisture is squashed against the steel surface and trapped there on a spot where the protective oil film may be broken. Corrosion then starts its deadly work.

However, by using a creped wrapping paper, little air channels are allowed to remain between points where the paper touches the steel. This provides room for the moisture to "wiggle out" and eventually evaporate.

But some method must be provided to protect the broken spot in the oil-film. This is done in a new type of wrap having the inside surface infused with a corrosion inhibiting compound which itself prevents corrosion and retains the excess slushing oil on the steel part.

Effective Wrapping Technique

This wrap includes several layers of material, not being a single sheet. The outside sheet of kraft has an exterior untreated surface to which gummed labels used for addressing, inspection, and other information will stick, as required by government regulations. Just inside this outer sheet is an oil barrier consisting of a sheet of cellulose acetate. Its purpose is to halt such portions of the slushing oil as may tend to migrate out of the package. This helps to retain the protective oil film on the wrapped article and prevents smearing exterior objects.

The combination of cellulose acetate sheet and outside kraft sheet is bonded to the infused corrosion-inhibiting sheet on the inside with an adhesive resinous compound.

The interior sheet of the inhibitive dual wrapper, as this type of wrap is known, consists of a 30-pound chemically neutral sulphate kraft sheet into which is infused a corrosion inhibiting compound by a special process which fills spaces between the fibers, at the same time forcing air and moisture from the paper. This resinous infusing compound is neutral, is chemically unalterable, not brittle, and bends naturally with the sheet.

This type of wrap will not scratch highly finished metal surfaces. Its oil content is similar in nature to that of the slushing oil, so one may "bleed" into the other without corrosive chemical reaction and without blotting up or breaking the oil film that protects the metal from corrosion.

Success of the new type wrap is indicated by excellent results being obtained in many war industries. Repair parts for aircraft engines and other highly finished steel parts must be shipped long distances. Wherever the destination, the parts must arrive in perfect condition if the packaging is to serve its purpose and the parts be useable upon receipt.

Severe Test Shows Success

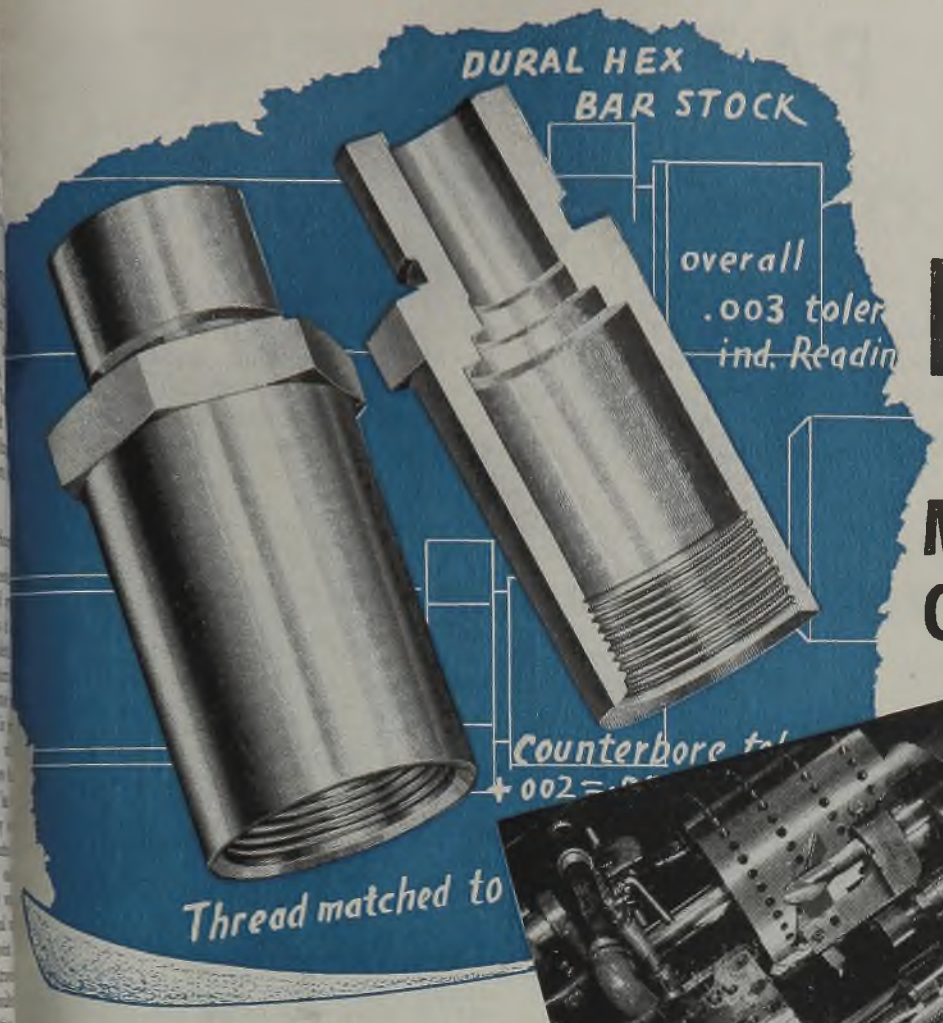
An indication of the successful manner in which the new type of wrap meets these requirements consists of an interesting test recently completed. Finger prints are fatal to most mirror-like surfaces of highly finished steel parts because the chloride (salt) in perspiration starts chemical reactions which result in corrosion. Yet, for more than a year a cylindrical steel part has been unwrapped and touched by hundreds of fingers in the various climates from arctic to tropic regions. After each exposure this widely traveled part was rolled up again in its inhibitive dual wrapper and shipped on to the next point.

