

STEEL

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Heavy drain on high-grade iron ore resources speeds research activity. Page 73

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NEWS

Iron Ore	73	WPB — OPA	87
Present, Past and Pending	75	Men of Industry	96
Steel Drive	76	Obituaries	97
War Production	78	Postwar Planning	98
Steelworks Operations	79	Engineering Ingenuity	100
Steel Control	80	Meetings	102
Tin Plate	81	New Facilities	103
Congress	84	Activities	104
Priorities	86	Army-Navy Awards	105

TECHNICAL

Planned Motor Drives Save Steel and Copper	108
<i>Features of the Adjustable-Speed Drive</i>	
Making 90-MM Guns Depends Upon Correct Tooling	110
<i>How Wheland Co. "Licked" Its Production Problems</i>	
Alloy-Sprayer Coats New Work	116
<i>Its Use Also in "Regalvanizing" Old Materials and Patching Weld-Burned Areas</i>	
Spot Welding Aluminum	118
<i>Details of Cleaning Methods; Metallurgical Factors</i>	
Materials Handling Principles Every Plant Manager Should Know	122
<i>How to Handle Materials Without Actually "Handling" Them</i>	
Electrolytic Tinning Lines Help Solve Tin Shortage	126
<i>Saves Two-Thirds of Tin Normally Required for Plating</i>	
Properties of Rubber as Used in Metal Drawing and Pressing Dies	130
<i>Its Use and Place in "Tooling"</i>	

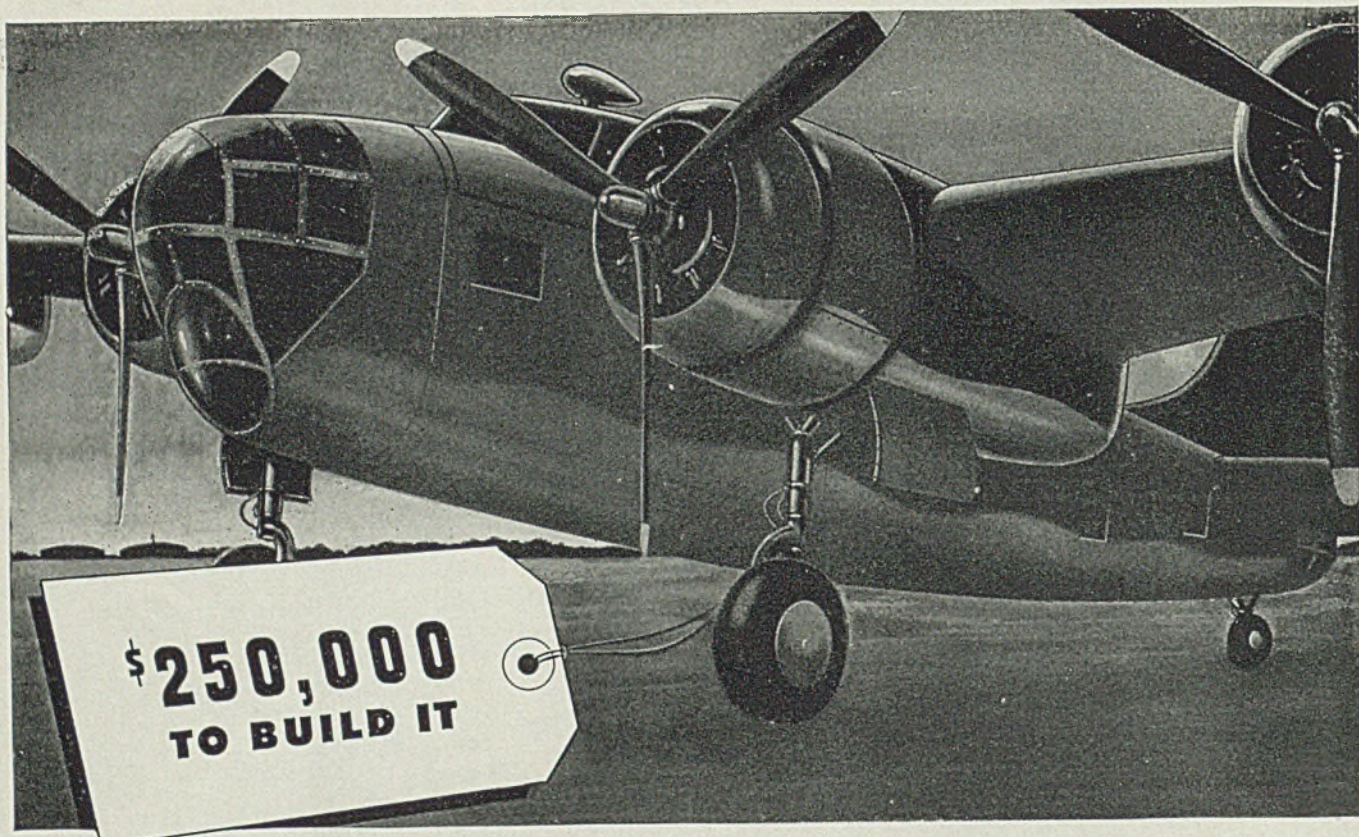
FEATURES

Behind the Scenes with Steel	4	Wing Tips	92
As the Editor Views the News	69	The Business Trend	106
Windows of Washington	82	Industrial Equipment	134
Mirrors of Motordom	89	Construction and Enterprise	168

MARKETS

Hope for More Civilian Steel This Year Fades	149
Market Prices and Composites	150

Index to Advertisers	177
<i>Where-to-Buy Products Index carried quarterly</i>	



but a \$1.10 order got it into the air



Billion-dollar orders for aircraft get the headlines, but more than once, a *dollar* order to Graybar for a missing part has been a key factor in getting a plane fully ready for flight.

One important builder, for example, rushed five emergency orders for production items to Graybar in a single day. Their amounts? \$1.10, \$15.00, \$5.00, \$1.10 and \$1.10. One covered an all-important set of special fuses. Others were for cable rings, clips, fittings and special lamps.

In one case, a special messenger made immediate delivery from stock. In others, telephone calls to St. Louis and Cleveland helped speed delivery. All were "money-

out-of-pocket" orders for Graybar, from the short-range point of view.

In building today's complex combat equipment, emergency needs like these are inevitable, no matter how carefully buying is planned. That's why prime contractors whose orders run to billions maintain a close tie with a local Graybar office, with daily or even hourly contact.

From its nationwide network of warehouses, from its well-informed relations with more than 200 leading suppliers, Graybar serves as Procurement Advisor on electrical needs, large and small. Why not check up now to see if your company is using Graybar's time-saving services to the full?

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GRAYBAR BUILDING
New York, N. Y.

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SABOTAGE FROM WITHIN: Last Wednesday Donald M. Nelson, chairman of WPB, warned that production of munitions in May was "unsatisfactory" and that of June, "although better than that in May," was short of its goal by half a billion dollars. He attributed this showing to shortage of industrial manpower, absenteeism, strikes and "a false and dangerously premature feeling that the war is in the bag."

Most informed persons will agree readily that these factors, in varying degrees, are affecting war production. We could be doing a better job than is being done if these obstacles were eliminated. But it will be difficult to eliminate them, or even to reduce their harmful influence, unless the public takes a more positive stand against the conditions responsible for these retarding factors. Apparently Mr. Nelson recognizes this fact, because he said that the government needs help in "making the civilian population understand the need of intensifying the war effort."

The government does need and should receive all the help that can be given it. However, the most urgent need of all is an administration in Washington of the nation's internal economy that will merit the respect of the people. If the American public does not understand the necessity of intensifying the war effort and if it is too complacent about hindrances to production, it is largely because so many high-placed individuals and so many agencies in Washington seem to be dilly-dallying with the war program.

Consider the Wallace-Jones feud, the Chester Davis and Lou Maxon resignations and the elevation of men like Vinson, Brown and Marvin Jones to positions which should be held by men with administrative instead of political experience. These are but outward evidence of the constant war being waged against the hard-working "know how" men in Washington by the visionary, inept and thoroughly meddling theorists who, through the offices of the "quiz-kid" invisible cabinet, seem to increase the security of their jobs in direct ratio to the number of blunders they make.

The real menace to the war program is not the

lack of proper spirit on the part of the American public. Instead, it is the demoralization within the government agencies dealing with civilian economy, which demoralization breeds public disrespect and apathy.

The greatest service citizens can render to Donald Nelson and the hundreds of other "know how" officials is to press hard for the elimination of the thousands of inept meddlers and to insist that the scores of non-war agencies help the war effort instead of sabotaging it.

Your senators and congressmen will be home until after Labor day. Tell them in detail just what you think of the disintegration of the administration of internal affairs.

. . .

NEED MORE EMPLOYERS: Writing in one of a series of pamphlets entitled "Postwar Readjustments" (p. 98), Dr. Emerson P. Schmidt propounds some thought-arresting questions regarding wages and employment relations. For instance, he raises the question as to whether labor has not "overpriced itself in terms of full employment."

Also he questions our national technique on unemployment. In the thirties, he says, we tried to correct unemployment by making the position of the employe more attractive and that of the employer less attractive. "Then we wonder why there are not more employment opportunities! We need more employers. The way to get them is to make their birth and survival rate higher."

Well put, we would say.

. . .

PIG IRON FROM TEXAS: Before Congress adjourned Senator Pat McCarran of Nevada wrote to 55 other senators inviting them to participate in a coalition or bloc to foster new and expanded iron and steel plants in states where such facilities do not exist or are not extensive.

Whether or not the senator's proposal can be taken seriously, it is a fact that the exigencies of war already have caused an appreciable "decentralization" of iron and steel facilities. Furnaces and mills

are being erected in localities far from established iron and steel centers.

Typical is Texas. Not only is the Lone Star state gaining in steelworks and rolling mill facilities, but the two blast furnaces now building (p. 103), when completed, will restore Texas to the roster of pig iron producing states after a lapse of many years.

WANTED—A CRAZY IDEA: In recent years the rich iron ores of the Lake Superior region have been consumed much more rapidly than ever before. Sooner or later it will be necessary to rely more heavily upon leaner ores. The sooner this is done, the better for all concerned.

All iron ore and iron and steel men know this. Several interested companies have been conducting extensive research to find economical means of utilizing the leaner ores. These investigations hold forth varying designs of promise for success, but the principal companies and individuals concerned want to be doubly sure that they find the right answers promptly. Therefore they are augmenting their individual efforts (p. 73) with a co-operative research program. Removing silica from iron oxide economically will be one of its principal objectives.

Also—believe it or not—these practical-minded men are openly seeking a “crazy idea”—possibly from a layman or somebody not too well versed in minerals—which may lead to the correct solution.

Some readers will smile at this frank appeal for help from unorthodox sources, but we believe the ore men are on the right track. Certainly history supports their method. Many of our most notable inventions and discoveries have resulted from somebody's faith in a “crazy idea.”

P.S.—For timely evidence as to how a “crazy idea” is making good in the war effort, note the practical manner in which a freak bridge (p. 100) is solving a unique problem of an upper Yorkstate builder of oil tankers for the U. S. Army.

ELECTROLYTIC TIN PLATE: Japan's capture of our principal sources of tin has hastened the development of electrolytic tin plating in the United States. Today 26 electrolytic tin plate lines are completed or under construction in the mills of 11 companies.

These new units are significant for two reasons. First, they will conserve precious tin (p. 81) during the war. In the hot-dip process a minimum coating

of 1.25 pound of tin is common practice. Electrolytic tin plate with a 0.5-pound coating, while not acceptable for all tin plate applications, is satisfactory for most fundamental requirements during the emergency. For uses where the 0.5-pound electrolytic plate can be substituted for the hot-dipped product (p. 126), a saving of 66 per cent in tin consumption is expected. This is conservation with a capital “C.”

The second significant point is that these electrolytic lines constitute a second major change in tin plate practice in a short time. Only a few years ago cold-rolled tin plate came into vogue almost overnight. Now a sudden upsurge in electrolytically coated plate is sweeping the industry. What will this mean when tin is more plentiful and when normal market conditions are resumed?

BAGGING SAVES MONEY: When a riveter in an airplane factory goes to the storeroom for an allotment of rivets, does it make any difference how the rivets are delivered to him or her?

Fleetwings' officials have discovered that it makes a lot of difference. They now issue rivets in small cellophane bags (p. 92) and find that the practice shows a saving in dollars of four to one on heat-treated rivets and of 10 to 1 on non-heat-treated rivets over unbagged rivets.

MORE STEEL IN SIGHT: WPB's “Steel for Victory” drive reports modest progress. Further cancellation of steel orders—mostly in the third quarter—brings to 150,000 tons (p. 76) the savings effected to date by the “Share the Steel” portion of the campaign.

Encouragement also is derived from an easing of the coal crisis. All but a few stacks are scheduled to resume operation, but only after an acute loss of production and a punishing cut in steel's laboriously accumulated stocks of scrap.

From now on the success of the effort to eke out 2,000,000 more tons of steel during the second half will depend largely upon the absence of man-made interruptions and bad luck. It is a touch-and-go proposition.



EDITOR-IN-CHIEF

Machine Output UP 37% TO 110% with INLAND LEDLOY

LEDLOY is the lead-bearing, faster-machining steel that produces more parts per hour, lowers labor and machine costs, and increases tool life up to 300%.

Inland Ledloy is open hearth steel containing a small percentage of lead added by a special Inland process. This addition of lead results in slight refinement of grain structure and greatly increased machinability. In all other physical properties—yield strength, ultimate strength, elongation, reduction of area, etc.—Inland Ledloy is the same as open hearth steel of similar analysis.

Today, Inland's entire production is being used by war industries to help win the fight for freedom, but when peace comes Ledloy will again be available for general manufacturing use.

**Write for further information
on Inland Ledloy**



"Foreign Agent"—LEDLOY LIMITED
66 Cannon Street, LONDON

Reports on five Inland Ledloy case studies recently made in British munition plants:

No. 1—Bottom Bracket Cycle Spindle

	Free Cutting Steel	Inland Ledloy
Spindle speed	500 r.p.m.	700 r.p.m.
Time per piece	59 sec.	28 sec.
Tool steel	18% tungsten	18% tungsten
Increased production	—	110%

No. 2—Grease Nipple

	Free Cutting Steel	Inland Ledloy
Spindle speed	2,495 r.p.m.	4,140 r.p.m.
Time per piece	20 sec.	13 sec.
Increased production	—	53%
Increased tool life	—	300%

No. 3—Set Screw

	Screw Stock	Inland Ledloy
Spindle speed	490 r.p.m.	693 r.p.m.
Time per piece	95 sec.	69 sec.
Increased production	—	37.6%

No. 4—5/16" x 2" Bolt

	Screw Stock	Inland Ledloy
Spindle speed, turning	896 r.p.m.	1,126 r.p.m.
Spindle speed, threading	296 r.p.m.	373 r.p.m.
Time per piece	21 sec.	13 sec.
Increased production	—	62%
Increased tool life	—	300%

No. 5—Locknut Blanks

	Free Cutting Steel	Inland Ledloy
Spindle speed	2,140 r.p.m.	2,140 r.p.m.
Time per piece	18 sec.	10 sec.
Increased production	—	44%
Increased tool life	—	50%
Spindle speed, tapping	950 r.p.m.	2,200 r.p.m.
Increased life of tapping tool	—	200%

INLAND STEEL CO.

38 S. Dearborn Street, Chicago

Sales Offices: Milwaukee • Detroit • St. Paul • St. Louis • Kansas City • Cincinnati • New York

“Share the Steel” Campaign Launched by W. P. B.

Will Try for Reduction of Inventories and Elimination of Duplicate Stocks

The cooperation of all manufacturers using steel is being sought by the WPB, to cut inventories and gain 2,000,000 tons of steel. Working through its 12 Regional Offices, Steel Division officials have been sent by the Washington Office to work with consumers, in an effort to see if steel supplies on hand will permit the elimination or deferment of third and fourth quarter orders on producers books without interfering with the production of important war equipment.

This effort to “share the steel”, if successful, will permit the diversion of tonnage to other manufacturers of war products who need it.

If each manufacturer will check his inventories against requirements carefully and avoid duplicate stocks, this government program may accomplish its purpose and make available the extra two million tons of steel needed during the last six months of the year.

Stocks of steel in the hands of commercial warehouses strategically located to serve *all* manufacturers help to overcome the necessity for large individual inventories and many duplicate stocks.

These steel service plants with long experience in stocking, cutting and shipping steel on a moment’s notice—are definitely the answer to the problem. Throughout the history of America, in peace and in war, they have served this very purpose. And now, in this greatest national emergency, they are carrying the burden—and stand ready to do even more to make it safe and practical to reduce high inventories, eliminate duplicate stocks, and lower the overall tonnage of idle steel.

JOSEPH T. RYERSON & SON INC.

STEEL-SERVICE PLANTS AT: CHICAGO, MILWAUKEE, ST. LOUIS, CINCINNATI,
DETROIT, CLEVELAND, BUFFALO, BOSTON, PHILADELPHIA, JERSEY CITY

WANTED:

An Idea

Operators of Lake Superior mines, in conjunction with Battelle Memorial Institute, launch research program to develop means for utilizing low-grade hematite as high-grade ore reserves shrink under tremendous consumption

THE LAKE SUPERIOR iron ore industry wants an idea.

It may be an idea such as sometimes springs spontaneously from the mind of a layman who knows little about the difficulties presented by the problem to be solved. In the past, some of the most baffling mechanical problems have been solved in just that way.

It may be worked out by some student of chemistry or physics working by himself in a make-shift laboratory.

Again, it may be evolved only after years of patient research by men who know about all there is to be known at present concerning characteristics of iron ore. Some of them have been engaged in research on the task many years, but so far—and it is a fact admitted by themselves—they have not produced the idea that is wanted. This is a practical, low-cost method for separating silica from iron oxide, in the great reserves of low-grade hematite in the Lake Superior district.

It is this that leads some of the mine operators to believe a solution may come some day through "a crazy idea" originating in the mind of an individual who has not been blinded by too close and too long a scrutiny of the formidable technicalities of the task.