After a year of this traveling, not a trace of corrosion has resulted, although the part has no protection except its original oil-film coating and the wrapper itself.

Of course, the record of success of this type of wrap lies in the treated metal contacting surface impregnated with the corrosion-inhibiting compound. It is the inhibitive material that counteracts corrosive acids and kills them off before they have a chance to begin their deadly work.

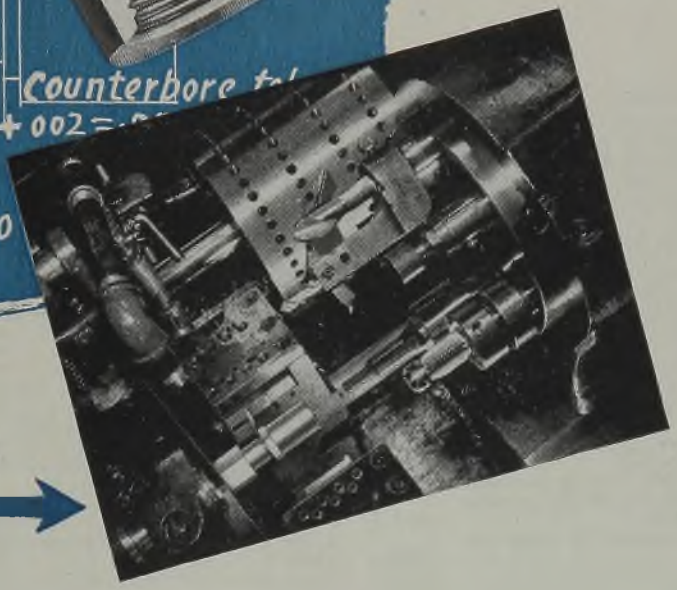
The corrosion inhibitive action of this special material has been likened to sulfa drugs and their action on human infection.