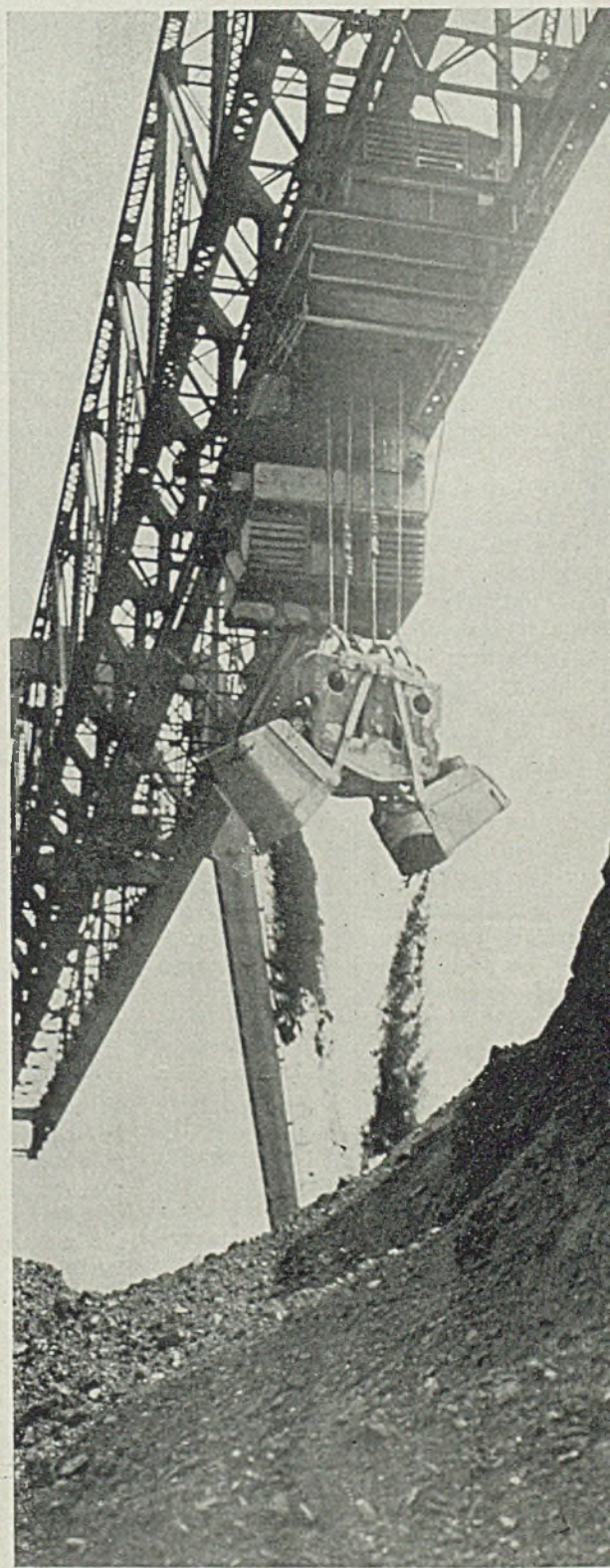
One experimenter highly regarded in the industry states frankly he is "no further ahead" on this particular problem than when he began work on it 20 years ago, which is an understatement considering the brilliant work he has done in related problems.

Recognizing its vital importance and determined to do something about it now, representatives of steel and ore companies met in Cleveland recently and decided on a research program, to be sponsored by them and the Battelle Memorial Institute, and to be undertaken by the institute at its laboratories in Columbus, O. An expenditure of \$50,000 annually is contemplated and this sum has been assured by the participating companies and the institute, for the first year.

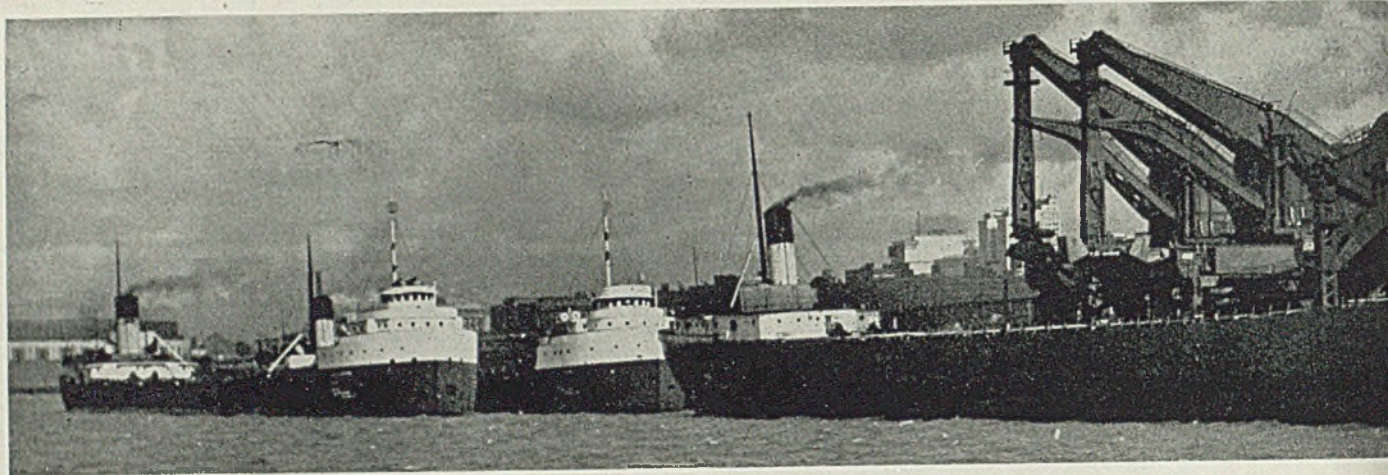
The group elected as chairman R. C. Allen, president, Lake Superior Iron Ore Association, and executive vice president, Oglebay, Norton & Co., Cleveland.

Stated broadly, the purpose is to develop means for utilizing the low-grade hematite ore in the Lake Superior district, without which the steel industry will begin to feel the pinch of diminished reserves within ten years. The "nubbin" of the job is to be able to separate quickly and cheaply, under ordinary commercial conditions, silica from iron oxide.

A large proportion of the ore is in the form of hard rock, containing a low percentage of iron. The rock may be pulverized as a preliminary to concentration—no difficulty about that. Other elements besides silica may be controlled by means now well known—no great obstacle in that. But the



Crane removing ore from vessel to lakefront docks at Cleveland. Ore is transferred at this point to cars and shipped to the hungry blast furnaces. . . . Stocks on hand at lake ports are under year ago



Late opening of navigation and adverse weather have served to retard movement of ore on Great Lakes in season to date. . . . Shipments 9,000,000 tons behind movement in like period of last year. . . . Scene above shows ore being unloaded from vessel at lower lake port

besetting impurity is silica—or sand—so intimately associated with the oxide that it defies separation.

Certain classes of ore lend themselves to crushing, screening and washing, to get rid of excess silica, but they are relatively high in iron to begin with. Hematite has even been converted to magnetite and the magnetite then separated from silica by magnets, and this has been done on a limited commercial scale for years. But the process is "round-about," and the industry as a whole is not concerned with a few hundred thousand tons of such concentrates, but over billions of tons of iron-bearing material that awaits the birth of an idea before it can be of service to mankind.

The reserves on which the industry mainly depends for the long-range future are composed of the low-grade hematites and magnetites. The problem of quarrying granite-like rock bearing magnetite, grinding it to a fine powder, separating the magnetic oxide from silica and sintering the oxide into a high-grade ore was solved mechanically nearly 20 years ago. A plant on the eastern tip of the Mesabi range, built by the Jackling interests and later taken over by a Cleveland ore company, will go into production again when required. Costs were too high and demand too restricted in the era the nation recently passed through to warrant its operation, but billions of tons of the material are there, and the means for recovering the iron are known.

Now with the steel industry built and geared to consume 100,000,000 tons of ore annually, producers are growing more concerned over future supplies and their costs. Even the United States Steel Corp. is participating in the \$50,000 research program.

This, it must be stated, is in addition to carrying forward experimental work now being done by some of the large producers and consumers on their own account and that by the bureau of mines,

as well as individual research by several large industrial companies related only indirectly to the steel industry. Totaled, the sum runs into hundreds of thousands of dollars annually.

The significance of this concerted action is this:

Authorities in the industry say that available reserves of high grade iron ore, usable as mined or readily converted to that purpose—will be gone in nine years at present rate of consumption.

The nation's industrial structure has been influenced by the location, quality and abundance of Lake Superior ores. Take away these supplies and great economic changes would result, affecting practically every manufacturing industry.

No one supposes that the present rate of consumption will be undiminished for the next ten consecutive years. Nevertheless, postwar plans, with the inevitable reconstruction and pentup civilian requirements, convince iron ore men that the industry has passed far beyond the prewar "normal" of 60,000,000 to 70,000,000 tons.

"All the postwar plans contemplate a high rate of employment, purchasing

power and civilian consumption," said an iron ore producer. "These conditions must be attained if we wish to keep faith with all those who are now fighting for the nation, and if we want to preserve our form of government. We, in the ore industry are planning in the same spirit.

"We view this matter of what to do about iron ore as one of the greatest problems concerning the future of industrial America.

"The problem to which I have referred will be solved in time. It is too important to be neglected.

"So, while we are spending large sums in scientific research, the field is wide open. Our people today are thinking as they never thought before. Some 'crazy idea'—based on sound but obscure principle—may prove to be of inestimable benefit to the country.

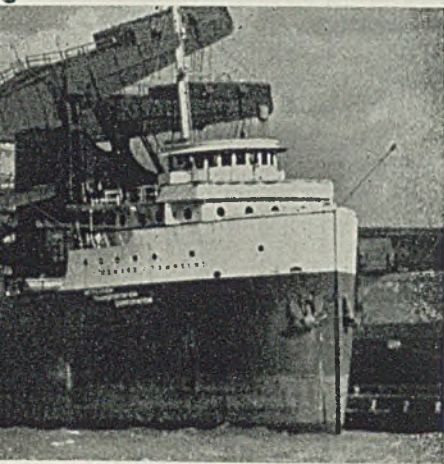
"The more I have studied the problem and considered what has been done the more I have become convinced that we need a brand, new idea—something of the order that has revolutionized industries in the past. It may appear to be a 'crazy idea,' but 'crazy ideas' sometimes click."

Lake Ore Shippers Strain To Make Up Early Season Tonnage Deficit

IRON ore shipments are currently running slightly ahead of a year ago on a weekly basis, but the movement of 29,785,921 gross tons for the season through July 12 is almost 9,000,000 tons behind the 38,716,988 shipped in the corresponding 1942 period. However, the present increase in weekly shipments ov-

er a year ago is expected to steadily widen through the balance of this season.

With a break in the weather there is a good chance shipments this month may closely approach the record of 13,405,408 tons shipped in July last year, and shippers are confident a new monthly



shipment peak will be established in August.

Vessel interests, however, are seriously concerned over the possibility of an ore shortage next spring. They are doing everything in their power to increase the current movement to make up for the tonnage lost due to the late opening of the shipping season, delay in shipping schedules, and vessel collisions.

Based on an estimated consumption during June of 7,000,000 gross tons, stocks at lower lake ports and furnaces were about 22,700,000 tons as of July 1. On same date last year stocks totaled 26,728,185. With stocks about 4,000,000 tons below a year ago, and iron ore shipments just recently surpassing that of last year on a weekly basis, together with monthly ore consumption averaging well above a year ago and expected to become even greater as new blast furnaces are brought into service, iron ore stocks during early spring months next year may be short.

Offsetting factors include the present coal strike situation which has forced a number of blast furnaces down and the growing number of stacks being shut down for repairs.

New blast furnaces, depending principally on Lake Superior iron ore, scheduled to be brought into service through the remainder of this year are: Two at Braddock, Pa., for Carnegie-Illinois Steel Corp.; two at Chicago for Inland Steel Co.; one at Chicago and one at Cleveland for Republic Steel Corp.; and one at Monessen, Pa., for Pittsburgh Steel Co. There are additional new furnaces also scheduled to be blown in before the close of this year that are not dependent on Lake Superior ores.

Shippers are hopeful that the goal of 91,000,000 tons set for this year will be reached. If fog conditions do not further delay shipping schedules over the remainder of the summer months, and storms and ore freezing weather are not encountered during the latter part

of the shipping season, there is a fair chance that the goal will be attained.

Swollen lake waters—at highest levels in past 20 years—have permitted capacity loadings of most vessels. This has resulted in a series of cargo records recently established by the Pittsburgh Steamship Co.'s new vessels. The record is now held by the IRVING S. OLDS, with a cargo of 18,161 tons.

Another factor which ore shippers are depending on to make up the present deficit of 9,000,000 tons is the bringing into service of the 16 new Maritime Commission vessels. Five of the vessels are now in the ore trade; four are scheduled for July and the remainder through the balance of the season.

Opening of the Gen. Douglas MacArthur deep-water lock at Sault Ste. Marie on July 11 is expected to materially alleviate congestion of vessel traffic through the Soo canal during periods of adverse weather. When the lakes are not swollen to the present record levels, this new lock will permit passage of the 16 Maritime and five new Pittsburgh Steamship Co.'s vessels with capacity cargoes. The other three locks at the Soo could not handle these same vessels loaded to capacity under similar conditions.

Improved operating equipment in the new MacArthur lock also lessens the time interval in transit through the Soo. The new lock, 800 feet long and 30 feet deep, was built in record time of 13 months at a cost of \$14,000,000. It compares with the Davis and Sabin locks which are 1350 feet long and 24½ feet

deep; and the Poe lock, 800 feet long and 18 feet deep.

The self-unloader freighter CARL D. BRADLEY, of the Bradley Transportation Co., was the first large vessel through the new lock. First downbound ship to pass through the lock was the 640-foot VOORHEES of the Pittsburgh Steamship Co.

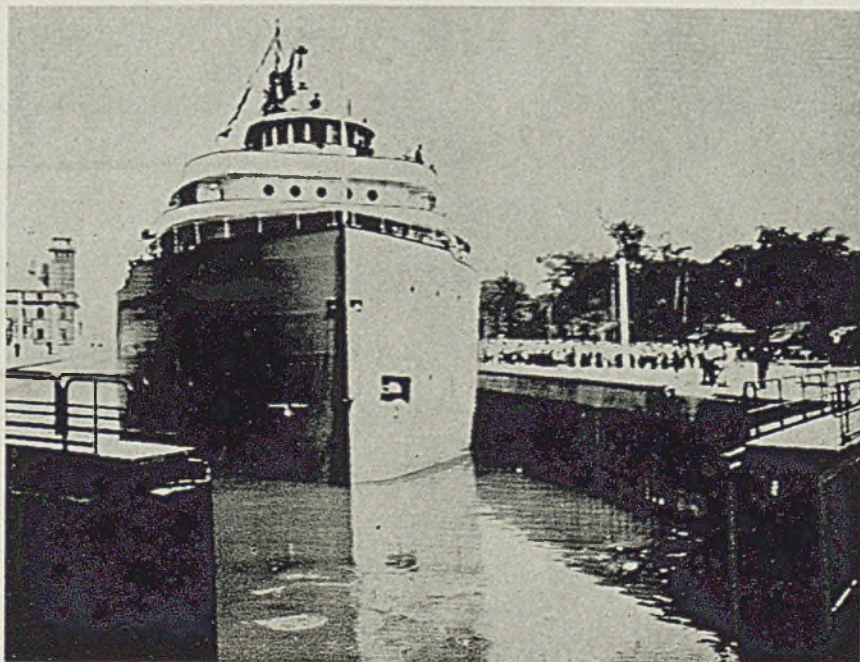
There are six Canadian boats in the ore trade, with more scheduled over the balance of the season. A month ago there were none in the trade, while last year at this time there were 35 Canadian vessels carrying ore.

Of the 313 vessels in the American Great Lakes fleet on July 15, 308 are in the ore trade, against 292 a month ago and 300 last year.

No recent change in the scheduled movement of grain and coal in relation to iron ore has been made, although it is reported considerable pressure is being brought to bear for an increase in the scheduled grain movement of 135 million bushels.

Lake coal movements from any United States port to the Buffalo and Chicago areas are scheduled at 80 per cent of the aggregate quantity moved to those areas last year; to Lake Superior ports, 110 per cent; and to all other areas 100 per cent of the quantity moved in 1942. Lake carriers are expected to ship 50 million tons of coal this season, against some 49 million last year. For the season to July 12, 16,325,291 tons of coal had been loaded into vessels at Lake Erie ports, compared with 20,768,669 same date a year ago.

Lake freighter CARL D. BRADLEY making the first ship passage through the new \$14,000,000 MacArthur lock at the Soo which was opened July 11 with appropriate ceremonies



Campaign Progresses Despite Adverse Effects of Coal Strike

War Production Board advised over 150,000 tons on mill books for third quarter cancelled in "Share the Steel" program. . . Production outlook brightens as blast furnaces resume with coal strike virtually ended

FURTHER progress was reported last week in the "Share the Steel" campaign launched July 1 by the War Production Board's Iron and Steel Division, as part of its "Steel for Victory" drive in which it hopes to obtain 2,000,000 additional tons of steel for war production in the last half of the year.

Word received by WPB is that to date 150,000 tons of steel allotments have been canceled for third quarter due to the "Share the Steel" program, of which 140,000 tons are carbon and 10,000 tons alloy steel. A small quantity of steel also was canceled for fourth quarter.

In the Philadelphia district alone, freeing of about 50,000 tons is reported. Total covers both cancellation of existing orders on mill books and allotments authorized but not yet placed; also tonnage that was deferred until next year. In the Philadelphia area it is hoped at least 75,000 tons will be made available before the campaign ends.

Tonnage being released is said to be fairly well diversified, and it is in addition to large "as is" stocks in which the Steel Recovery Corp. is primarily interested. The total is comprised chiefly of plates, shapes and light gage sheets and strip material that had been fabricated to meet requirements, and which subsequently

were changed to meet war needs.

The "Steel for Victory" drive is a three-pronged effort in which the government seeks 2,000,000 additional tons through more efficient operation of existing facilities, redistribution of allocated tonnage, and bringing in of additional capacity.

Mine Stoppage Ends

The coal strike has continued to hamper the drive, interfering with steel production especially in the Pittsburgh district. At the close of last week the mine stoppage appeared about ended with most of the 4000 miners still idle in western Pennsylvania having voted to return to work. This change of heart on the part of the laggard strikers came coincident with a federal grand jury inquiry into the matter which began July 14 presumably under the recently enacted Smith-Connally Anti-strike law.

So serious was the shortage of coal last week, Fuel Administrator Ickes, acting to "relieve the growing paralysis of the steel industry" ordered 135,000 tons of fuel diverted to steel plants, directing diversion of special-purpose metallurgical coal at the rate of 22,500 tons daily.

Blast furnace operations were hard hit at Pittsburgh, 12 stacks being banked

early in the week. By midweek, however, three had resumed blowing and the Clairton coke works was scheduled to resume 100 per cent, as it was obvious that the situation had taken a turn for the better with the strikers in the captive mines returning to work. Hopes were high that by the end of the week operations would be resumed in all mines and that at least three more banked blast furnaces would be restored to production. The Clairton coke works had been running at 50 per cent capacity but started upping schedules July 15.

In the Youngstown district the coal strike also hampered pig iron production. Last week Carnegie-Illinois Corp.'s Ohio works was forced to slow down furnace activity in order to conserve coke. This slow-down came after operations had fully recovered from the slow-down of the preceding week.

Estimates are not available as to the amount of pig iron production lost as a result of the coal strike, but the average is believed to be about 15,000 tons a day since the beginning of the coal strike, both from stacks that were actually banked and others which were running slow to conserve coke.

Despite the banking of numerous blast furnaces, steelworks operations have been only slightly affected. In the Pittsburgh district, open hearths, however, have been more greatly dependent on scrap as a result of the curtailment in pig iron supply.

Pressing the WPB's "Steel for Victory" drive on a visit to the plant of the Lukens Steel Co., Coatesville, Pa., last week, C. E. Wilson, executive vice chairman, WPB, told employes of the steel company a shipbuilding program of 20,-



Charles E. Wilson, executive vice chairman, WPB (center), arrives at DuPont airport to visit plants of Lukens Steel Co. and its subsidiaries, Coatesville, Pa., on "Steel for Victory Drive." Robert W. Wolcott (left), Lukens president, and G. Donald Spackman, vice president in charge of operations, met Mr. Wilson and other members of the latter's party

000,000 tons this year—a 150 per cent increase over 1942—is forcing a demand for more steel shapes that must be met with increased steel production. In welcoming Mr. Wilson and members of the WPB party, Robert W. Wol-

cott, Luken's president, said neither the company nor workers were satisfied with the zooming record of production established so far at Coatesville, and he pledged that his company would contribute its share of the increase in steel production that America must have in the last half of 1943.

Present, Past and Pending

■ SINCLAIR TO BUILD NEW PIPE LINE

NEW YORK—Sinclair Oil Corp. has started construction of a new pipe line from Chicago to Toledo, O. The project will be completed about October. Tankers and barges will carry the petroleum products to eastern points from the terminus of the 220-mile line which will run from the Chicago refining center to the western end of Lake Erie.

■ NO FEAR OF MILITARY PLANES ON POSTWAR MARKET

NEW YORK—Harry Woodhead, president, Consolidated Vultee Aircraft Corp., declared recently aircraft manufacturers have little to fear from resale of military equipment in the immediate postwar period. He stated that with the exception of little primary trainers, military aircraft are too expensive to operate and too difficult to pilot to make them a real threat to the postwar airplane market.

■ HALT CONSTRUCTION OF BRIDGE AND AIRPORTS

WASHINGTON—War Production Board halted construction of three CAA airports at Aurora, Ill., Purcell, Okla., and Beaver March, Oreg., in an effort to conserve materials and equipment. Construction was also halted on the \$1,100,000 bridge spanning the south branch of the Chicago river at South Canal street, Chicago.

■ ARMY MAY STANDARDIZE AIRCRAFT SOON

LOS ANGELES—American army aircraft in the near future will be standardized, four fighter models and perhaps six or eight bombers ranging from heavier than Flying Fortresses to light bomber-fighter planes, Gen. Henry H. Arnold, chief, Army Air Forces, said as he toured aircraft plants here.

■ G-E FIRST HALF ORDERS TOTAL \$941,529,000

SCHENECTADY, N. Y.—Orders received by General Electric Co. in the first six months this year amounted to \$941,529,000 compared with \$865,372,000 in the like period of 1942. Second quarter orders totaled \$519,482,000, a decrease of 8 per cent from the \$566,252,000 in the same quarter last year.

■ PREDICTS TIGHTNESS OF GRAIN FREIGHT CARS

CHICAGO—Increased tightness in supply of freight cars available for grain shipments for western railroads during the next 90 days was predicted by Ralph Clark, manager, closed car section, Association of American Railroads before a meeting of the mid-west shippers' advisory board.

■ WPB MAY MOVE ALUMINUM PLANT FROM COAST

WASHINGTON—War Production Board is considering transfer of part of an aluminum reduction plant in Los Angeles to New York city because of a manpower shortage on the West Coast. No final decision has been made yet.

■ SCRAP YARD LABOR SUPPLY TIGHT

WASHINGTON—Reports reaching WPB scrap officials are to the effect yards throughout the country are having a great deal of labor trouble. Prediction is made that if the labor situation in the scrap industry is not taken care of shortly, it will lead to considerable difficulty in the near future. No complaints are being received of scrap shortage in the steel industry.

■ PRODUCE 9000 NAVY PLANES IN FIRST HALF

WASHINGTON—More than 9000 planes were produced for the Navy during the first half of 1943, Secretary of Navy Frank Knox announces. The total equals the number built for the Navy during all of 1942 and is two and one-half times the 1941 total.

H. G. Batcheller, vice chairman in charge of operations of WPB, said that of all the shortages, "the most critical one is in steel plates and shapes and unless we have more plates and fabricated parts, we will falter in achieving our 20,000,000-ton shipbuilding goal."

WPB Iron and Steel Division officials are scouring the country to try and ascertain just what steel inventories are in the hands of consumers. This applies particularly to any over-supply of any particular kind of steel.

While WPB officials will not discuss the matter in detail, some express the opinion they might be able to find as much as 200,000 tons in both the third and fourth quarters to help make up the 2,000,000 tons needed. WPB will not count as inventory any lend-lease material stored any place in the United States for shipment abroad in the future.

Steel production in the first half of 1943 established a new all-time record, totaling 43,866,912 net tons of ingots.

In the first six months of the year, the industry has operated at 97.9 of rated capacity, but in June the average was only 94.6.

Various steel producing and consuming areas will be visited by top War Production Board executives in the drive to get in the additional 2,000,000 tons over the remainder of the year. Meetings similar to those held in Pittsburgh July 1, and that at Coatesville, Pa., July 13, will be held in Chicago, Cleveland, Youngstown and Philadelphia in the near future, although no dates have yet been set.

Great Lakes To Install Hot Metal Mixer Unit

Great Lakes Steel Corp., Detroit, is installing a 1400-ton hot metal mixer at its open-hearth plant to ease pressure on transport facilities from blast furnaces on Zug Island to the plant at Ecorse. Metal is now moved in mixer-cars and the new holding unit will assure adequate supply at open hearths should there be interruption to movement of cars.

Plans are under consideration for installation of bessemer converters to process hot metal before charging to open hearths but the project is still in the "if, as and when" stage.



DONALD NELSON

SHORTAGE of industrial manpower, absenteeism, strikes, and a false and dangerously premature feeling that the war "is in the bag," last week were attributed by Donald M. Nelson, chairman, War Production Board, for an unsatisfactory war production showing recently.

In a radio broadcast launching the War Advertising Council's drive for "a war message in every ad," Mr. Nelson urged American business to throw its weight through advertising into the effort to shake off a production slump. He disclosed that June war production missed its \$6,500,000,000 goal by one-half billion dollars.

"In order to meet the urgent demands of the armed services, huge production goals were set for 1943," Mr. Nelson said. "We are not currently meeting those goals from month to month. We are gaining in total output but that output is not rising fast enough to meet the steady rise in our production goals.

"Production in May was unsatisfactory. Production in June, although better than in May, still did not show much improvement.

"I want to state bluntly, here and now, that if we are to meet our overall schedules for 1943, the American industrial front faces a staggering job in the months ahead."

Mr. Nelson said the nation is doing a good job, pointing out, for instance, that there was a 40 per cent increase in aircraft production in the first half of the year and a 25 per cent increase in munitions output. However, he declared the showing is "not good enough" to meet the military needs of the United Nations.

The WPB chairman said that while the government is dealing with the various problems contributing to the forces retarding production progress, it needs help in making the civilian population understand the need of intensifying the war effort, and he declared "a war message in every ad" can do much to bring

"War Is Not in the Bag!"—Nelson

War Production Board chairman attributes recent unsatisfactory showing of munitions production to manpower shortage, absenteeism, strikes, and growing complacency

about another great upward surge of energy in this country—a surge that will enable us to turn out more of the stuff that our fighting men need to batter the Axis into surrender."

Joining in the radio symposium to the advertising men were Director Elmer Davis of the Office of War Information and Food Administrator Marvin Jones. Mr. Davis declared the task of mobilizing the home front to hasten victory "needs the technique that is the voice

expected to run beyond \$65,000,000,000. Aircraft and related equipment gained 5 per cent in May over April. Production of Army and Navy vessels and Army ordnance equipment gained 2 per cent. Completion of naval vessels scored an increase of 30 per cent over April and 9 per cent over the best previous month. Ground ordnance declined 3 per cent. Merchant vessels declined 3 per cent, munitions output dropped 7 per cent, while military automotive vehicle production rose 3 per cent.

The merchant ship program for the year is understood to be the most advanced with 44 per cent of the ship objective completed by June 30. Army ordnance and output of naval vessels are estimated at 40 per cent. The aircraft program is 35 per cent complete.

WLB Extends Membership Clauses in Two Contracts

Acting upon requests of two subsidiary companies of the United States Steel Corp., Oil Well Supply Co., Oil City, Pa., and the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., the National War Labor Board last week announced it unanimously approved the extension of maintenance of membership clauses in the companies' contracts with the United Steelworkers of America, CIO, to cover two plants where the union has won bargaining rights.

Labor Board Asserts Right To Suspend Union Shop

The Cleveland regional War Labor Board made two far-reaching decisions last week. In one, involving a dispute between the A. F. of L. and C. I. O. United Automobile Workers unions at the Trailer Co. of America, Cincinnati, the regional WLB declared its authority to suspend temporarily a union shop clause in a contract when, in its opinion, the war effort requires it.

In the other, involving the National Carbon Co., Edgewater plant, in Cleveland and the United Electrical, Radio and Machine Workers of America, it announced a policy of ordering compulsory, instead of voluntary, check-off in all cases in which it orders maintenance of membership and the union requests the check-off.

SICILY'S RESOURCES

Invasion of Sicily by the combined forces of the United States, Canada and England marks another momentous step in opening a second front on the European continent. But the island is of little industrial significance to the United Nations because its population is largely devoted to agriculture and fishing.

The Axis, however, through loss of Sicily will be cut off from another source of vitally needed mineral, for a great amount of sulphur is mined on the island.

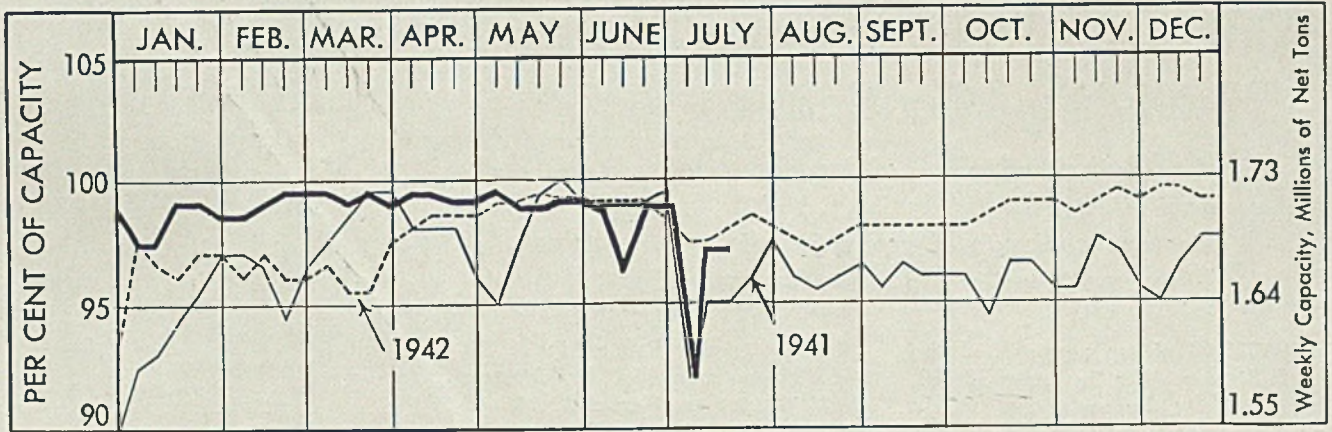
Sulphur is the most important Sicilian mineral, it being mined principally in Caltanissetta and Girgenti and in minor quantities in Palermo and Catania. Another Sicilian industry is the mining of common salt and rock salt.

Sicily consumes iron and steel in her agricultural industries. Wine, olives, olive oil, lemons and oranges are exported.

of American business—advertising." Mr. Jones said Americans must be taught that the waste of food in wartime is "a national sin," and he asked the assistance of business in teaching conservation.

Shifts in the military program held May munitions production to the April level. Last week the War Production Board reported its munitions index for May was 563 (based on November 1941 as 100), the same as the revised April figure.

Munitions now are being produced at a rate of \$60,000,000,000 a year, and the total for the twelve month period is



STEEL INGOT PRODUCTION BY MONTHS

	Net Tons, 000 omitted											
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1943	7,424	6,826	7,670	7,374	7,545	7,027	.....	.....	.....	.....	.....	.....
1942	7,112	6,512	7,392	7,122	7,382	7,022	7,148	7,233	7,067	7,584	7,184	7,303
1941	6,922	6,230	7,124	6,754	7,044	6,792	6,812	6,997	6,811	7,236	6,960	7,150

	PIG IRON PRODUCTION											
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1943	5,194	4,766	5,314	5,035	5,178	.....	.....	.....	.....	.....	.....	.....
1942	4,983	4,500	5,055	4,896	5,073	4,935	5,051	5,009	4,937	5,236	5,083	5,201
1941	4,666	4,206	4,702	4,340	4,596	4,551	4,766	4,784	4,721	4,860	4,707	5,014

Ingot Rate 97%

Coal strike effect being overcome. Blast furnaces off for relining

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week was unchanged at 97 per cent of capacity. Seven districts made small gains, two declined and three were unchanged. A year ago the rate was 98 per cent; two years ago it was 95 per cent, both based on capacities as of those dates.

Greatest loss in production was in the Pittsburgh district, which fell 4 points to 93 per cent, as a result of the coal strike. Gains at other points substantially balanced this decline.

Carnegie-Illinois Steel Corp. has blown out its No. 4 stack at Mingo Junction, O., for relining, leaving two furnaces active in that area.

Carnegie-Illinois Steel Corp. blew out its Gary No. 3 blast furnace July 14 for relining. This is the only one of the 39 stacks in the Chicago district not operating.

Canadian Steel Production Shows Slight Gain in May

While steel and iron production in Canada in May showed a small gain over the April rate, for the five months ending May 31 steel output is off 3.6 per cent and pig iron 12 per cent from the high record made during the comparable months in 1942.

Steel ingot and castings production in

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended July 17	Change	Same Week 1942	1941
Pittsburgh	93	- 4	94	99.5
Chicago	99.5	+ 1.5	102	100
Eastern Pa.	93	None	96	97
Youngstown	97	+ 3	96	98
Wheeling	90	+ 3	83.5	91
Cleveland	94	+ 1.5	94.5	95
Buffalo	93	+ 3	93	93
Birmingham	95	None	95	90
New England	95	None	90	95
Cincinnati	92	+ 3	88.5	85.5
St. Louis	97	+ 2	95.5	98
Detroit	90	- 2	85	86
Average	97	None	*98.0	*95.0

*Computed on bases of steelmaking capacity as of these dates.

May was 271,737 net tons, of which 259,289 tons were ingots. Pig iron output totaled 154,746 tons, of which 124,315 tons were basic, 15,505 tons foundry and 14,926 tons malleable.

During May production capacity for steel castings was increased by 2950 net tons, Steel Co. of Canada Ltd. putting into production recently a new electric furnace at its Hamilton, Ont., works. It is the largest electric furnace in Canada. This accession increases annual rated capacity for steel castings to 281,600 tons and total steel furnace capacity to 3,453,600 tons per year.

Comparative production figures for May and prior months are as follows:

	Steel Ingots		Ferro-alloys
	Castings	Pig Iron	
May, 1943	271,737	154,746	17,971
April, 1943	264,357	150,486	18,698
May, 1942	272,247	171,386	19,428
5 Mos. 1943	1,259,652	719,900	93,642
5 Mos. 1942	1,305,075	806,039	93,179
5 Mos. 1940	1,076,624	574,827	81,963

Steel Shipments

Lowest since February for U. S. Steel Corp. Total was 1,552,663 net tons in June

EFFECT on the steel industry of coal mining interruptions are reflected in shipments of finished steel by United States Steel Corp. subsidiaries in June. These totaled 1,552,663 net tons, lowest for any month since February, 1941, when they were 1,548,451 tons. There were only 24 working days in February, 1941, compared with 26 last month.

June shipments were 153,880 tons less than the 1,706,543 tons of May and compared with 1,774,068 in June, 1942, a decrease of 221,405 tons. June, 1941, shipments which totaled 1,668,637 net tons exceeded last month's total also.

On the basis of daily average shipments June showed 59,718 tons, a decline of 5918 tons from 65,636 tons in May and 8515 tons from the 68,233 tons average in June, 1942.

(Inter-company shipments not included)

	Net Tons			
	1942	1942	1941	1940
Jan.	1,685,992	1,738,893	1,682,454	1,145,592
Feb.	1,691,592	1,616,587	1,548,451	1,009,256
Mar.	1,772,397	1,780,938	1,720,366	931,905
Apr.	1,630,828	1,758,894	1,687,674	907,904
May	1,706,543	1,834,127	1,745,295	1,084,057
June	1,552,663	1,774,068	1,668,637	1,209,684
July	.....	1,765,749	1,666,667	1,296,887
Aug.	.....	1,788,650	1,753,665	1,455,604
Sept.	.....	1,703,570	1,664,227	1,392,838
Oct.	.....	1,787,501	1,651,279	1,572,408
Nov.	.....	1,665,545	1,624,186	1,425,352
Dec.	.....	1,849,635	1,846,036	1,544,623
Total	.....	21,064,157	20,458,937	14,976,110
Adjustment	.....	.....	*42,333	†37,639
Total	.....	.....	20,416,604	15,013,749

†Increase. *Decrease.

Shifting of Top Personnel of WPB Division Continues

N. W. Foy advanced to post of deputy director. . . J. L. Block, assistant director for distribution. . . C. H. Longfield, assistant director and chairman of production directive committee. . . J. V. Honeycutt, assistant director for production

SHIFTING of top personnel of the Steel Division, War Production Board, continues. At the same time a new subdivision to deal with manpower problems has been set up in the division, it was announced last week.

The most recent personnel changes involve the following men, identified by their positions before coming to Washington in 1941: Norman W. Foy, general manager of sales, Republic Steel Corp., Cleveland; Joseph L. Block, executive vice president, Inland Steel Co., Chicago; Jesse V. Honeycutt, assistant vice president in charge of sales, Bethlehem Steel Co., Bethlehem, Pa.; and Charles H. Longfield, general manager of sales, Youngstown Sheet & Tube Co., Youngstown, O.

Mr. Foy has been appointed deputy director of the Steel Division and his former position as assistant director for distribution will be filled by Mr. Block, who has been chairman of the division's Production Directive committee since its inception.

Mr. Longfield has been named assistant director and chairman of the Production Directive committee and previously was chief of the Tubular Products and Tin Plate Branch.

Mr. Honeycutt, who has been chief of the Wire and Heavy Products Branch, has been appointed assistant director for production, succeeding David F. Austin who resigned recently to return to his post with Carnegie-Illinois Steel Corp.

A new position, assistant director of the Division for Manpower, will be filled by Harold J. Ruttenberg, Pittsburgh, formerly special assistant to the director of the Steel Division. Before joining the division in November, 1942, Mr. Ruttenberg was research director for the United Steel Workers of America (CIO).

At the end of June, Hiland G. Batcheller, who had been director of the Steel Division since September, 1942, was elevated to operations vice chairman of WPB. Reporting to him now are all of the industry, conservation, salvage and redistribution divisions together with the deputy vice chairman for field operations. Mr. Batcheller is president of Allegheny Ludlum Steel Corp., Brackenridge, Pa.

Vacancy in the directorship of the Steel Division was filled by elevating John T. Whiting, president of Alan Wood Steel Co., Conshohocken, Pa., from his former post as deputy director.

Vital role of the Steel Division in the war production program has intensified considerably under operation of the Controlled Materials Plan. It is charged with supervision of steel production and the distribution of steel products. It must prepare and submit to the CMP Requirements committee statements of requirements of each claimant agency and of total anticipated supply of steel as well as recommendations as to the appropriate reconciliation between aggregate requirements and anticipated supply.

In addition, the division is responsible for obtaining requisite production of steel in the forms required; for balancing such production and its distribution within the scope of its jurisdiction; for checking allotments insofar as this is possible in connection with steel orders placed with producers; and for recommending appropriate action to make the most efficient use of steel through changing specifications, substitution, simplifying production and adoption of other conservation practices. The division is authorized to issue production directives to steel producers, directing them to produce specified tonnages per month of certain shapes, forms and sizes.

Metals Reserve Co. Buying Surplus Steel Valve Stocks

Redistribution Division, War Production Board, is calling upon all users of new high-pressure steel valves to list their surplus items on form WPB-2844. They also are asked to indicate whether they are willing to sell such valves to the government. If those sold must be replaced later, the holders are asked to indicate the desired replacement date so that arrangements for replacement can be made now with the manufacturers.

Surplus valves are to be purchased by the Metals Reserve Co. through its agency, Murray Cook, at market prices and resold to valve manufacturers to help them meet orders now on their books.