CLOG-PROOF TABLE: Need for a torch-cutting table in a welding shop of R. G. LeTourneau Inc., Peoria, Ill., elicited the novel idea taking shape as shown here —a top tier composed of nine pieces of 9-inch scrap tubing cut to 18-inch lengths and joined in a square by tack welding. When mounted in an angle-iron frame on pipe legs of 2¼-inch diameter, it forms a table 27 x 27 x 36 inches high, an ideal unit for supporting steel plate because it is clog-free. Sparks from the torch, scrap and slag are guided straight to the floor where the latter are removed easily with a shovel. When top gets rough and cut up from use, pipe unit can be turned over on the frame. After both ends are badly cut, welded tacks are broken, about 2 inches of metal trimmed off the ends of each pipe and tubing again is tack welded together for further service



This PART (as shown) MADE IN ONE OPERATION

WITH THIS STRAIGHT TOOLING ON A MODEL A 2½"



CLEVELAND AUTOMATIC

A "production headache" solved by use of the right equipment . . . made from Dural hex bar stock, with multiple I.D. and O.D., matching thread and tolerances held to .003, total indicator reading. First position (after gauge stop) center rough drilling and rough turning front O.D., with both tools mounted on the same station: Front body O.D. then finish-formed with front cross-slide: Next position rough drilling smallest I.D. Back O.D. finish-formed in one stage with rear cross-slide: I.D. then finished with counterbore (tolerance here +.002 −.000). Tapping done on last station and part delivered by the independent cut-off. Production rapid for this type of work.

THE CLEVELAND AUTOMATIC MACHINE COMPANY

CLEVELAND 3, OHIO

emember: CLEVELANDS CUT COSTS

Ask for Cleveland Bulletin on Automatic Production Equipment

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NEWARK (4): 902 American Insurance Bldg. HARTFORD (1): 529 Capitol National Bank Bldg.

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. 220 — METALLIC RECEPTACLES