NORMAN W. FOY



JOSEPH L. BLOCK



C. H. LONGFIELD



J. V. HONEYCUTT

Seeks To Stretch Tin Supplies

WPB Tin-Lead Division director points to need for conservation. Steel as much as tin held key to tin plate situation. States new electrolytic plate used as fast as it became available

WHILE, fortunately, we have fair stocks of tin in this country, it is the considered opinion of the War Production Board that the nation's supply of tin should be stretched as far as possible without dislocating any military or essential civilian requirements, states E. Vogelsang, director, Tin-Lead Division, War Production Board, in a letter to the editor of *STEEL* in which he takes exception to certain statements made in an article on tin and tin plate appearing in *STEEL*, issue of July 5.

Mr. Vogelsang's letter in full follows:
To the Editor of *STEEL*:

"In *STEEL* July 5th, there appears an article entitled 'Producers Believe Restrictions on Tin Can Be Lifted.'

"There are too many errors in this article to permit them to go unchallenged.

"It is granted that, fortunately, we have a fair sized stock of tin in the country; however, as long as our enemies occupy the Far Eastern producing areas, the supplies available to us will be substantially under the minimum requirements and the stock will be depleted for the duration of hostilities, and in addition until such time as we can rebuild tin producing facilities in the Far Eastern areas after they are recaptured. For this reason, it is the considered opinion of the War Production Board that our supply of tin should be stretched as far as possible without dislocating any military or essential civilian requirements.

Conserve Available Supply

"This principle of conserving available supplies of a critical material is being pursued by the Tin-Lead and Conservation Divisions of the War Production Board in the case of tin for tin plate just as in the case of our other critical materials. It is our aim to insure maximum production and distribution of all commodities essential to the war program, including articles of food. With the over-all material shortage facing us it is necessary to use the least critical container material in all instances just as we have the co-operation of the Army and Navy in using the least critical suitable materials for planes, tanks, ships and guns. Bulk shipments of dehydrated or frozen foods ordinarily require less packaging material. Where small unit containers are essential, these

should preferably be made from one of the following materials selected as early in the list as possible: (1) paper, (2) glass, (3) black plate, with or without bonderized and lacquered coating, (4) electrolytic tin plate, (5) hot dipped tin coating and using the lowest practical thickness of tin. Maximum accomplishment of conservation in packaging necessitates restriction in the usage of each of these types of containers where less critical container material for bulk shipments would suffice. With current reductions in the rate of steel output serious inter-

GOVERNMENT'S VIEW

Discussion of the tin and tin plate situation in *STEEL*, page 62, July 5th issue, to which exception is taken in the accompanying letter to the editor from E. Vogelsang, director, Tin-Lead Division, War Production Board, reflected the viewpoint of industry as obtained by *STEEL*'s representative through interviews with responsible production executives. *STEEL* is pleased to present the government's views on the subject given in Mr. Vogelsang's letter.

ference is being encountered with essential military programs and no steel product should be specified where packaging of a non-essential commodity is involved or where a less critical material would suffice for packaging an essential commodity.

"The article states 'it is difficult to understand why the electrolytic tin plate program was made so large.'

"This program is an entirely voluntary one initiated by the tin plate industry immediately after Pearl Harbor. Naturally government officials were pleased with the foresight of the tin plate industry in undertaking this major conservation measure but no suggestion or recommendation as to the size of the program was offered to our knowledge by any government official.

"At no time since our entry into the war when restrictions and control measures were put into effect has tin plate

production suffered because of the restricted use of tin. Steel has been allocated to the tin plate industry on the basis of requirements for essential packing and tin has been allocated to coat this steel, using the lightest possible coating. Supplies of steel just as much as tin are the key to the situation.

"It was stated in the article that the electrolytic tin plate program will be permitted to operate at only partial capacity. To date, we have used electrolytic tin plate almost as fast as it has become available and more would have been used if it had been available in time for such packs as peas and corn. In making this statement we do not wish to reflect upon the ability of the producers, since they, like everyone else, have had difficulty obtaining critical components for their equipment.

"It was further stated that the chief stumbling block in the electrolytic tin plate program is the fact that the Army and Lend-Lease require hot dipped plate for their overseas shipments, and for this reason such heavy tonnage items, as army field ration cans, oil cans, etc., are manufactured from hot dipped tin plate. This is definitely not the case. With the exception of meat, which is now under consideration, the Army and Lend-Lease have agreed to accept for export electrolytic tin plate cans for all products which are packed in electrolytic cans for domestic consumption. Oil cans have not been manufactured from tin plate in many years, and at the present time the Army is not buying any of these containers except those which are manufactured from frozen stocks ofterne plate.

"Obviously any new development such as electrolytic tin plating has many 'bugs' to contend with, but tin plate manufacturers, can manufacturers and canners are to be commended for their efforts in gradually overcoming many of the difficulties. By the end of 1943 or early 1944, an increasing number of products will be packed in electrolytic plate so that the new lines should operate at fair capacity.

E. Vogelsang,
Director, Tin-Lead Division
War Production Board"

Maxon Resigns OPA Post

Charging that the Office of Price Administration is hampered in its work by its own internal weakness, Lou R. Maxon has resigned as deputy administrator in charge of information. Mr. Maxon came to Washington early this year from his Detroit advertising firm, Maxon Inc.

WINDOWS of WASHINGTON

No Sounding Board

THE QUARREL between Vice President Henry Wallace, in his capacity as head of the Board of Economic Warfare, and Jesse Jones, as head of Reconstruction Finance Corp. and its subsidiaries, apparently will not have a sounding board in Congress if Democratic members have their way.

Senator Bridges' resolution asking a Senate investigation was referred not to the Senate Military Affairs Committee but instead to the Senate Banking Committee. The Military Affairs Committee is headed by Senator Reynolds, who frequently criticizes the administration, whereas the chairman of the Banking Committee is Senator Wagner of New York, a leading new dealer. Hence it remains to be seen whether Mr. Jones is guilty, as charged, of delaying purchases of strategic materials.

At the same time, the natural feeling among the Democrats as a whole being they want to avoid a blow to the party in general, the struggle between regular Democrats and New Dealers continually brings new moves. One of the latest is a proposal by Representative Summers of Texas that the constitution be amended to permit Congress to override a veto with a simple majority.

Improving

Signs are beginning to develop that the railroad transportation situation in Mexico will improve shortly. Since Mexican railroad labor sometime back decided to select their supervisors and foremen by electing them, things had been going from bad to worse. On June 16, the Association of American Railroads, with the approval of the Office of Defense Transportation embargoed shipments across the border at Laredo, Eagle Pass and Brownsville, Tex., because of congestion resulting from the inability of the National Railways of Mexico to accept the cars and haul them to destination. More than 600 cars were waiting transfer across the border at Laredo alone on that date.

As this is written the situation has improved somewhat, there now being 466 cars on hand at Laredo.

Control of the transfer of cars across the Mexican boundary is essential for another reason. That is the tendency of the Mexican railroad authorities to delay return of the cars. They use them on their own lines and return them when in bad order. Hence it is necessary to limit the number of cars going across the border to approximately the number of the returns.

About two months ago the elected of-

ficers, supervisors and foremen were replaced by the former officers, and the former supervisory personnel took over their old jobs—and that is the reason things are going better.

There are numerous exemptions to the embargo alluded to above. Shipments of materials for railroad use, shipments going under government bills of lading, supplies for a number of Mexican contractors that are working under United

JUST FANCY

OPA has a new word marvel. It's "rationale" and is regarded by its lawyer-inventors as much smarter and fancier than "directive," "co-ordinator" etc.

The dictionary defines rationale as "an explanation or exposition of the principles of some opinion, action, hypothesis, phenomenon or the like. Now rare."

At OPA the word is defined as "a statement of considerations."

First rationale to be issued is one in which bowling alley operators are permitted to buy shoes to rent to patrons, "ten pairs of bowling shoes per alley for the first four alleys and seven pairs of shoes per alley for every alley above four."

One part of the order stipulates no pair of shoes may be rented or loaned for a period longer than 12 hours at a time to the same person. That should be long enough to let the hardest individual get his fill of bowling.

States contracts are exempted, while permits are issued in certain other instances. It is more a matter of controlling rather than of stopping the flow.

Not So Tough

Despite his tough exterior, there is no more tender-hearted man in Washington than Charles E. Wilson, former General Electric Co. president, who now is vice chairman of the War Production Board.

He feels his responsibility keenly and is applying pressure wherever it seems to be needed to make sure that our troops are supplied with plenty of everything so that they can get the war finished with the least possible expenditure of blood.

"I want to do a job now that will enable me to look the boys in the eye when they get back," he says. Then he chokes up and changes the subject.

Good Question

A very embarrassing question just has been handed on by the Civil Service Commission to the various federal agencies. The question is: "How many incompetent employes have you fired in the last five years?" The question is an entirely unnecessary one for everybody knows the answer, including the Civil Service Commission.

The answer is that government agencies do not fire incompetents. It just is not done. It is the habit to let a small percentage of incompetents coast along on the work done by the great majority.

The Civil Service Commission did not ask this question of its own invention. It was prodded into action by the Ram-speak Investigation Committee which is very much interested in the wasting of taxpayers' money through inefficiency in government. Now that the question has been asked, answers must be forthcoming. It will be very interesting to see what the heads of the various agencies will have to say on this matter.

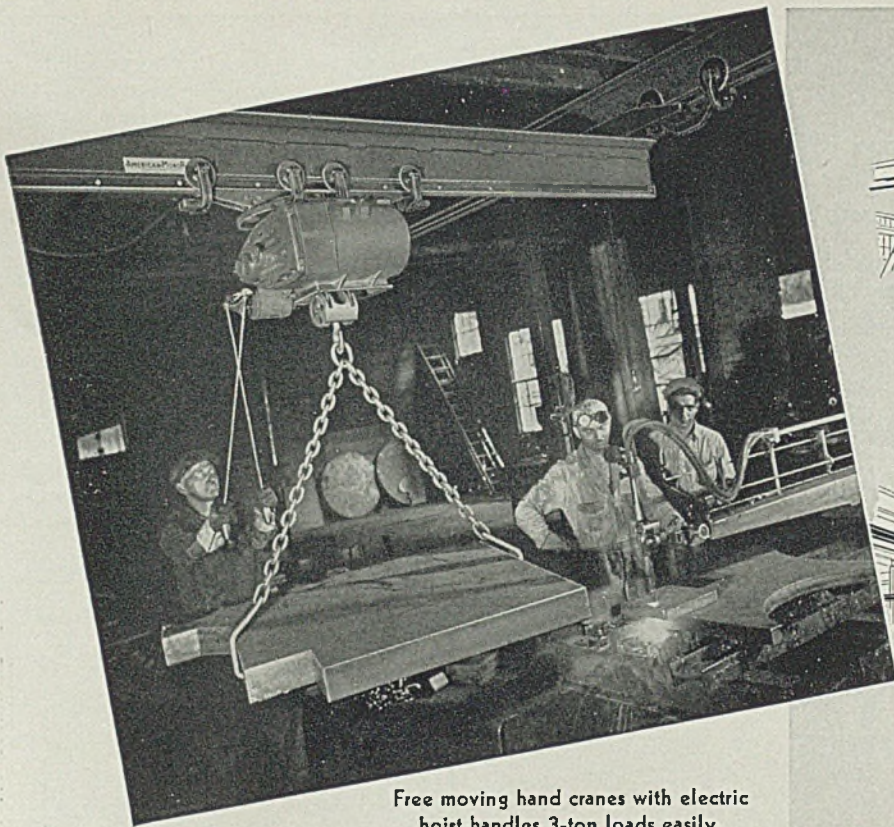
Bad Reputation

Uncle Sam always has had a bad reputation among the Indians for not keeping his word—and this failure to abide by solemnly executed treaties continues right up to the moment. In 1902 the government entered into an agreement with the Choctaw and Chickasaw nations to the effect that it would dispose of tribal lands in Oklahoma or, in the event of failure to make a proper disposition, take the lands over and pay for them out of public funds. The agreement never was carried out and the Indians are getting impatient over what they regard as unfair treatment to government "wards."

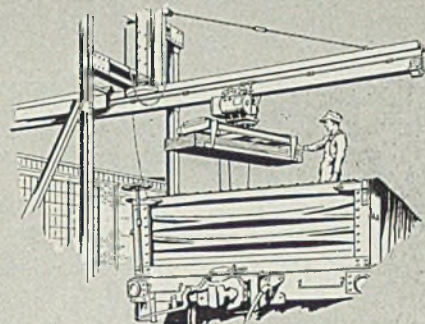
Now under discussion before the Senate Indian Affairs Committee is S. 314 introduced by Senator Elmer Thomas of Oklahoma. It is aimed to right this wrong.

A notable feature of these hearings is the impressive caliber of the tribesmen who come to state their reasons for asking passage of the bill. They include such men as Governor Kerr of Oklahoma, a member of the state supreme court and numerous others who occupy high places in the state government or in private industry.

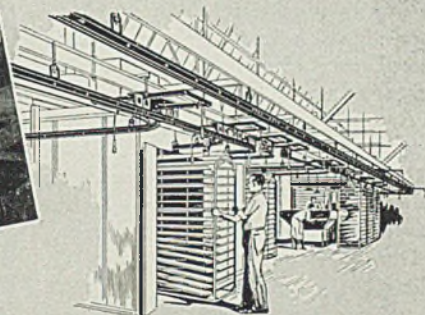
Under questioning, they tell an impressive story about the feats of Choctaw and Chickasaw Indians in this war. With respect to the coal involved, some of the witnesses said, there is enough of it in Oklahoma to supply the Southwest "for 100 years."



Free moving hand cranes with electric hoist handles 3-ton loads easily.



Unloading crane ties in with plant storage area.



Racks handle finished parts through drying ovens.

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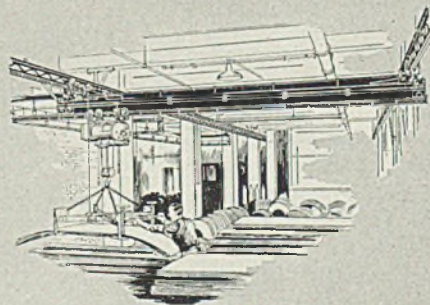
YOU can better your production NOW—later in the post-war period you will have essential equipment available for changes in product or process.

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What Will Be Done To Soften Shock of Transition to Peace?

Two bills now before legislators aim to intelligently handle the problems certain to develop in connection with the disposal of surplus war materials, machinery and plant with minimum disturbance to postwar business and industry

TO MAKE sure the problem of disposing of surplus goods of all kinds after the war will be handled intelligently and in a way to provide minimum shock to postwar business activities, Congress is expected, soon after it reconvenes after the summer recess, to take action on two bills aimed at this objective.

One of them is H.R. 2795, passed by the House on June 9. This is expected to come up for hearings before the Senate Committee on Expenditures in the Executive Department after Labor day.

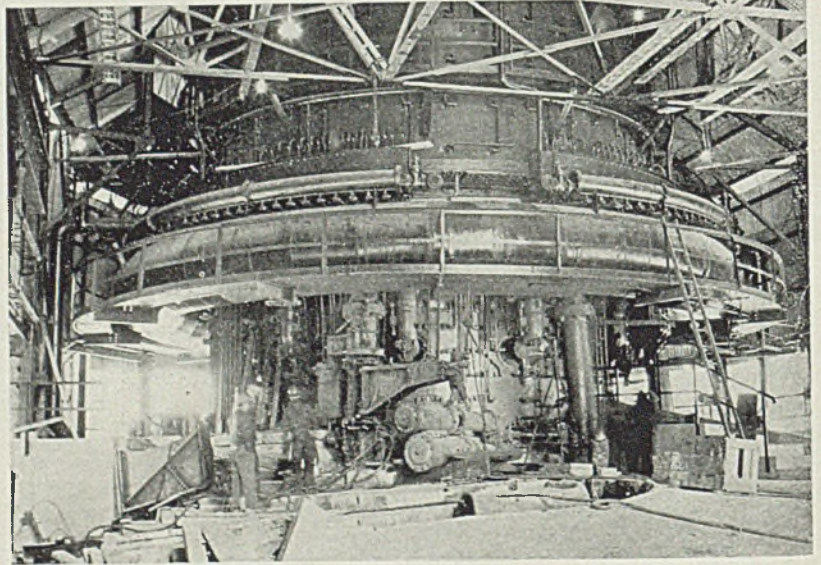
The other is H.R. 2959, which as yet has had no detailed consideration but which is sure to come up for hearings.

Under H.R. 2795 all surplus property in the hands of the Army, the Navy, the Maritime Commission and other government procurement agencies would be reported to the director of the Bureau of the Budget and the Procurement Division of the Treasury Department and the surplus property disposed of under regulations to be prescribed by the President.

By "property," as defined in this bill, is meant surplus machine tools and other equipment in government owned plants, as well as the huge inventories of a vast assortment of items of countless diversity that will be in the hands of the armed forces at the conclusion of the war. The bill exempts only government-owned land, buildings, "or their appurtenant facilities or fixtures or any gold or silver." The thinking at the capitol about postwar use of government-owned plants has not yet crystallized sufficiently to permit the shaping of legislation at this time.

H.R. 2795 merely is an instrument establishing machinery under which disposal of surplus government-owned property could be effected in an orderly and controlled manner. It is to be expected that the Senate will vote in favor of it and that the President will give it his signature. To guard against the possibility that the President and the government agencies given powers under this bill may not be misused, a safeguard is contained. The bill calls for establishment of a Surplus War Property Committee to be made up of five members of the Senate and five members of the House. It would be the duty of this committee "to undertake promptly a full and complete study and investigation of the types, quantities,

values, location and custody of war materials and other tangible property, both real and personal, acquired, held, or utilized for military purposes, which may reasonably be expected to be in the possession or under the control of any agency



BLAST FURNACE: Cast house of the new blast furnace at Columbia Steel Co.'s Ironton plant, near Provo, Utah, now is in operation. Furnace was moved piece-meal from Joliet, Ill., by this United States Steel Corp. subsidiary under government direction. Daily capacity is 950 tons

at the time of cessation of hostilities in the present war and no longer needed for such purposes." This study would start immediately after enactment of the bill and the committee would be required within six months at most to report results of its investigation and submit recommendations for further legislation aimed at insuring an orderly process of liquidation. This committee also would be charged with observing the administration of the act.

When H.R. 2959 comes up for hearings it is certain that many manufacturers will want to come to Washington to tell their stories. This bill provides for the "Disposition and Control of Surplus Aircraft by the Civil Aeronautics Board." This bill would place in the lap of the Civil Aeronautics Board the full responsibility of determining the disposition of

"unused or surplus aircraft owned by the United States, and the licensing of the import and export of aircraft so as to—

"Prevent, to the extent possible, any adverse effect upon the economic soundness, efficiency, or safety of the national and international air transport system of this country and any interference with the execution by the board of . . . this act;

"Meet the demand and need for aircraft or parts thereof by commercial operators of aircraft in the United States for the initiation and expansion of operations necessary to assure the sound and uninterrupted development of interstate and foreign commerce by air;

"Meet the demand and need for aircraft or parts thereof by persons in the

United States other than commercial operators of aircraft necessary to assure the sound and uninterrupted development of civil aeronautics;

"Prevent, to the extent practicable, the creation of burden upon other available markets for aircraft in the United States;

"Achieve and preserve the economic soundness, and production capacity for commercial military and other aircraft, of the aircraft manufacturing industry in the United States during and after conversion to a peacetime basis;

"The protection, to the extent possible, of the financial interest of the United States in unused or surplus aircraft;

"Meet the demand and need for aircraft or parts thereof by any foreign country or the citizens or subjects thereof;

"Meet any obligations assumed by the United States in any treaty, convention or

agreement that may be in force between the United States and any foreign country or countries; and

"Comply with other relevant national policies of the United States, particularly those in the field of foreign relations."