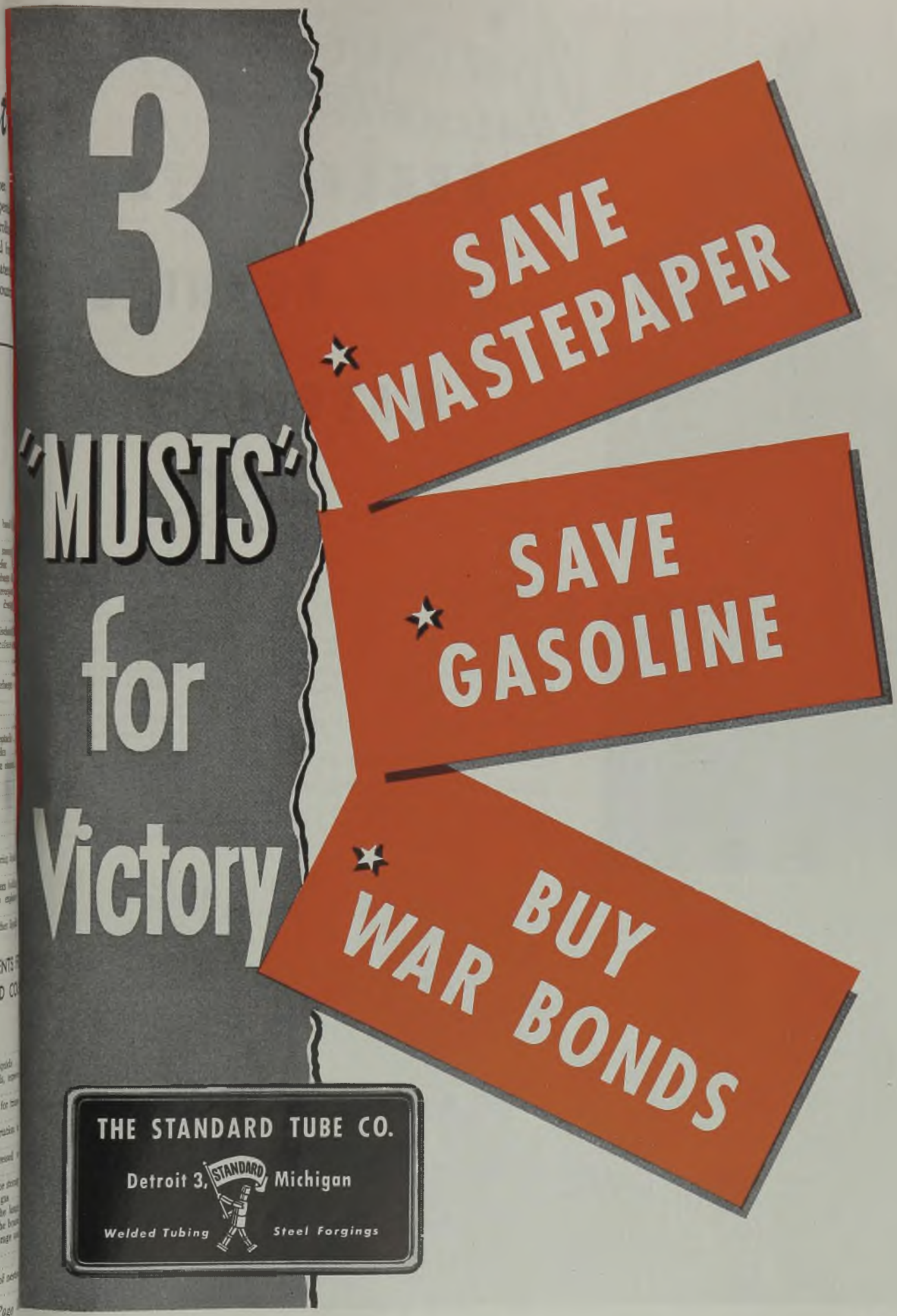
LIST OF ENEMY PATENTS

DESCRIPTION	PATENT NO.
Spherical container for storing fluids such as gas and liquids	2156400
Shell shaped body suitable for the allowance of high pressure stresses	1645944
High pressure gas developing cartridge	1753871
High pressure joint for pressure vessels	2029606
High pressure vessel	2253093
Cooling and freezing vessel	1603474
Double-walled vessel	2043183
Metal drum	1800082
Metal drum	1888899
Metal drum	1904755
Metal cask	1956512
Refuse receptacle	1877099
Container	1644821
Smoker's ash receptacle	1743507
Rubbish receptacle	2213915
Partition means for fluid containers, particularly for dyeing machines and the like	1669333
Device for subdividing liquid containers	1758335
Bronze and tincture container	1731847
Packing device for pressure vessels	1665827
Expansion plug for barrels and other tanks, fire tube and water tube boilers	2101030
Sheet metal container	2138061
Manhole closure	1603998
Steam boiler	1656559
Sealing piston for reservoirs for the storage of gas, steam or easily evaporating liquids	1693468
Sealing piston for reservoirs for the storage of gas, steam or easily evaporating liquids	1722863
Sealing means for fluid storing containers	1865969
Tank roof	2006505
Peripheral sealing means for tanks	2108380
Closure for heat insulated containers	1988223
Cooking utensil with hinged and removable lid	1633494
Sheet metal container	2107212
Tea container	1896981
Container for storing frying pans	1964815
Hinged closure for petrol tanks	2113484
Dustbin	1811165
Bung for iron transport casks	1737605
Washout plug	1774889
Closure means for tin boxes	1925503
Bung closure for metal vessels	2008079
Tin with tightly closing cover	1624901
Sheet metal container	1869511
Closing means, more particularly for milk cans and the like	1922789
Tin opener	1608455
Valve for preserving receptacles	1674506
Seal	1839340
Cover closing for steam barrels, heating boilers and the like	1889606
Closure for high pressure vessels	2257213
Closure for discharge openings	2014041
Tin opener	1709736
Closing device for tins	1950065
Metallic cover for boxes, tins, flasks, and the like articles	1952487
Closure for receptacles	1617076
Steam cooking apparatus and closure therefor	1844970
Steam cooking pot	1846964
Closure union and adaptor	2232494
Closure for pressure vessels	1821726
Electric accumulator	1913908
Cam lever closing arrangement for pressure cooking pots	1945752
Box	1693150
Housing of electrical switches or distribution boxes	1919432
Closure means for tins	1919574
Sealing means for sheet metal containers	2026002
Tension ring closure for packing containers	2078009
Closure for packing containers	2116841
Metal barrel	1709701
Electrodeposited cooking utensil	2034057
Steam and water collector for high pressure boilers	1605229
Containers such as barrel, drum, or the like	1597324
Container such as barrel, drum or the like	1683788
Liquid tank or container for use in vehicles and aircraft	2269617
Method of re-enforcing the walls of packing cases	1667793
Closure means for manhole openings in steam boilers	1632957
Container	1664985
Metal container	2122105
Casing for electric transformers and the like	1678090
Fuel tank arranged on the dashboard of motor vehicles	1837845
Fluid tight glass closure for metallic containers	1975703
Tank for transportation of volatile liquids	1775484
Fire prevention device for storage tanks	1974034
Protecting cap for the valves of pressure gas bottles	2216717
Safety device for containers for explosives, particularly explosive gases	1918906
Explosion safety device	2170937
Electrolytic condenser	2198988
Handle supporting closure band for vessels	17869
Insert for preserve tins for sausages	18221
Bobbin bin and shelf therefor	16229
Device for emptying garbage bins into garbage collecting receptacles or carrying off cars in dustproof manner	16478
Device for the dust free discharge of circular dustbins into refuse collecting carts	17153
Refuse handling apparatus	17529
Chute device for ash, garbage and dust bins	20966
High pressure container	23124
High pressure vessel	23261
Shipping and storing receptacle	16742
Cover for refuse receptacles	20790
Lid cover stopper and like closure	19719
Steam pressure cooker	18349
Key opening can	2313
Steam pressure cooker	17659
Closure for vessels	16329
Closure for receptacles	16739
Barrel and like container	16739
Process and device for storing liquids sheltered from air	2313
Safety device for containers holding liquids which develop explosive gases	18169
Receptacle for petrol or other liquids	23059

LIST OF PATENTS FROM ENEMY-OCCUPIED COUNTRI

DESCRIPTION	PATE NO
Closure for vessels	1650
Large sized reservoir for liquids	1654
Tank for storage of liquids, especially hydrocarbons	2031
Freight handling container for transportation of goods	18
Container for the transportation of goods	209
Device for closing compressed or liquid gas cylinders	1632
Method and apparatus for the storage and the transportation of gas	1651
Arrangement for securing the longitudinal binding wires in the bound recipients used for the storage and transportation of gas	1795
Reenforced gas container	1801
Multiple ash tray composed of nested elements	1886

(*Please turn to Page* 112)


3
"MUSTS"
for
Victory
SAVE
WASTEPAPER
SAVE
GASOLINE
BUY
WAR BONDS
THE STANDARD TUBE CO.
Detroit 3, Michigan
STANDARD
Welded Tubing
Steel Forgings

Postwar Importance of BENEFICIATED IRON-BEARING MATERIALS

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VOLUME of production has been the primary motive of every blast furnace operation since the beginning of World War II. When the time comes to return to the normal competitive conditions of peacetime operation, operating economy most certainly will become the primary motive.

It seems reasonable to assume that with postwar operation there will be som of the same conditions to be met as fo lowed World War I. Those who oper ated blast furnace plants through th 1930's know what the operating prob lems of the slack business period wer and probably without exception, all fer vently hope some means will be found t alleviate those problems if a like perio develops after the present war. The in tensive effort being given to the study postwar operation by most of those re sponsible for blast furnace manageme is the best evidence of the importance the subject. The problems which conce management are not only those of the in

(Left)—A grab of stockpile ore

(Below)—Over 1½ million tons of beneficiated ore in storage at a blast furnace plant in the Pittsburgh district

Washing and screening of iron ores as well as fine grinding to obtain high-iron concentration followed by sintering are being studied closely by blast furnace operators. Wider use of beneficiated materials in the immediate future may force a change in blast furnace operation. Factors governing furnace productive capacity with a soft ore burden and a full sinter burden are compared

mediate aftermath of the war but the probable developments within the industry in future years.