The bill calls for establishment of an Aircraft Advisory Board to consist of one member each from the following federal departments: Treasury, War, State, Navy and Commerce. It will be noted that under it the President is to have no authority whatever over disposal of surplus government-owned aircraft.

That Congress fully realizes that this process of disposal will offer difficult problems, particularly because airline operators will want to buy up this equipment

cheaply and get it in the air in large numbers whereas the aircraft manufacturers want it scrapped pretty largely and replaced by new planes to be manufactured after the war is over, is reflected by a provision for a fine up to \$10,000 and imprisonment up to two years for "any person who knowingly and wilfully violates any provision . . . for the purpose of injuring in any way the action of the board or for the purpose of obtaining a license, money, property, or anything of value."

H.R. 2959 was introduced June 15 by Representative Andrew J. May (D. Ky.). It was referred to the House Committee on Interstate and Foreign Commerce which will conduct the hearings on it.

That is the reason behind the decisions to kill off the National Youth Administration and the National Resources Planning Board and certain other agencies.

Congress is also worried over the inflation threat and it is safe to expect when it reconvenes after its summer recess it will take more effective action in this direction than up to this time. And what their constituents tell congressmen during the vacation will have a large bearing on what they do when they get back to Washington.

U. S. Treasury Loans Silver to Great Britain

Shipments of silver, totaling 3,075,000 ounces, supplied to Great Britain by the United States under lend-lease, have arrived in the United Kingdom to help relieve a serious shortage. The shipments, which were from stocks of treasury free silver, were made available to Great Britain with the understanding that they be returned on an ounce-for-ounce basis after the end of the war.

Britain's silver requirements for the first half of 1943, in addition to supplies from sources other than the United States and Canada, totaled 5,000,000 ounces, and of this Canada has agreed to supply 1,925,000 ounces. The United States and Canadian governments have indicated their willingness to supply additional silver to Britain for essential war uses, including coinage, as long as the silver is not more urgently needed in their domestic economies.

New Guide Issued on Use Of Construction Materials

A new issue of the Critical Construction Materials Guide, is now available from the Conservation Division of War Production Board. The new guide supersedes the issue of Feb. 19, 1943, and while the revisions involved are minor in most cases, the entire guide has been revamped and printed on a new format with new classifications.

In general, the tendency is to eliminate specific prohibitions and substitute for them general classifications under which WPB can either accept or reject applications for critical materials to be used in construction. The new form will permit considerable increase in flexibility and is intended to encourage construction engineers, architects and designers to use more critical materials where necessary and desirable and permit WPB to determine advisability of use. Previous editions encouraged the elimination of use of critical materials where possible.

Straw Shows Way Wind Blows

Failure to extend Guffey Coal act beyond the Aug. 23 deadline seen as reflecting mounting disposition of the legislative branch of the government to discourage widespread use of such bureaucratic controls in postwar era

WHEN Congress refused to extend the Guffey Coal act beyond Aug. 23, one of its principal reasons was that it wanted to discourage widespread use of such bureaucratic controls in the postwar world.

In taking its action, Congress upset administration officials who believe that such controls are necessary to prevent dislocations in the economy.

This point of view was brought out with particular emphasis when the House Ways and Means Committee questioned Howard A. Gray, deputy solid fuels coordinator for war. Mr. Gray is an appointee of Secretary Harold L. Ickes, who also holds the post of solid fuels coordinator for war. Representative A. Willis Robertson (D. Va.) asked Mr. Gray if he would favor a "Guffey act" for iron mines.

"If conditions in the iron mines are such as they were in the coal mines prior to the Guffey act, I would say 'undoubtedly, yes, sir.' But I know nothing of the conditions in the iron mines," Mr. Gray replied.

Then came these questions and answers:

Mr. Robertson: "How about copper mines? Do you favor the government exercising control over them and fixing it so they can pay any wage authorized by the War Labor Board and still come out on top?"

Mr. Gray: "If conditions were the same as they were in the coal mines prior to the passage of the Guffey act I say you should have regulation the same as under the Guffey act."

Mr. Robertson: "How about the manufacturers of steel? Suppose after the war is over they find they have a capacity of 100,000,000 tons and a market for 40,000,000 tons, and they are very much disorganized, just as disorganized as they were at the end of World War I, should the government step in and fix the price of steel too, in order to pay wages that were paid during the war to the steelworkers?"

Mr. Gray: "If the steel conditions are such as they are in the coal mines, I would say 'Yes, sir!'"

To show the way which the wind was blowing the following comment by Representative Wesley E. Disney (D. Okla.) is illuminating: "By that time (October, 1940) the coal industry had 'stabilized' itself so that it was making \$15,000,000 net. But the argument for establishing the bureau was that it was supposed to stabilize the industry. We do not want such stabilization extended into the postwar world. Nor did we want to extend the act now merely to stabilize John Lewis' wartime strikes and give him power to continue to say that only the government can operate the coal mines."

This and other portions of the record prove that Congress did not kill the Guffey act merely to force 1200 government employees off the payroll with an accompanying saving of \$3,000,000 a year, and to save 29 cents a ton to consumers. Congress is worried about federal domestic policies, about the arbitrary methods of government bureaus, about regimentation. Congress is worried over the need for high taxes.

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

CMP-24: Aluminum fabricators and distributors, including companies making rough pattern castings, now are required to show, as a part of their CMP allotment number, the quarter in which they are authorized to place their CMP allotment instead of the two digits representing requested month of delivery. They must show a requested month or date of delivery which must be no earlier than they will need the metal in accordance with their authorized production schedule.

They also are cautioned in accepting orders and in posting them to form CMP-24 to be sure that these are transcribed correctly and that the customer has given what appears to be a reasonable program number. Their attention is directed to the provision which requires them to report to WPB all orders undelivered more than 30 days after the end of the requested month of delivery.

The large amount of unfilled orders reported by many fabricators, particularly foundries, indicates they have not observed the provision stating that no producer (except those operating under specific WPB production directives) shall accept a total order load for any month in excess of 105% of his capacity.

WIRE MILLS: Clarifying a recent report, Copper Division has issued the following statement: "All direct shipment orders placed on wire mills by warehouses which bear only preference ratings were automatically cancelled by wire mills when CMP became effective July 1. However, electrical warehouses may ship on both authorized controlled material orders and preference rated orders under CMP regulation No. 4, provided shipment is made from warehouse stock."

PREFERENCE RATING: Assignment of an AA-1 preference rating for all of the 100-octane aviation gasoline plants that are scheduled for completion in 1943 has been announced. Some of these projects previously had an AA-2X rating.

DISTRIBUTORS' FORM: WPB-547 now supersedes form PD-1X, used by distributors in obtaining priority assistance for replacing inventories. PD-1X applications will be accepted for processing until Aug. 1; after that date, only WPB-547 will be valid.

CMP REGULATIONS

HAND TOOLS: Employes may use under specific circumstances CMP regulation No. 5 preference ratings assigned to their employers for maintenance, repair and operating supplies, to purchase hand tools required to retain or obtain employment. Employers are permitted to purchase such items as hand tools for release to employes, even though this has not been a customary business practice in the past.

An AA-1 preference rating is granted to radio communications by including this activity in Schedule I. Analytical, research, testing and control laboratories have been removed from Schedule I of the regulation and are thereby denied use of AA-1 preference rating. Persons producing identification plates, emblems, badges, pin tickets and tags have been granted use of the AA-2 rating for MRO supplies by the inclusion of such activities in Schedule II. (CMP No. 5)

COPPER WIRE: Farmers may obtain "Copper Wire Allotment Certificates" from USDA War Boards on basis of applications which show actual need of copper wire for farm operations in excess of the 75 feet permitted under Priorities regulation No. 19. Retailers may place orders on warehouses or mills for the amount of wire shown on the certificate and attach the certificate to the order. Order is then an au-

thorized controlled material order. If retailer prefers, he may place an authorized controlled material order for amount of wire shown on the certificate by placing on his order the allotment number appearing on the "Copper Wire Allotment Certificate," followed by the quarterly identification and endorsing the order with a prescribed certification. (CMP No. 1)

E ORDERS

MACHINE TOOLS: Order E-1-b has been amended to prevent under any circumstances shipment of machine tools to dealers for stock. Sequence of delivery among the 25% of production allotted to foreign and "other-than-service" purchasers is now determined by date of receipt of the preference rating certificate, whenever the rating is A-1-a or higher. If lower than A-1-a, sequence of deliveries is determined by preference ratings. (E-1-b)

INDEX OF ORDER REVISIONS

Subject	Designations
Carriages, Baby	L-152
Coolers, Water	L-126
Dehydrators, Food	L-308
Facsimiles	PR No. 7
Fence Posts, Steel	L-211
Heat Exchangers	L-172
License Plates	L-32-a
Sewerage Facilities	P-141
Sterilizers	L-266
Tools, Hand	CMP No. 5
Tools, Machine	E-1-b
Trucks, Industrial Power	L-112
Welding Equipment	L-298
Wire, Copper	CMP No. 1, L-63

Price Regulations

Copper Scrap	No. 20
Machinery	No. 136

L ORDERS

LICENSE PLATES: States are permitted to use metal on hand, or sheet and strip steel not heavier than 22 gage and listed as idle or excess inventory with Steel Recovery Corp., for purpose of manufacturing one 1944 license plate per motor vehicle. Specific authorization of WPB must be obtained to purchase steel listed with the corporation. (L-32-a)

COPPER WIRE: All bare or insulated wire or cable for electrical conduction, made from copper or copper-base alloy, in distributors' stocks have been released from inventory restrictions of order L-63. Inventory control is now exercised by WPB under CMP regulation No. 4. (L-63)

POWER TRUCKS: Purchase orders for used industrial power trucks must be authorized by WPB before they can be accepted. Authorizations of acceptance are made on form WPB-1319 (formerly PD-556). (L-112)

Additional manufacturers of industrial power trucks have been placed on the list of those who make models which are approved by WPB and come within provisions of L-112. Limitations have been placed on specifications applied to fork-type models of power trucks, limiting the height of the lift and length of the forks on the trucks. (L-112-a)

WATER COOLERS: Production of special self-contained drinking water coolers for use aboard ship is permitted for an indefinite time.

Originally the exception expired on July 6. (L-126)

BABY CARRIAGES: Production schedules for third quarter have been set at 289,622 baby carriages and 265,400 strollers, walkers, and sulkies compared with 289,369 and 233,500, respectively, for second quarter. Sitting vehicles require about one pound of metal per unit while carriages require from 6 to 9 pounds for single and 12 pounds or more for twin types. (L-152)

HEAT EXCHANGERS: Coverage of order L-172 has been broadened to include additional types and sizes of heat exchangers. The order makes a distinction between the most critical types and others by requiring specific authorization by WPB before an order can be placed with a manufacturer for certain heat exchangers. Applications for authorization to purchase Group 1 exchangers must be made on WPB-1475 (formerly PD-615). Orders for all other exchangers must bear preference rating of AA-5 or higher. (L-172)

STEEL FENCE POSTS: Number of styles has been reduced from about 75 to less than 20, resulting in an estimated saving of about 6000 tons of steel. (L-211)

STERILIZERS: Schedule A of order L-266 has been enlarged to include additional sizes of pressure sterilizers of the cylindrical, rectangular and water pressure types, and non-pressure sterilizers, which may be produced. Restrictions on use of critical metals in certain types of sterilizer equipment are eased. (L-266)

WELDING EQUIPMENT: A new order sets up procedure for establishing a national reserve pool of used idle resistance welding equipment which must be tapped first to meet demands before new equipment can be purchased. Owners must register with WPB on form WPB-2732 equipment which has not been used more than 120 hours during a period of 90 consecutive days. Manufacturers must report on WPB-2830 on or before 15th of each month all purchase orders for new and rebuilt equipment and repair parts unfilled, received and cancelled during the preceding month. Manufacturers and dealers are prohibited from accepting orders for delivery of any new equipment unless the order or delivery is specifically authorized on WPB-2752, except in cases of: purchase orders of \$200 or less; orders for resistance welding electrodes; orders for equipment for direct use by Army, Navy, Maritime Commission, or War Shipping Administration; orders bearing preference ratings assigned under order P-19-h; or orders placed by manufacturers or dealers in resistance welding equipment. (L-298)

FOOD DEHYDRATORS: Production quotas have been assigned to 31 manufacturers of domestic food dehydrators in self-contained units. Initial production of 89,000 units plus parts must be completed by Sept. 1. (L-308)

P ORDERS

SEWERAGE FACILITIES: Order P-141 as revised covers only sanitary systems operated separately or combined with a storm sewerage system. Other sanitation services are covered by CMP regulation No. 5A. The order now assigns: preference rating of AA-1 to supplies for MRO, and lowest rating given to a rated project to construction of sewage facilities to serve such project, provided commencement of construction is authorized by WPB; prescribes: method for obtaining controlled materials in specified forms and shapes and a certification for use in applying the AA-1 rating and allotment symbol by an operator to deliveries of materials for use in MRO; provides that ratings assigned by the order may be extended by a supplier by use of the certificate prescribed in Priorities Regulation No. 3, and the ratings assigned to extensions of systems to serve rated projects may be applied by use of the certification prescribed in Priorities Regulation No. 3; establishes the year 1942 as the base year for determining MRO expenditures; provides that an operator whose cost for supplies in MRO in 1942 were \$1000 or less and who anticipates that that amount will not be exceeded in the year under consideration is exempted from quarterly limita-

tions; provides for increase in expenditures for MRO proportional to increase in dry weather flow from year to year and also for expenditure for repairs in excess of ordinary allowances, following calamitous circumstances; cost of the \$1500 and \$500 limited extensions and expansions must be included with other expenses for MRO supplies; restrictions upon construction of extensions to serve customer premises have been eliminated from the order, provided that no iron or steel pipe is used by the operator except in minimum quantities required in making necessary connections. (P-141)

PRIORITIES REGULATIONS

FACSIMILES: Use of facsimile signatures on purchase or delivery orders wherever a signature is required by a WPB order or regulation is permissible. (PR No. 7)

PRICE REGULATIONS

COPPER SCRAP: Uniform limit to fees and charges made for conversion of copper and copper-alloy scrap in toll transactions has been established. The charges must not exceed the difference between the maximum price for scrap metal and ceiling price of refined copper. (No. 20)

MACHINERY: Effective period has been extended for provision in price regulation No. 136, permitting wholesalers to adjust their maximum prices on certain items, if they were based on lower manufacturer's prices than those in effect on Oct. 1, 1941. Effective July 23, a wholesaler is allowed to increase his base date (Oct. 1, 1941, for machines and parts listed in Appendix A and March 31, 1942, for those listed in Appendix B of the regulation) selling price by same percentage as the manufacturer increased the price to him. (No. 136)

Appointments-Resignations

Sidney J. Weinberg has resigned as assistant to chairman of the War Production Board.

• • •

Roy W. Johnson of Stamford, Conn., has been appointed deputy director of the Facilities Bureau, War Production Board. He succeeds Col. Gordon E. Textor who has returned to duty with the U. S. Corps of Engineers.

• • •

Richard O. Fischer of Chicago, has been appointed deputy director of Division of Railway Transport, Office of Defense Transportation.

• • •

John Downing has resigned as assistant director of the Marketing Division, Petroleum Administration for War.

• • •

Paul M. Green has been appointed director of the Accounting Division of the Office of Price Administration, succeeding Herbert F. Taggart who has accepted a major's commission in the Army.

• • •

James E. Pew has been appointed assistant director of the Division of Natural Gas and Natural Gasoline, Petroleum Administration for War. Mr. Pew succeeds Paul W. Raigorodsky who resigned on June 30. Succeeding Mr. Pew as chief of the Natural Gas section is Charles E. Webber.

Bureau of Planning and Statistics Combines Functions of Three Groups

FORMATION of a Bureau of Planning and Statistics, combining the functions of the former Division of Statistics, Planning committee, and Office of Progress Reports has been announced by Charles E. Wilson, executive vice chairman, War Production Board.

Stacy May remains director of the Division of Statistics and becomes director of the new bureau. Simon Kuznets, who has been acting chairman of the Planning committee, is associate director of the bureau and director of the new Planning Division. This division will appraise the overall production capacity of our economy, relating the flow of resources to military production with civilian and indirect military requirements.

M. Joseph Meehan, who has been director of the Office of Progress Reports, is director of the Progress Division, the functions of which remain unchanged.

Division of Statistics will have these three assistant directors: M. A. Copeland, in charge of Munitions Branch; E. B. George in charge of Materials Branch; and V. D. Reed in charge of Industry and Facilities Branch. R. W. Trunley, who was administrative Officer of the Division of Statistics, is administrative officer of the bureau.

Bureau of Planning and Statistics, which reports directly to vice chairman Donald D. Davis, will recommend plans and policies for effective mobilization of industrial resources and essential civilian production. It also will appraise the feasibility and balance of production objectives and effective implement of policy, and will compile statistics and other information relating to these tasks.

A specific duty of the bureau will be to compile a *Materials Handbook*, recording quarterly estimates of supply and demand for major industrial materials. It will prepare reports on changes in these estimates during the quarterly periods.

Reorganization of the WPB Lumber and Lumber Products Division also has been announced. J. Philip Boyd is the director and Mathias W. Niewenhaus is deputy director. The division now consists of the following three branches: Program Branch with Henry Clopper as chief and Albert C. Cline as head of a Requirements Section. It also has a Statistical Section; Operations Branch with Harold E. Holman as acting chief; and Marketing Control Branch with J. N. Winton as chief.

War Production Drive Headquarters has announced extension of Labor-Man-

agement Production committees to 2100 war plants, employing 4,556,150 workers, through addition of 200 committees which have registered recently with Drive Headquarters.

WPB Appoints Industry Advisory Committees

Director of Industry Advisory Committees, War Production Board, announces formation of the following industry advisory committees:

Malleable Iron

Government presiding officer is George F. Hacker. Committee members are: C. S. Anderson, Belle City Malleable Iron Co., Racine, Wis.; L. A. Dibble, Eastern Malleable Iron Co., Naugatuck, Conn.; Charles A. Gutenkunst Jr., Milwaukee Malleable & Grey Iron Works, Milwaukee; A. F. Jackson, Michigan Malleable Iron Co., Detroit; W. H. Moriarty, National Malleable & Steel Castings Co., Cleveland; K. M. Smith, Lancaster Malleable & Steel Corp., Lancaster, N. Y.; John Wagner, Wagner Malleable Iron Co., Decatur, Ill.

Range Boiler and Tank

Government presiding officer is Vincent T. Manas. Committee members are: T. M. Bohan, Whitehead Metal Products Co. Inc., New York; M. H. Feldman, John Wood Mfg. Co., Chicago; K. P. Fuhrmann, Wheeling Steel Corp., Portsmouth, O.; R. E. James, Rheem Mfg. Co., Sparrows Point, Md.; Wesley Martin, A. O. Smith Corp., Milwaukee; E. Sedlachek, Scaife Co., Oakmont, Pa.; A. R. Hanson, L. O. Koven Inc., Jersey City, N. J.; D. D. Smith, Porcelain Steels Inc., Cleveland; O. S. Wessells, D. D. Wessells & Sons Co., Detroit.