A division of the subject widely discussed and studied is the future supply of iron-bearing materials which can be melted economically in the blast furnace. It is now a matter of general knowledge that the deposits of ore at the head of the Great Lakes which are rich enough in iron to be used economically in their natural state will be exhausted in a relatively few years, and with the exhaustion, *or the approach to it*, the leaner ores of the region must be beneficiated by some means to make their use economical. The urgency of this need will vary with the ore reserves of the various blast furnace plants but the trend of the industry appears to be definitely toward the use of beneficiated iron-bearing materials; the effect of such materials upon blast furnace practice methods and operating economy is therefore an important phase of the subject.

Raw material cost is the largest item of pig iron cost and the iron-bearing materials are the largest subdivision of that item. Since the cost of ore beneficiation must be absorbed in the raw material cost, the nature and extent of the beneficiation is important to the operating economy and should be of a nature which will permit a reduction in smelting cost to offset the cost of the ore beneficiation. Fuel cost is the second largest item of raw material cost and the fuel rate is a most important factor in smelting cost. Since there is not anything to indicate any prospective reduction in fuel production cost, the importance of the fuel rate to the furnace operating economy therefore is emphasized greatly.

Ore beneficiation may be partial or complete and it seems reasonable to say the degree of effect upon the blast furnace operating practices and economy will be entirely dependent upon the degree of beneficiation.

A washed ore is a beneficiated ore and a large tonnage of Lake ores are now so beneficiated. With this method the extent to which the iron content can be concentrated is largely dependent upon the amount of iron that can be sacrificed economically with the tailings, and the economy of the process is limited by the selling price of those ores with which the washed ore must compete. Since the salable product of this process is comparable to the naturally rich ores the effect of it upon the blast furnace operation is not any different than that of the naturally rich ore.

Beneficiating Methods Vary

A screened ore is a beneficiated ore and an increasingly large tonnage of Lake ores now are so treated. The removal of the fines from these ores provides a product which permits a more uniform passage of gas through the furnace shaft and so contributes to a smoother furnace operation, but definitely, the practical economy of the process depends upon the recovery of the iron values in the fines removed by the screening. Sintering the fines recovers the iron values but the sintering operation produces a product of entirely different chemical composition and physical characteristics from that of the natural ore which therefore causes it to have a different effect upon the furnace operation than the coarse portion of the ore from which the fines are screened.

The practice of the eastern magnetite mines of fine grinding to get high-iron concentration, followed by sintering to get proper physical preparation, is an example of full beneficiation.

From the foregoing it will be seen that beneficiating methods vary with the degree and extent of benefit sought and that full beneficiation is obtained by progressive steps. The first step is one of iron concentration and the character of the natural ore will determine the method needed for the concentration. With the first step the slag forming elements are reduced in proportion to the degree of iron concentration with a corresponding benefit upon the fuel rate for smelting, productive capacity, and the problem of slag disposal. The second step is one of processing the concentrate to effect further benefits which may be physical, chemical, or both. With this second step, further benefits are gained in furnace fuel economy because of the more effective use of heat for smelting purposes.

In addition to sintering, nodulizing and briquetting are receiving some consideration as a second step in the beneficiating of ores. All of these processes are old and all have been used in past years for processing blast furnace flue dust. That the sintering process is the only one of the three which has generally survived for that purpose is significant of the respective values in processing ores for blast furnace use. In this respect the sintering process is comparable to the blast furnace operation in that while many attempts have been made to develop methods for processing iron ore directly into steel none have been economically successful because none have been able to perform the part of the operation which the blast furnace performs as economically as the blast furnace.