Dump Body Hydraulic Hoist Manufacturers

Government presiding officer is John E. Graham. Committee members are: A. F. Brooker, Daybrook Hydraulic Corp., Bowling Green, O.; Harry Cobey, Perfection Steel Body Co., Galion, O.; Gerald S. Connelly, General Body & Hoist Co., Everett, Mass.; W. H. Hammond, Gar Wood Industries Inc., Detroit; B. J. Heiser, Galion Allsteel Body Co., Galion, O.; G. H. Herr, Marion Metal Products Co., Marion, O.; Richard R. Howard, Anthony Co. Inc., Streator, Ill.; E. P. Monroe, Hercules Steel Products Co., Galion, O.; W. S. Scruggs, St. Paul Hydraulic Hoist Co., Minneapolis; H. A. Stoller, Heil Co., Milwaukee.

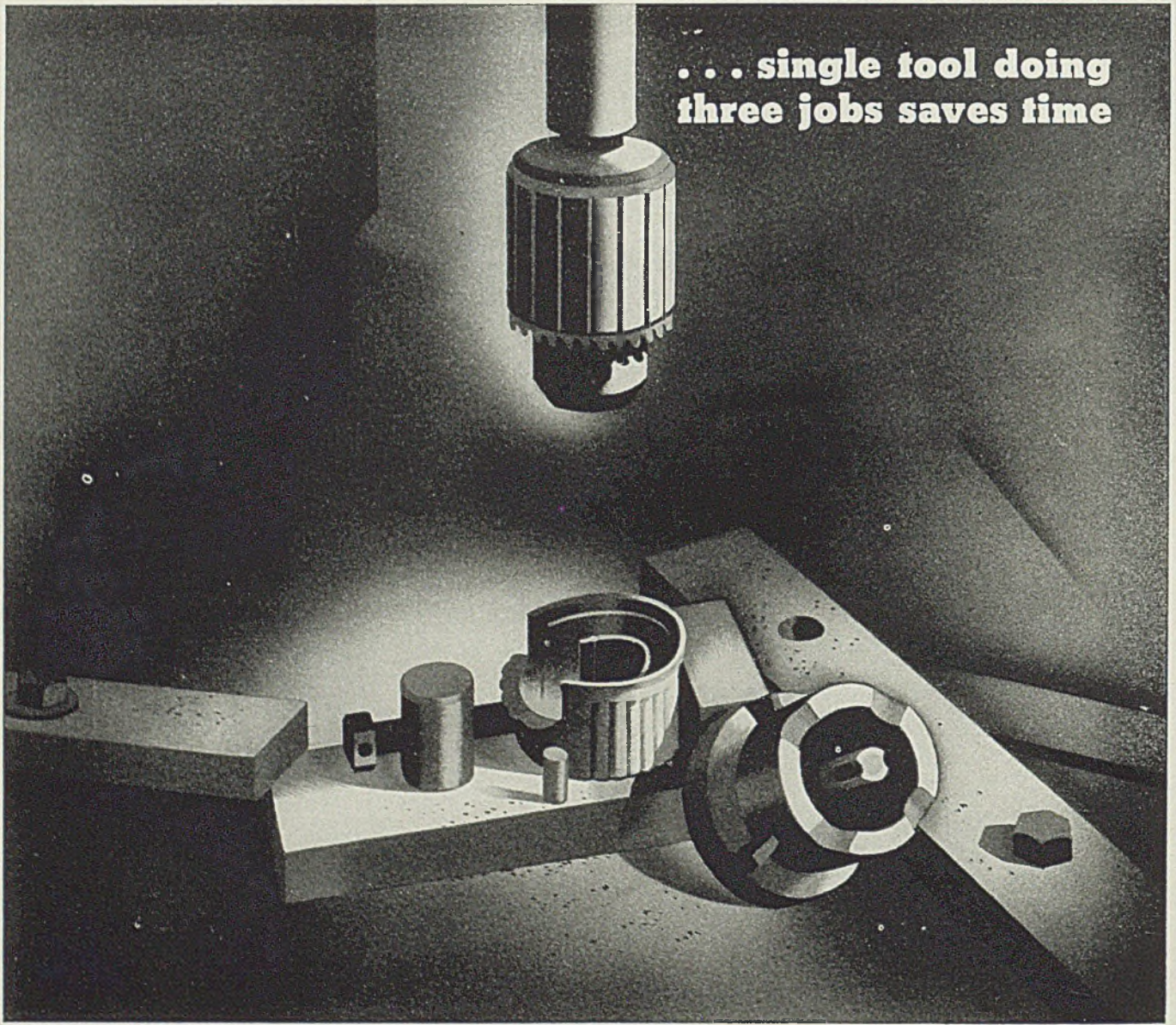
Farm Machinery and Equipment Transportation

Government presiding officer is James W. Crofoot. Committee members: J. R. Dreffer, traffic manager, New Idea Inc., Coldwater, O.; F. L. Fisher, traffic manager, Starline Inc., Harvard, Ill.; M. L. Gibson, assistant traffic manager, International Harvester Co., Chicago; W. P. Mertsching, traffic manager, James Mfg. Co., Fort Atkinson, Wis.; H. J. Schroeder, general traffic manager, Deere & Co., Moline, Inc., and J. C. Shoemaker, traffic manager, Buckeye Incubator Co., Springfield, O.

Bearing and Bushing

Government presiding officer is R. L. Vaniman. Committee members: Frank I. Bowles, Kendrick Mfg. Co., Detroit; B. A. Brown, Moraine Products division, General Motors Corp., Dayton, O.; Ray F. Crom, McQuay-Norris Mfg. Co., Indianapolis; P. J. Flaherty, Johnson Bronze Co., New Castle, Pa.; H. O. Johnson, Bound Brook Oilless Bearing Co., Bound Brook, N. J.; A. J. Langhammer, Amplex division, Chrysler Corp., Detroit; James L. Meyers, Cleveland Graphite Bronze Co., Cleveland; David W. Rodger, Federal-Mogul Corp., Detroit; and L. G. Hooker, Detroit Aluminum & Brass Corp., Detroit.

**. . . single tool doing
three jobs saves time**



Information supplied by an Industrial Publication

One of the best ways of expediting machining is the use of tools that make several cuts simultaneously. True, such tools must usually be specially designed, but the time saved more than compensates for the effort of developing them.

A tool developed to do three operations simultaneously on an aluminum die casting is a good example. It is a combination drill, miller and facing cutter.

The drill which cuts flash from the center hole is in the middle. It is surrounded by a four-tooth

hollow mill which removes push-out pins at the bottom of the annular recess between the inner and outer walls. Above the mill, on a flange, are four cutters that remove flash and face the top edge of the casting.

All of these operations are performed with the tool in a drill press spindle, the work being held by a simple fixture. The time saving between this method, requiring a single set-up and a single stroke of the drill press spindle, and the use of three set-ups and three tools is obvious.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.



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

Climax Molybdenum Company
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New model automobiles always were long in "conversational" stage in prewar days and they again are becoming popular subjects for discussion. . . . "Inside" information is once more beginning to be passed around about new designs and plans

"CONVERSATIONAL" new models have been built by the automotive industry almost ever since it was considered an industry, and they are again becoming popular discussion subjects. In prewar days, there was always a new model just around the corner—a new \$300 Ford, or a new streamlined Packard, or a Buick Torpedo, or a new light Nash. Some of them finally turned out to be the real thing, months and often years after they hit the conversational stage; others never did see the light of day, but nevertheless discussion of them was usually based on actual development work. Various reasons could be ascribed to their ultimate demise. Perhaps the sales department decided the market did not justify the cost. Perhaps bugs developed in an engine or in a frame or a body. Or perhaps the brass-hat department concluded to write off the development expense and start on something else.

Suppliers Were "In"

Suppliers of materials, parts and equipment to the motor industry were "in" on many of these new car projects. They had to be, in order to furnish estimates on new equipment lines, or new steel sections, or new castings. Discussion of new models was often the conversational stock-in-trade of these people. They could tell you all about a new light Ford, or a new line of streamline bodies which GM was developing, or a new Chrysler transmission, often long before the sponsors of such developments had actually decided to go ahead.

Obviously it is a long distance from the discussion of a proposed new model to its appearance on salesroom floors. Everyone in the industry is fully aware of this, but many of the general public are prone to believe that as soon as they hear about a new car model it is time to go out and place an order.

All this is prefatory to the point that the industry today is just about into the new model conversational stage. "Inside" information is once more beginning to be passed around Detroit about new model designs and plans. Some of this discussion is centered around specific builders, which is pretty certain proof that practically all units of the industry are finding some time to shape plans for automobile production once it can be resumed.

There is nothing particularly unpa-

triotic about this. After all, the design engineers and the stylists and the master mechanics are there on the job every day, and if war production has progressed to the point where they have some free time, what is more natural than to turn to new car model planning? Officially

THE WOMEN

One job in every three at Cadillac Division, General Motors Corp., is now performed by a woman, which is in sharp contrast to peacetime conditions when no women were employed in Cadillac plants. Even a year ago there were only 44 women employed in tank and aircraft engine work. From a modest start in inspection departments, women now are classified in nearly all types of jobs from sweepers to crane operators.

Speaking of women, Mrs. Bernice Palmer, Detroit, who nine months ago ran a confectionery store and who now works in the Packard Rolls-Royce plant has been deluged with 1700 suggestions for solving a production difficulty after her problem was pictured in a recent issue of a popular weekly magazine. However, a solution worked out by the Packard process department proved more practical than any of the 1700 diagrams, blueprints, descriptions and working models which Mrs. Palmer received.

the motor companies will deny they have any concerted new model activity, but nevertheless there is plenty of unofficial work taking shape.

For example, creditable reports indicate Lincoln has put the finishing touches on ten hand-built jobs for post-war production. They resemble closely the last of the 1942 models the company built. The cars are said to be full-size models, of regulation materials, but of course did not come off production dies, since these are not available. Parts like fenders, hoods and body sections can be shaped over wood form blocks to sufficient accuracy for experiments.

Ford likewise is reported to be pushing new car design activity a little more

strongly. An engineering group formerly busy on tank and aircraft engine development now is spending some time on the perfection of a 5-cylinder in-line engine for use in what appears to be a new Ford model in the low-price field. Many engineers will tell you the 5-cylinder engine is better balanced than either a four or a six to give smooth, vibrationless performance, and of course would show some economy over a six. There are no particular construction difficulties in such an engine, the crankshaft throws being spaced 72 degrees apart, and firing order 1-5-2-4-3.

Fragmentary reports on the car itself include such features as transverse double-action leaf springs, which permit removal of shock absorbers; tubular steel frame supporting a full-size 5-passenger body; two-speed transmission designed to permit the countershaft to be free in direct drive, thus contributing to economy.

Product of Continued Research

It should be emphasized that this development work is nothing which may have originated in the last four or five weeks, but is more likely a part of a continuing program of research and development on which a little added emphasis is being placed at the moment. It would likely take six months to a year from the word "go" to put such a proposed car in production. Meanwhile the regular Ford, Mercury and Lincoln lines would go back into production, although conceivably the 5-cylinder job could take the place of the Ford six which was more or less interchangeable in Ford chassis with the V-8.

As far as is known, the industry has never built a 5-cylinder engine, but for the past few years Mr. Ford and some of his engineers have been reported "intrigued" by its possibilities.

Experiments likewise are understood to be in progress on the adaptation of the Ford 12-cylinder aircraft engine to wing mounting in airplanes. This type of mounting calls for a flat pancake-type engine, enclosed by the airfoil and obviating the necessity for nacelles. To adapt a V-12 to such a mounting it would be necessary to "open up" the Vee sufficiently to make the front profile more nearly flat.

This is the type of engine which originally was scheduled to be built in the new plant of the Liquid-Cooled Engine Division of Aviation Corp. in Toledo, O., a project which was canceled by the WPB several months ago. The plant was well along toward production, but personnel has now been transferred to other divisions of the corporation,

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or has obtained positions with other manufacturers, and the operation now is scheduled to be taken over by Packard for production of certain components of the Rolls-Royce Merlin aircraft engine.

The latter deal has not been worked out to the complete satisfaction of Army, Navy, DPC and other interested parties, but it has progressed to the point where the name of a proposed plant manager is freely mentioned in equipment circles, although without any confirmation whatever from Packard.

Packard Expansion Moving Along

It will be recalled that a major expansion in production schedules for the Rolls-Royce was requested of Packard late last year and this is now well along toward accomplishment. The engine apparently has met high favor with both British and American air force officials and is being installed in additional types of planes. News reports only last week indicated the Rolls-Royce with new type supercharger was used in the North American P-51 Mustang in the Sicilian engagement, under the new Air Force designation of attack bomber, A-35. Normally the P-51 has carried an Allison engine.

Certain suppliers of aircraft engine parts report that a move is on foot to debit vendors for gasoline used in engine tests which develop faults in parts supplied by such vendors. In view of the enormous quantities of gasoline used in such test cell operations, this charge conceivably might be plenty high.

There is an interesting story behind the assumption of operations at a Grand Rapids, Mich., ex-furniture plant by the Saginaw Steering Gear Division of General Motors, where the new M30 carbine

has been in production for the Army for the past four or five months. Originally this plant was set up as the Irwin-Pederson Co. with the idea of bringing an important new arms industry to Grand Rapids in answer to pleas by civic leaders and state officials. The Irwin family has been identified with the furniture industry of Grand Rapids for many years, and one of the plants owned by the family was cleaned out and retooled for carbine production. Pederson is an inventor and specialist in design of firearms who now operates the Pederson Arms Co. in New York. He was active in the development of the .30-caliber carbine which already has proved to be a welcome addition to U.S. weapons.

Tooling of the Grand Rapids plant was completed over a year ago and the company set about organizing its personnel and lining up material. But for some strange reason, after the passage of 12 months, there were still no carbines coming from the plant. Difficulty was said to have been principally one of management, but that is beside the point now. At any rate, army officers were considerably ruffled over the situation and decided to lay down the law, giving the plant 30 days to produce "or else." It proved to be the latter alternative, so Saginaw Steering Gear was asked to step into the situation. This division of GM has been producing .30-caliber machine guns in one of its Saginaw plants for several years and performed an exceptionally speedy task in assimilating this contract, along with three other GM divisions which had contracts for the .30 and .50-caliber Browning.

Within a few weeks, the Grand Rapids plant was in production and output has been rising steadily for the past four months. The incident is one of many

examples of the difficulties the Army has experienced in converting a plant unfamiliar with metalworking operations and volume production technique to arms manufacture, and of the valuable assistance which automotive "know-how" has given to the war program. Doubtless there are other examples which could be cited of just the reverse situation.

In assuming operation of the plant there was considerable reshuffling of personnel, but Mr. Irwin is still active there in a purchasing capacity, and Mr. Pederson spends some of his time with his New York connection and also in development work on an entirely new type of infantry gun, some preliminary work on the latter being handled by a Detroit engineering firm.

Foundries Use Substitutes With Cereal Binders Short

War production in thousands of foundries has not yet been curtailed by shortage of cereal binders. Many shops are successfully utilizing certain substitutes.

These substitutes vary, depending on type of foundry and availability of material. Substitutes include: Dextrine; synthetic resins, by-product of the sulphite paper process known as lignin, soy-bean meal and rosin base binders.

Requisitioning of the 90 mid-western terminal elevators' corn stocks by the War Food Administration has enabled corn refiners to keep plants operating. WFA officials can supply refiners with enough corn to keep plants open until the end of July. Between eight and ten million bushels of corn are now either at the plants or on the way.

However, stretching out this supply until the end of the month will mean cutting out less essential products.

Kaiser's Fontana Plant Reporting New Records

Production records at Kaiser Co. Inc., Fontana, Calif., are being broken. The blast furnace delivered 1236 tons on July 2 though it is only rated at 1200 tons. Four 150-ton open hearths made 1710 tons on July 6—just 140 tons short of the combined rated daily capacity of the 6-furnace shop.

Electric Steel Plant on Coast Boosts Operations

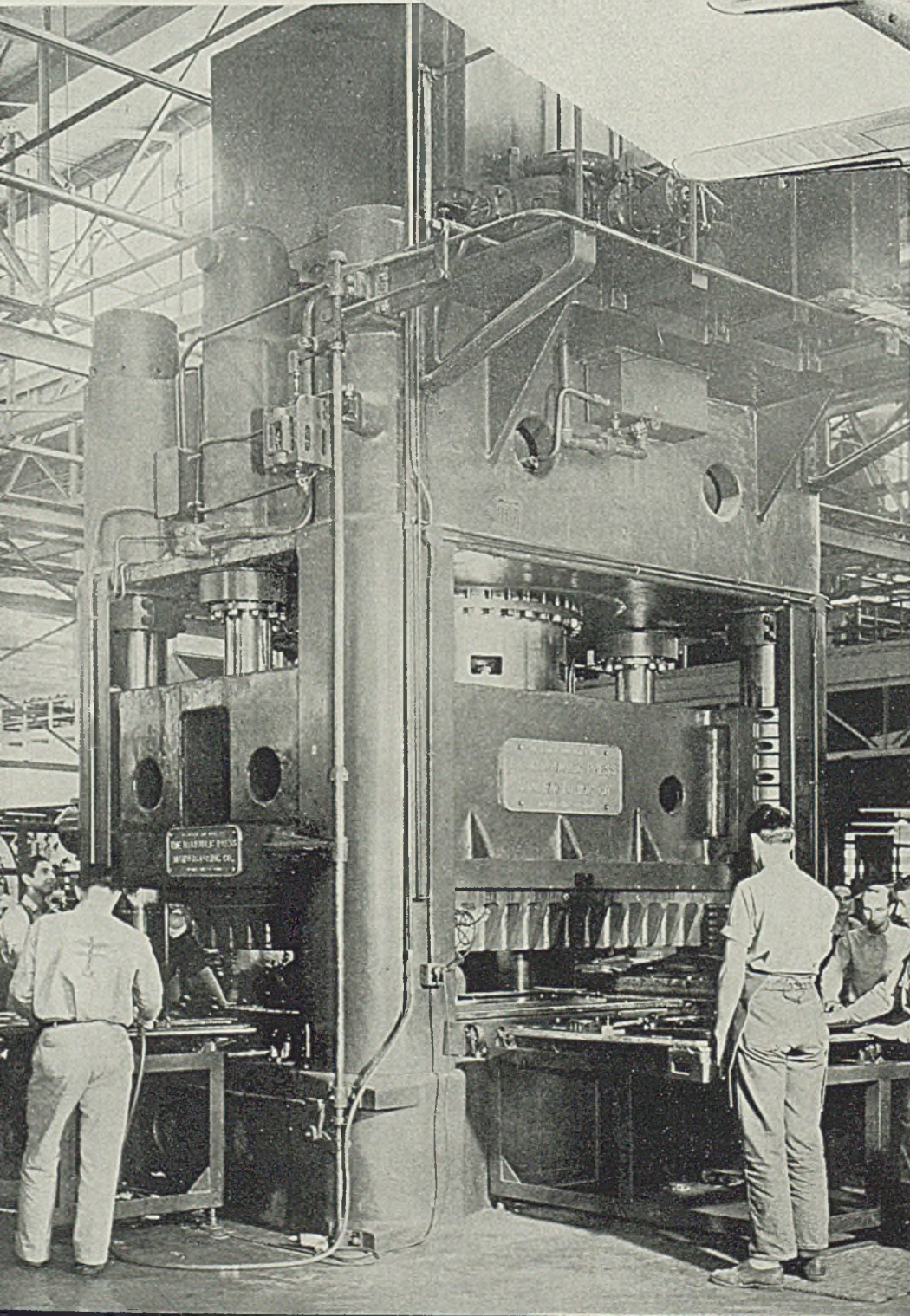
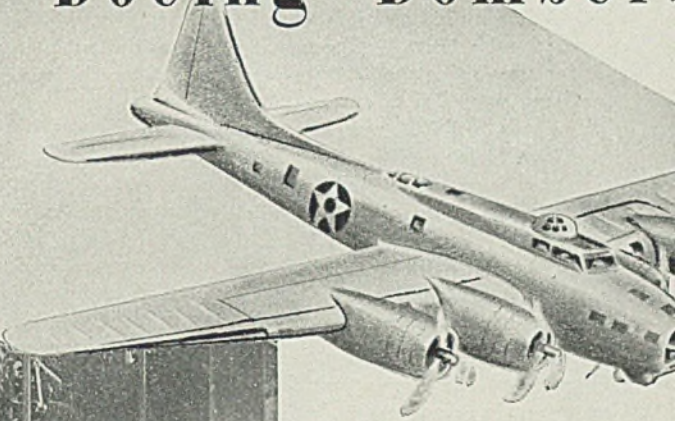
Melt shop of the Oregon Electric Steel Rolling Mills, Portland, Oreg., now is in operation on two shifts; the third shift will be added within the next three weeks when the 9-inch merchant mill starts rolling.