Greatest Saving in Fuel

To sinter is to fuse and while the materials being sintered are only momentarily held in the molten state they are for that moment molten and the time element is long enough to completely eliminate all volatile elements. The melted mass then is frozen into a friable cellular product which with handling breaks up into particles of irregular size and shape to give the maximum ratio of surface to mass for contact with the blast furnace gas when the material is charged into the furnace. General sintering practice has proven that approximately 6.0 per cent carbon is the maximum fuel percentage which can be used successfully, and it is frequently less. Considering that the ores actually are melted, and conditions to the degree stated, for a maximum of 120 pounds of fuel per ton of ore, it is most difficult to conceive of a more efficient use of heat. The capital investment in equipment for handling and preparing ore for the second step in beneficiation would be approximately the same for any second step process, but the low cost of the fuel in relation to the benefits obtained with the sintering process is the barrier which all other processes must surmount if they wish to compete.

While productive capacity and operating economy of the blast furnace are closely allied, there are distinctive features of each. Every operation has certain fixed charges and the more units of product there are over which the sum of the charges can be divided, the lower the unit charge will be. But the largest tonnage is not always the most economical operation. If the margin of profit is large enough, some sacrifice in operating economy, such as fuel per ton of iron and flue dust losses, can be accepted because of the greater overall profit from a large number of units.

But if the margin of profit is small, no sacrifice can be afforded and maximum savings in fuel and flue dust loss may more than offset a slightly smaller output.

The character of the raw materials is a most important factor in the productive capacity of the furnace. It is a general practice to compute productive capacity upon the pounds of coke burned each 24 hours per cubic feet of furnace working volume. The formula (Southern Ohio Pig Iron Association) was developed from data compiled from numerous soft ore operations and is reasonably efficient for measurement or comparison of soft ore operations but it definitely is not applicable to a burden of fully beneficiated materials. This fact has been clearly demonstrated by several Eastern District full sinter burden operations where the fuel rate is consistently lower and the volume of production equal or greater than that of furnaces of equal dimensions using natural soft ore burdens. A comparison of operating practices between a full sinter burden and a full soft ore burden indicates that productive capacity of any given furnace is dependent (1) upon the amount of iron-bearing material which can be prepared for reduction and (2) upon the efficiency with which the heat generated is used rather than upon the amount of heat generated.

The effect of natural versus beneficiated iron-bearing materials upon the thermal principles of the blast furnace operation have been analyzed[1]. In that discussion sinter was used as representative of the most complete method of beneficiation since sintering effects both chemical and physical changes in the materials. The use of a fully beneficiated burden calls for a different conception of the use of heat in the blast furnace than that which is used with soft ore. The sintering operation performs the work upon the iron-bearing materials preparatory to the iron oxide reduction which the blast furnace would have to do in the top of the furnace if the materials had been charged into the furnace in their natural state. Consequently, the thermal requirements of the furnace shaft and hearth regions are different with sinter than they are with the natural materials. It is this difference which is the principal advantage of sinter to the fuel economy of the blast furnace operation because it permits the use of a heavier burden and higher blast temperature than is possible with natural soft ores.

[1] "Sinter—and Blast Furnace Thermal Principles," STEEL, Oct. 4, 1943.

PLANE-LAUNCHING GUNS INSPECTED: An inspection gage is being tried on a line of plane-launching catapult guns at the U. S. Naval Ordnance Plant, Canton, operated for the Navy by the Westinghouse Electric & Mfg. Co. When a blank shell is fired in one of these guns, the rapidly expanding gases of the explosion push against a piston which yanks a cart along the catapult track. A scouting plane sitting on top of the cart is tossed into the air from the deck of a battleship or a cruiser with this device

With a soft ore burden, the productive capacity of a furnace may be said to be governed by the capacity of the furnace shaft to prepare stock for the hearth. Because of the nature and amount of the preparation, maximum production of the furnace is best served with a light burden, a hard blowing rate, and fast stock travel. Production is gained—but at a sacrifice of fuel economy.