SEALING TANKS: These tanks are being readied before loading on flat cars at Ford's Richmond, Calif., plant. This is a general view showing women sealing the tanks shortly before shipment

HPM**FASTRVERSE PRESSES**

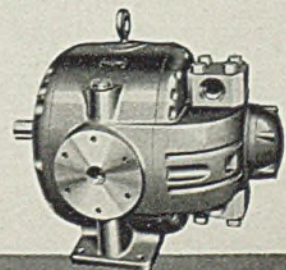
are responsible for the mass
production of Boeing Bombers



This H-P-M FASTRVERSE rubber pad forming press is one of many H-P-M presses turning out thousands of formed metal parts for Boeing bombers and trainers. Final victory depends on the continuous operation of these presses. There is no time for shut-downs! That's why H-P-M designs and builds the hydraulic pumps for generating pressure to operate H-P-M presses. There's no chance for undivided responsibility! When you buy an H-P-M FASTRVERSE press, you buy guaranteed press performance.

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Little mention made of new military plane models. . . In heavy bomber field two superplanes are reported nearing production. . . Lockheed's tieup with Pacific Finance seen as step to facilitate postwar financing of private plane sales

RECENT Office of War Information report on American air transport (STEEL, June 21, 74) mentions nothing, of course, about new military plane models nearing production. In the heavy bomber field, for example, are two superplanes on which the most rigid censorship has been clamped by the Army Air Forces. However, as usual, this restriction seems to have been partially broken by mention of the planes in British publications, and in the June 11 issue of the *United States News* they were mentioned specifically as the B-29, successor to the Boeing B-17 Flying Fortress, and the B-32, successor to Consolidated B-24 Liberator.

Two comparatively new medium (two-engine) bombers are the Vega Ventura, PV-1, now being supplied to the Navy, and a new Douglas attack bomber. Greater emphasis appears to be in process on the two-motor bomber by both Army and Navy, with some easing up on dive bomber types.

Lockheed Aircraft Corp., Burbank, Calif., announces purchase of the majority interest in Pacific Finance Corp. of California, reportedly to facilitate the sale of private planes when the war ends, but more likely to help finance the sales of certain types of consumer goods other than airplanes which Lockheed may be manufacturing come peace. Lockheed obtained control of Pacific Finance by purchasing the holdings of Transamerica Corp. and associates, involving 381,205 shares of stock valued at \$15.25 per share, or a total investment by Lockheed after retirement by Pacific Finance of common shares, of \$3,750,000.

Transamerica Corp. is a holding company tied in closely with the Bank of America, probably the largest West Coast banking interest, founded by the Gianini family in San Francisco. Bank of America and Transamerica Corp. have extensive industrial holdings, including the Enterprise Engine & Foundry Co. of San Francisco, and General Metals Corp. of Oakland and Los Angeles, both at new production peaks by virtue of war contracts. Bank of America also handles finances of the Henry J. Kaiser interests which spread nearly the full length of the West Coast and are continually expanding. There is considerable talk of actual financial connection between Kaiser and Bank of America, but this is denied by sources close to some of the Kaiser interests.

Speaking of the acquisition of Pacific

Finance, Robert E. Gross, Lockheed president, offered the rather vague statement that, "While all our efforts and facilities currently are dedicated to building airplanes to help win the war, we must look forward to the day when our industry will have new responsibilities to the nation's society and economy." That could mean a lot of things.

Set Aside Postwar Fund

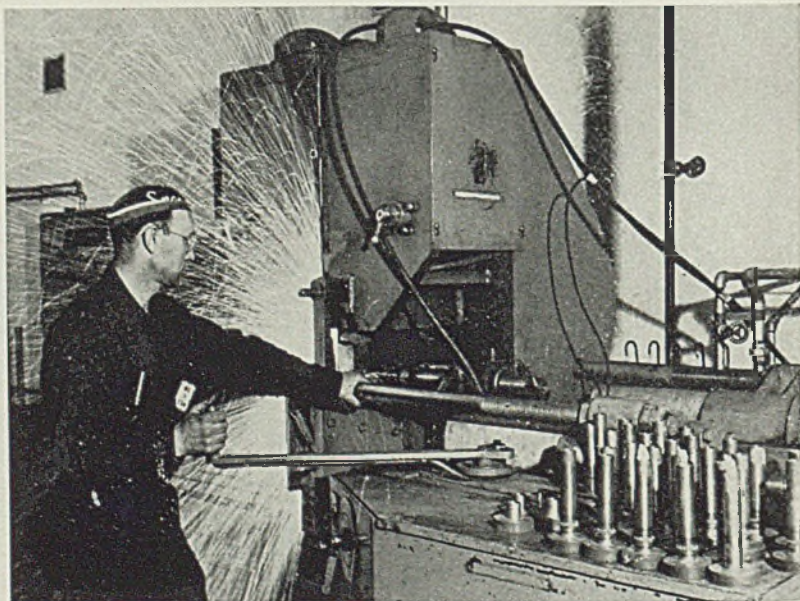
This much is known. Lockheed's gross sales for 1942, including wholly-owned subsidiaries, totaled just short of half billion dollars—\$491,160,470.87 to be exact. This represented a three-fold increase over 1941 and was eleven times that of 1940. Indicated net income after taxes and provision for the corporation's offer to reduce prices to the government under uncompleted renegotiation of certain contracts, was \$8,163,721.38, or \$7.59 per share. Reserves for contingencies and postwar adjustments of \$3,500,000 were set aside both in 1941 and in 1942, plus \$2,000,000 in 1942 for "possible obsolescence of inventories." As of December, 1942, all bank indebtedness had been liquidated, but since that time a \$90,000,000 V-loan has been

arranged with a group of banks.

Former Fleetwings Inc., Bristol, Pa., specialist in the production of stainless steel trainer planes, is now known as the Fleetwings Division of Kaiser Cargo Inc., following the purchase of the company by the Kaiser interests. Ira S. Wilson, vice president of Fleetwings, and active with the company since 1940, has been transferred to Brewster Aeronautical Corp., Long Island city, N. Y., to serve as vice president. The latter company also is operated now by Kaiser interests, reportedly having been taken over at the instigation of the Navy Department which was dissatisfied with production progress there. Frank de Ganahl is vice president and general manager of Fleetwings.

What looks to be an economical and efficient method for preventing the waste of good rivets—always a headache in an aircraft plant—has been put to test recently by Fleetwings. The plan is simple, centering around the packaging of rivets in small cellophane bags. Analysis shows a saving in dollars to the tune of four to one on heat-treated rivets and 10 to 1 on non-heat-treated rivets by the use of the bagging method.

About 2 ounces of rivets are put in each bag and the container then is indelibly marked, crimped and heat sealed. Riveters obtain their supplies from racks in which the bags have been placed according to size, type, etc. As needed,



FLASH WELDING: Forged steel caps are welded on tubes for piston assemblies at the Long Beach, Calif., plant of Douglas Aircraft Co. Inc. Welding machine uses 60,000 pounds hydraulic pressure on the piece at the upset. Special transformer supplies power, with current setting of 5.1 volts and 37,700 secondary amperes. Flashing time is about 9 seconds, with upset travel 3/16-inch, total travel 1/2-inch and closed dies 5/16-inch apart

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Speed Nut System

THE FASTEST THING IN FASTENINGS!

the rivets are removed from the bags and the open ends of the bag are twisted to seal them again.

Another important advantage is that heat-treated rivets do not harden as quickly when bagged. The cold air emanating from the bagged rivets keeps them soft much longer than in conventional practice. A further definite economy is possible by means of using an automatic bagging machine which measures a predetermined weight of rivets into each bag and seals them mechanically.

A typical test conducted by Fleetwings on non-heat-treated rivets, bagged versus unbagged, shows the following:

Unbagged rivets	Pounds
Weight of useful rivets in surfaces	48.5
Weight of rivets from sweepings	16.5
Weight of mixed rivets from benches	17.4
Total rivet demand during period of test	82.4
Weight of rivets lost through damage	0.75
Time to sort sweepings and bench collections	40.6 hours
Cost of screening	\$ 3.00
Cost of sorting	30.42
Cost of damaged rivets @ \$1 per pound	.75

Cost of reclamation and damages per pound of useful rivets	0.709
Bagged rivets	Pounds
Weight of rivets used	42.8
Weight of rivets returned	1.35
Weight of rivets to be sorted	0.094
Weight of useful rivets	41.45
Time required to bag and seal	1.8 hours
Cost of bagging and sealing	\$2.70
Cost of sorting bagged rivets	0.084
Cost of bagging and sorting per pound of useful rivets	0.0672

These tabulations show a margin of 10 to 1 in favor of the bagged rivets, considering only the relation between cost of reclamation and damages per pound used on the one hand and the cost of bagging and sorting per pound used on the other. Not included, but probably an important factor, is the relation between the bagged and unbagged rivets with respect to handling time.

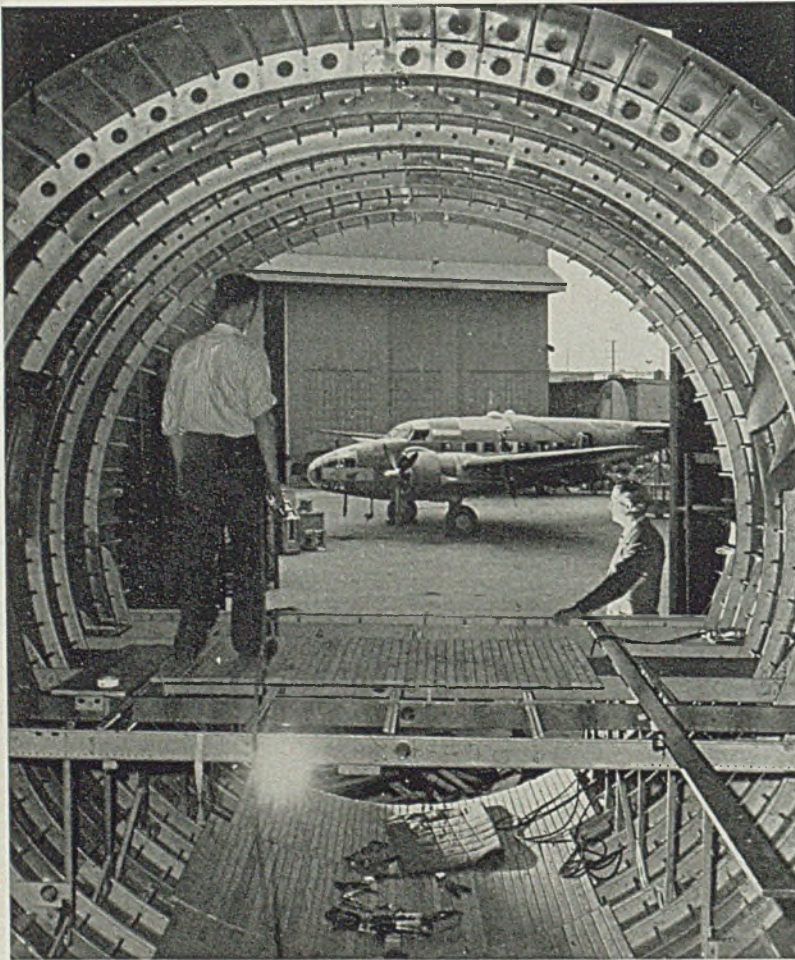
Comparison of Rockwell hardness and length of time before rivets reach non-driving hardness gives an edge to the bagged rivets of around 87 minutes.

New Aviation Company

One of the new aviation companies on the West Coast about which virtually nothing has been heard is Avion Inc., said to have been organized by Richard W. Millar, banker, who not so many years ago was brought into the presidency of Vultee by the Aviation Corp. and who left this post around the time the Consolidated-Vultee merger was first discussed. Millar has hired a number of top-notch aviation engineers from other companies in the southern California area and has set up operations in a Los Angeles plant. Just what he is doing few people on the Coast seem to know, beyond the fact that he and his staff are "developing a new plane."

AiResearch Mfg. Co. at El Segundo near Los Angeles, designer and builder of such accessories as exhaust heat exchangers, automatic exit flap controls, intercoolers, elliptical oil coolers and supercharger aftercooling systems, comes in for considerable comment in West Coast manufacturing circles because of the fact it has employed deaf mutes so successfully. It is reported 30 per cent of the company's personnel is of this incapacitated class.

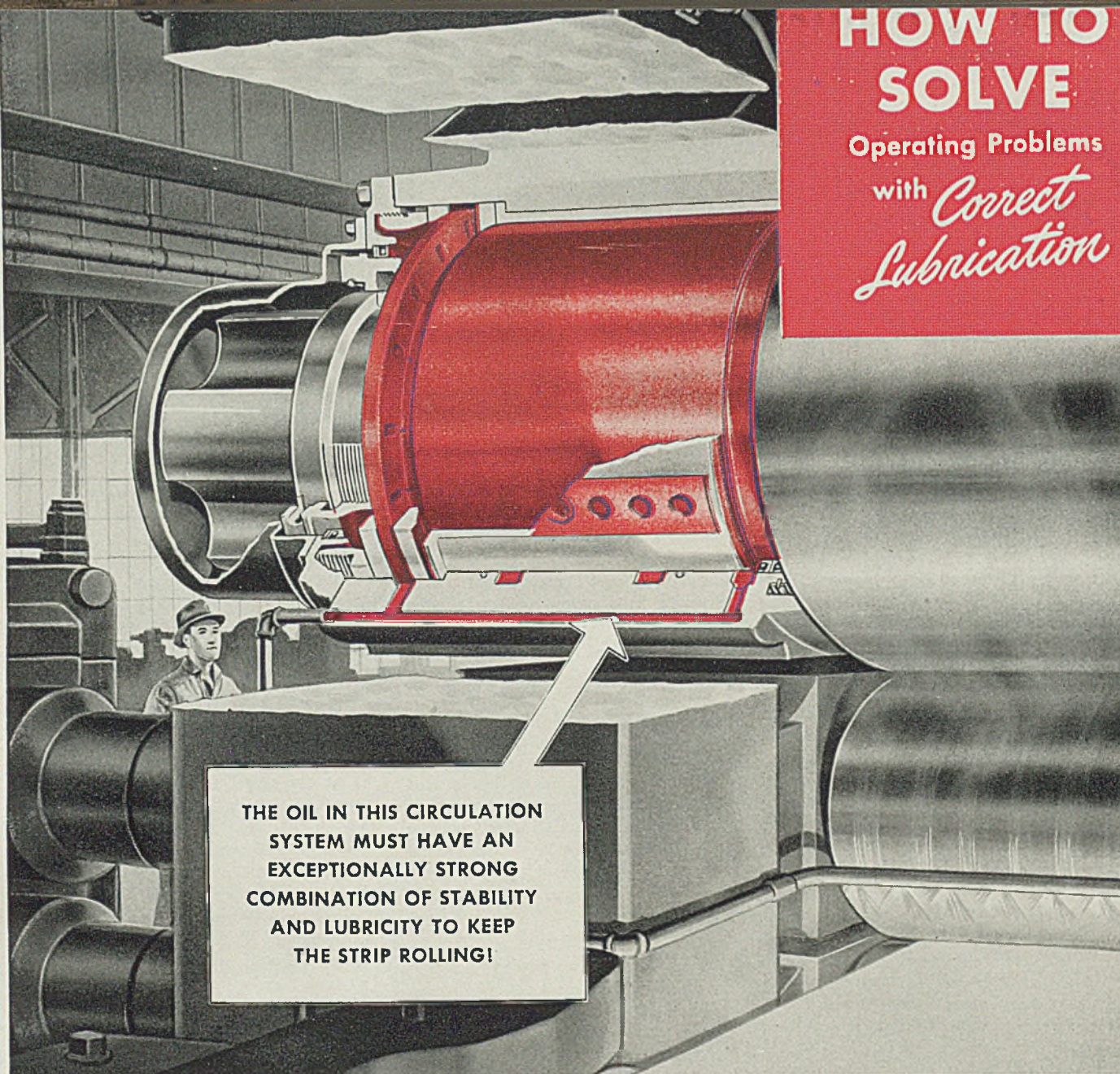
Some of the Lockheed-Vega "feeder" and small branch plants have had strange beginnings for plants now supplying aircraft assemblies and parts. One was formerly an ice rink, a second a bowling alley, a third a national guard hall, a fourth a flour mill, a fifth an automobile distributor headquarters, and a sixth a whisky distillery.



FAREWELL TO "OLD BOOMERANG": Through an unfinished fuselage section of the giant Lockheed Constellation, four-engine transport now going into volume production at Burbank, Calif., is seen the last of the famous Lockheed Hudson two-engine bombers to be built. Richard A. Von Hake, Lockheed vice president in charge of manufacturing (right), looks on as the final "Old Boomerang" rolls by, marking the end of an era in American aviation. The Hudson's role as a medium attack and reconnaissance bomber has been taken over by newer and faster aircraft, and the manufacturing and assembly space released is being turned over to the building of the Constellation, and to doubling production of the Lockheed P-38 two-engine fighter. The Hudson was in production steadily from January, 1939, to June, 1943, and hundreds of them are now in battle service on all six continents of the world

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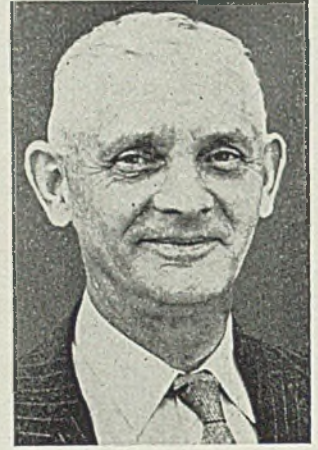
P. M. FLEMING



WALLACE W. LEIPNER



R. K. BOWDEN



DAVE M. WHYTE

P. M. Fleming, vice president in charge of sales, Pittsburgh Rolls Division, Blaw-Knox Co., Pittsburgh, has been given the added responsibility of vice president in charge of operations. Ralph H. Scholl, former sales engineer, has been appointed sales manager; S. Clifford Elms, previously chief engineer, has been named general superintendent; and W. H. White, formerly general superintendent, has been appointed metallurgical engineer in charge of research and new developments.

Lieut. Col. G. G. Blackstock recently was elected executive vice president of Steep Rock Iron Mines Ltd., Toronto, Ont.

J. W. Peckham has been appointed manager of the development and design engineering department, Bristol Co., Waterbury, Conn. Mr. Peckham joined the Bristol radio engineering department in 1922, and in 1940 he was made Pacific Coast district manager. E. Nuber



RUSSELL B. GUNIA

Who has been appointed manager, stainless steel bureau, metallurgical division, Carnegie-Illinois Steel Corp., Pittsburgh, as reported in STEEL, July 12, p. 86.

succeeds Mr. Peckham as manager of the Pacific Coast branch offices and factory with headquarters in San Francisco.