Output on Sinter Burden

When there is a full sinter burden the furnace productive capacity may be said to be governed by the capacity of the furnace hearth to smelt the material delivered to it from the shaft. Because of the ease of sinter preparation in the shaft maximum production is best served with a heavy burden, a lighter blowing rate and slower stock travel.

The governing factor of the soft ore practice appears to be the mechanical problem of disposing of the greater volume of the gas through the interstices of the stock in the shaft. The greater volume of gas is created by the hard blowing rate and by the release of the volatile elements contained in the soft ores.

The governing factor of sinter practice appears to be the thermal problem of supplying the amount of heat necessary to do the work of the hearth. The lighter blowing rate and freedom from volatile elements in the sinter produces a smaller volume of gas and assists in conserving heat within the furnace.

With the soft ore practice, the light burden is essential to the problem of gas disposal. In the sinter practice the ability to prepare the heavy burden for the hearth permits the use of higher blast temperature. The burden ratio of iron-bearing materials to fuel is the major factor in the fuel economy of any blast furnace operation. The difference between these two practice methods is of tremendous importance to the furnace operating economy, as presently practiced and in potential possibilities; it is well exemplified in the many soft ore operations of the Middle West District and the few full sinter burden operations of the Eastern District.

(Concluded next week)

Joining Aluminum Alloys

Soldering has been considered least as a method of joining light alloys, yet it comprises an excellent fabricating process in many instances. Where resistance to corrosion is a factor, other types of joining are advised. Previous articles covered riveting, welding and brazing

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SOLDERING of metals, as we ordinarily think of this process, consists of joining metallic components together by means of a metal or alloy having a melting point in the range of about 200 to 700 degrees Fahr. Merely bringing molten metal in contact with a solid metal surface, however, does not necessarily insure wetting or alloying which are requisite to metallic joining. The surface of the solid metal, being normally covered with oxide and impurities, no longer has forces available for initiating the wetting process, for these forces have been neutralized by the formation of the oxide and by the absorption of the impurities.

To permit metallic joining, these materials must be removed. The oxide and absorbed impurities present on the solid metal surface are sometimes removed mechanically, for example, by wire brushing. At other times, it is customary and generally preferable to employ a flux to remove or displace the oxide and to act as a protective cover to minimize additional oxidation of the metal surfaces.

Of the various methods used for making continuous metallic joints between metal components, that of soldering has been considered least in connection with aluminum and its alloys. This limited use of soldered aluminum joints in the past has probably been the result of a number of factors, among which may be mentioned the inferior flow characteristics of the solders and fluxes formerly used as compared with those used on other metals, the inherent property of aluminum and its alloys readily to form and permanently to maintain a refractory oxide film, and the position of aluminum in the electromotive series of elements which often subjects it to electrochemical interactions with other metals or alloys in contact with it.

Fig. 17—Shown here is an aluminum reflector soft-soldered to a brass light bulb base

The method of applying the necessary heat, and sometimes of supplying the solder as well, to the aluminum parts to be joined depends on the shape and size of the parts, the joint design, the appearance of the completed assembly, the equipment available, and so forth. In any case, the surfaces of the parts to be soldered must attain the proper temperature in order to insure satisfactory results.

Any ordinary electric or gas heated soldering iron may be used on aluminum in the same manner as on the other materials such as copper, brass, and iron, except that ordinary lead-tin solder should be used to tin the copper tip before using it and that an aluminum solder must be used for the joining. As with other metals, flame or torch methods may be used for soldering aluminum with the added precaution that the flame should be directed on the opposite side of the part from the joint, or near the joint, so that the heat to melt the solder is supplied by conduction and that the flame does not directly contact the flux and solder; a hot plate is particularly useful in this connection.

Fig. 18—(Left, below)—Microsection through a soldered joint made with a heavy metal halide flux and additional solder (about 100X)

Fig. 19—(Below)—Microsection through a soft-soldered joint made with a nonreactive flux (about 100X)