Wallace W. Leipner has been appointed acting chief engineer, American Welding & Mfg. Co., Warren, O. Mr. Leipner has been associated with the company since 1941 as assistant to the vice president in charge of engineering. He is a member of the National Society of Professional Engineers and also of the American Society of Military Engineers. Verne Wildman, previously general foreman of American Welding's machining department, has been appointed assistant superintendent.

W. K. Page has resigned as vice president and general manager of Addressograph-Multigraph Corp., Cleveland, to become associated with the Wassell Organization of Westport, Conn.

In the July 12 issue, captions labeling the pictures of J. L. Mullin and W. F. Kelly of American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill., were inadvertently misplaced. The photograph presented as that of Mr. Kelly was that of Mr. Mullin, and vice versa.

E. A. Koether has been named technical assistant to Allen W. Morton, vice president and general manager, American Hammered Piston Ring Division, Koppers Co., Baltimore. Edgar S. Freeman Jr., former assistant sales manager, succeeds Mr. Koether as works manager of the division.

Henry H. Howard, previously manager, engine sales department, Caterpillar Tractor Co., Peoria, Ill., has returned to the company as general sales manager after temporary emergency service with the United States Ordnance Department,

Detroit. J. Q. McDonald, acting general sales manager since May, 1942, is now free to devote full time to his duties as export manager of the company. H. W. Smith, former assistant manager, engine sales department, has been made manager of that department.

R. K. Bowden, former manager of the Chicago district metallurgical department, Carnegie-Illinois Steel Corp., Pittsburgh, has been appointed director of the quality control, research and technology department, Pittsburgh. L. J. Rohl, assistant manager of the metallurgical department in the Chicago district since 1939, succeeds Mr. Bowden as manager. F. A. Wickerham has been appointed staff assistant, department of research and technology, Pittsburgh. Howard J. Eyman has been named assistant to the company's chief metallurgical engineer, succeeding Mr. Wickerham. Howard L. Dawson, previously chief engineer, Pittsburgh district, has been appointed assistant chief engineer of the company to succeed the late L. C. Edgar. Charles H. Williams, former assistant to vice president in charge of engineering, United States Steel Corp. of Delaware, Pittsburgh, has been named to succeed Mr. Dawson as chief engineer of the Pittsburgh district.

Dave M. Whyte, foundry expert, Cooper-Bessemer Corp., has been appointed supervisor in charge of casting sales for the corporation's two foundries located at Mt. Vernon, O., and Grove City, Pa.

Albert S. Glossbrenner, former superintendent, Brier Hill Works, Youngstown Sheet & Tube Co., Youngstown, O., has been appointed general superintendent of the Youngstown district, succeeding J. L. Mauthe, who has become vice president in charge of operations, as announced in STEEL, July 5, Buford M.



E. S. MOORHEAD



WILLIAM J. McMILLEN

Stubblefield, formerly superintendent of the coke plant and blast furnaces at the Campbell works in Youngstown, succeeds Mr. Glossbrenner as superintendent of the Brier Hill works.

E. S. Moorhead, organizer and director of the steel tubing division, Iron and Steel Branch, War Production Board, has resigned to become general manager of the Steel Tube Division, Talon Inc., Oil City, Pa.

S. H. Mortensen, chief engineer of the electrical department, Allis-Chalmers Mfg. Co., Milwaukee, has been elected

a national director of the American Institute of Electrical Engineers for a term of four years beginning Aug. 1.

William J. McMillen, since 1939 assistant manager of roll sales, Mackintosh-Hemphill Co., Pittsburgh, has been appointed manager of production and manufacturing. Mr. McMillen has been associated with the company 26 years.

Fred T. Whiting, manager of Westinghouse Electric & Mfg. Co.'s Northwestern district, and Charles L. Dostal, Pacific Coast district manager, have been appointed vice presidents. Mr. Whiting's

headquarters are in Chicago, Mr. Dostal's in San Francisco. Roy V. Gavert, former manager of the Canton Ordnance division for Westinghouse, has been appointed headquarters staff superintendent of the district manufacturing and repair department, East Pittsburgh, Pa.

John W. Thompson, for the past four years Cleveland district representative, Carpenter Steel Co., Reading, Pa., has been appointed assistant manager of alloy steels sales with headquarters in Reading.

Marcello A. King has joined Worthington Pump & Machinery Corp., Moore Steam Turbine Division, Wellsville, N. Y., as executive engineer, taking charge of design, research, testing, and service.

Richard H. Hughes has joined Almqvist Brothers & Viets, Los Angeles, as manager of the abrasive division.

Frank H. Buckingham has been named president of the Sandusky Foundry & Machine Co., Sandusky, O., succeeding Devereux Lake, resigned.

Fred W. Fraley has been appointed vice president and sales director, Diamond Alkali Co., Pittsburgh.

OBITUARIES . . .

Edward F. Kenney, 74, metallurgical engineer on the staff of the vice president of operations, Bethlehem Steel Co., Bethlehem, Pa., died July 8 in Media, Pa. Mr. Kenney was widely known throughout the steel industry, with which he had been associated since 1907. He was past president of the American Steel Manufacturers Association, which was later absorbed by the American Iron and Steel Institute, and was a senior member of several committees of the American Society for Testing Materials. Mr. Kenney had also served as a member of the Technical Advisory Committee, WPB.

Samuel Reid Russell, 63, senior technician, explosive department, E. I. du Pont de Nemours & Co., Wilmington, Del., died in Easton, Pa., July 8.

Gustave F. Williams, president, Williams Mfg. Co., Cleveland, died July 3 in Columbus, O.

Erwin H. Geiger, 47, president, Surrey Motors Corp., Long Island city, N. Y., died July 7 in that city. Formerly

president of General Bronze Corp., Long Island city, N. Y., Mr. Geiger left that company in 1936 to devote full time to Surrey Motors.

Charles H. Wilkinson, 61, president, Logansport Machine Co., Logansport, Ind., died July 13 in Cleveland.



JAMES E. MacMURRAY

Who was founder and president for 38 years of Acme Steel Co., Chicago, died July 1 in South Pasadena, Calif., as announced in STEEL, July 12, p. 87.

John Henry Dumbelton, 52, technical adviser and purchasing agent for the maritime division, A. B. C. Steel Equipment Co. Inc., New York, died July 4.

Forrest A. Kelly, construction production co-ordinator, Republic Steel Corp., Cleveland, died June 26.

H. William Peyser, 31, manager, sales-correspondence department, Carbide & Carbon Chemicals Corp., New York, died July 3 in Brooklyn, N. Y.

C. J. Qualter, general manager, gear department, Meisel Press Mfg. Co., Boston, died recently.

Forrest Gains Hamrick, 63, comptroller, American Smelting & Refining Co., New York, died July 9 in Ridgewood, N. J.

Henry J. Mollenberg, 75, president, Mollenberg-Betz Machine Co., Buffalo, died July 11 in that city.

Hugo C. Wagner, 70, department manager, Simmons Co., Kenosha, Wis., died July 4 in Evanston, Ill.

Possibilities for the Future Limitless, Industrialist Holds

Chairman of Monsanto Chemical Co. in new book maintains present visions are but the promises of great adventures which lure modern pioneers. . . Says private enterprise more likely to further progress than collectivism

THAT the possibilities of the future are so limitless only one forecast can be made with certainty—that the most extravagant prophecy will fall short of potential accomplishments, is the hope which Edgar M. Queeny, chairman Monsanto Chemical Co. St. Louis, holds forth for the postwar world in a book, "The Spirit of Enterprise," just released by Scribner's Sons, New York.

Denying that our economy has reached maturity and that our chief problem is to learn to live with our new and unmanageable riches, Mr. Queeny maintains "we are rich in material things only by comparison with other nations and with the past."

The day may come, he predicts when workers will travel a hundred miles from country homes to offices and factories by helicopter bus with no greater expenditure of time and money than is required for a bus-ride through five miles of city traffic today.

"Business believes that pre-fabricated houses of the future will be warmed by sunlike, healthful, penetrating radiant heat from tiny wires buried within walls. They will be air-conditioned for summer comfort, illuminated by cool, germicidal light, and equipped with built-in, low-temperature refrigeration to keep food fresh for months, even years."

"But these and many hundred other visions," he points out, "are but promises of great adventure which lure modern pioneers. That we have reached maturity is a conclusion of pessimism."

It is Mr. Queeny's conclusion that the people, expressing their desires in the market place, are much more likely to stimulate further progress toward the material and spiritual gains he deems possible than any state-planned, state-controlled production system.

While he votes unhesitatingly for free enterprise as opposed to a state planned and directed economy, and while he marshals an imposing array of historical and contemporary data to support his choice, he does not find business faultless.

"Business men," he says, "should be willing to accept more of the classic conception of the free enterprise system. Business should recognize the justice of

much well-deserved, although misdirected, criticism by new dealers. Business men should correct the causes of the antipathy to their ways that has arisen in such profound and superb intellects as that of the archbishop of Canterbury. They should be willing to have all conditions necessary to a free market restored, and to provide the people with the full advantage of competition.

National Incorporation Law

Among the specific suggestions Mr. Queeny offers for the immediate future are a national incorporation law which would strengthen existing antitrust laws by prohibiting interlocking directorates, mergers between competitors and the ownership of stock by one business in another. Business, he suggests, must also give up "the special privileges it now enjoys in the way of excessive tariffs against nations with an equivalent standard of living and be reconciled to a reduction of those against low standard nations as fast as it can be accomplished without disrupting our economy."

To be effective, however, he points out that these progressive moves by business must be matched by an equally en-

lightened attitude on the part of government. By applying Hatch act principles to pressure groups, he suggests that Congress might destroy the disproportionately swollen power of vociferous minorities. By substituting regulatory laws for government of business by capricious and unpredictable boards and commissions, Congress could free business from crippling uncertainty at the same time it continued to protect the people from business excesses.

As another necessary measure, he suggests that taxes should be reconsidered on the basis of what kind and what rates will produce over the long pull the greatest potential revenue needed for normal operating expenses of government and liquidation of the national debt, thus forestalling the inflationary threat of continued deficit financing and freeing capital markets for the tremendous job of reconstruction and new industrial expansion which lies ahead.

He warns it is not necessary to socialize our economy through central economic planning in order to provide adequately for the so-called lower third. On the contrary, by encouraging free enterprise, we encourage the technological progress which brought us to our present peak and which promises even greater gains for the future. By absorbing a part, or even all, of the savings of technological progress through a progressively-increasing manufacturer's excise tax, we could finance a much more ambitious and extensive social program than any redistribution of our present wealth, and we could do this without raising average prices to the public or reducing incentives to capital, labor or management.

Nation Needs More Employers!

Economist declares their birth and survival rate should be made higher in treatise on postwar readjustments in which question is raised whether labor has not overpriced itself in terms of full employment

EXPERIENCE during the 20's and 30's indicate that there must be some wage for labor at which greater quantities of it can be absorbed into productive employment than at any other, states Dr. Emerson P. Schmidt, economist of the Committee on Economic Policy, Chamber of Commerce of the United States, in another notable pamphlet, No. 5 in the series entitled "Postwar Readjustments."

In the pamphlet Dr. Schmidt discusses problems that will be involved in the postwar absorption of our total labor supply, and in it he raises the question as

to whether labor has not overpriced itself in terms of full employment.

Figures for the 30's, he says, are particularly significant. Figuring 1929 on a basis of 100, both wholesale and retail prices had dropped to 81 by 1939; at the same time hourly wage rates had risen to 122. The popular assumption that high hourly wages mean greater purchasing power fails to take into consideration that high hourly wages also mean higher production costs.

Higher production costs forced manufacturers all through the 30's to seek ways and means of increasing productivity per

worker in order to be able to sell its goods or services at prices that met competition and which consumers would pay. The continual demand of labor for higher pay thus was a leading factor in bringing about more unemployment.

Just as a good example, Dr. Schmidt includes figures showing that for every 100 people employed by the railroads in 1923 only 55 were on railroad payrolls in 1940. While the railroads have had a good record in the field of labor relations, as Dr. Schmidt points out, relative freedom from strikes has been purchased at the price of many jobs of railroad men.

On the other hand, Dr. Schmidt states, more thought should be given to "real" rather than hourly wages. In 1908 rubber workers were being paid an average of 40 cents an hour on tires costing \$35 that would run an average of 2000 miles; he shows that an hour's pay to the rubber worker would have enabled him to drive a car six miles, counting only the factor of tire wear. In 1936 the rubber worker received 88 cents an hour, a gain of 120 per cent. However, a number of other things had happened. The tire cost \$8, it could run 20,000 miles. The wage of a rubber worker in 1936 was sufficient to drive his car 2200 miles as far as tires were concerned. Higher quality at lower prices, declared Dr. Schmidt, must always be far more important in the standard of living of the American people than the number of counters (dollars) they get.

In other words, by continually driving for higher wages labor may be killing the goose that lays the golden eggs, and if labor continues to ignore this fact it is going to eliminate the possibility of having full employment after the war.

Another threat is that continued demands for higher wage rates in those industries that are more profitable at any time, and in insisting upon bonuses and other financial benefits to the workers involved, will invite trouble.

It should be clearly understood, Dr. Schmidt states, that wage rates in any one industry should not depend upon productivity and profits in that particular industry. Rather, the increase in output should be shared by all consumers, which automatically would include all labor rather than some labor. In other words, we need a new concept of "collective bargaining" if we are to avoid vast unemployment at some time in the postwar period.

It is necessary that we re-learn the simplest definition on an employer: An employer is a person who provides employment. In the 30's when we had a dire shortage of employment offers and a surplus of would-be employes, we tried to correct the unbalance by making the position of the employe more attractive

and that of the employer less attractive.

"Then we wonder why there are not more employment opportunities! We need more employers. The way to get them is to make their birth and survival rate higher," says Dr. Schmidt.

While social gains may be desirable, and while no one wants to set the clock back, in our enthusiasm for reform and change we must exercise much greater care in the future than we have in the past.

"Instead of making it tougher for an employer to put and keep men on his payroll," concludes Dr. Schmidt, "we must make it easier and more attractive for him; otherwise all this talk about jobs for all is a species of self-deception or, at best, a gross deception of labor itself. No one has any right to trifle with the welfare of labor."

Copies of the pamphlet may be had by writing to the Chamber of Commerce of the United States, Washington.

REHABILITATION

Restoration of economic and political structures of war-torn countries of Europe and Pacific areas as they are removed from Axis domination to provide huge demand for labor and materials of all kinds

VAST amount of employment will be furnished in relieving and rehabilitating war-torn countries of Europe and in the Pacific area as they are removed from Axis domination, according to Herbert H. Lehman, director, Foreign Relief and Rehabilitation Operations, and former governor of New York, in recent speeches.

So gigantic is the problem that a draft agreement, already signed by China, the Soviet Union, the United Kingdom and the United States, has been placed by the Department of State before the 43 governments of all the United Nations and the other nations associated with us in this war. The principle is that of "equitable sharing." The needs are so large that no one nation, nor any limited number of nations, could supply them without draining off raw material supplies to an undue extent.

Initial needs in supplying relief will include such items as food, medicine, clothing and other essential supplies. Then must follow assistance needed for purposes of rehabilitation, seeds, fertilizer, farm animals and many other items. Railroads, bridges, highways, port facilities, telephone and telegraph lines must be repaired. Water supply and sanitation must be restored. Farm and factory equipment will have to be furnished. The morale of Axis controlled peoples must be re-established and they must be enabled to achieve and maintain a high degree of prosperity.

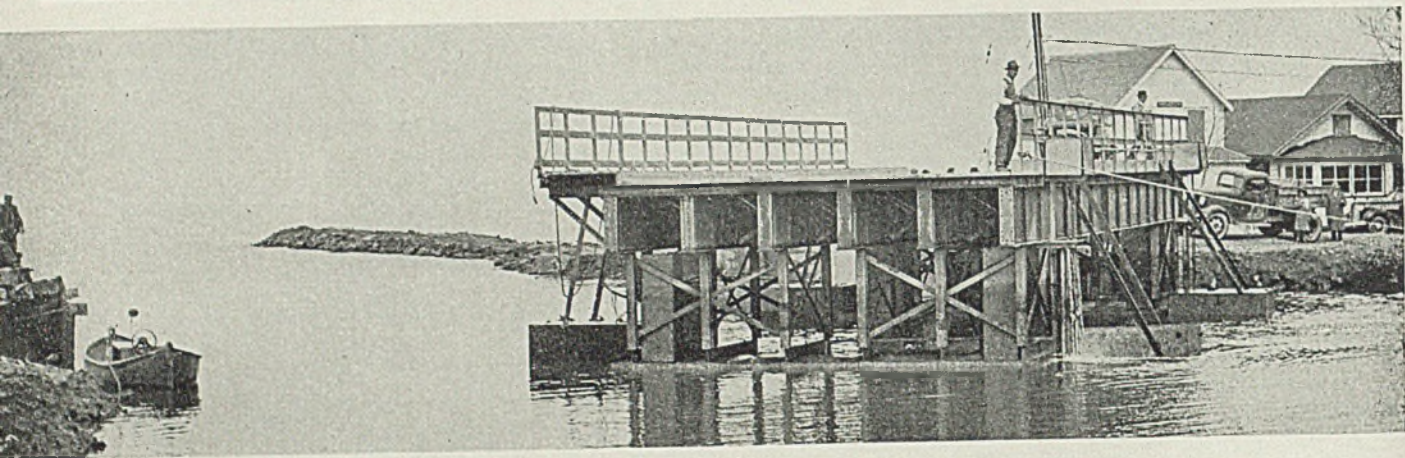
"Prosperity in this country helps other people to be prosperous and

prosperity elsewhere helps us to be prosperous," Governor Lehman says. "I would like to suggest that prosperity, like peace, is indivisible. After the war the peoples of this world will either go forward on the road to progress together or they will go to economic ruin together."

He quotes from Henry J. Kaiser, West Coast industrialist: "Let it be said again that there will never be any significant prosperity in America as long as there are great hosts of people living on the margins of prosperity anywhere on earth."

As the war approaches its climax, and in the immediate postwar era, says former Governor Lehman, machine tool builders, shipbuilders, and many other industries will be able to continue in existence and provide employment by producing one or another of the many items that will come under the general head of foreign relief and rehabilitation.

In other words, such relief and rehabilitation is impelled not only by considerations of decency and humanity, but it is good business. By rebuilding the foreign countries and creating better customers for many of the products in which, because of our inventive and productive genius, we are pre-eminent in the world, we will have less to worry about in connection with our own economy. Instead of playing "Santa Claus" as many critics have charged, expenditures that come under the head of foreign relief and rehabilitation will prove a profitable investment in the long run, he says.



Tow Bridge Solves Launching Problem

"WHACKY" PROPOSAL PRACTICAL

Unique span erected over dredged channel from inland shipyard permits passage of newly launched tankers with minimum interruption of highway traffic. . . Bridge is economical to operate and can be easily moved from anchorage

AMERICA'S war production ingenuity is no more in evidence than at the Odenbach Shipbuilding Co. yards in Greece, N. Y., a few miles outside of Rochester, where engineering achievements aren't restricted solely to novel techniques in turning out oil tankers for the Transportation Corps, Army Service Forces.

The mere fact that the shipways are operating is indicative of the ingenuity that is being translated into striking power through production. For the Odenbach yards were constructed inland on a farm site, about 1800 feet from Lake Ontario a year ago. Sufficient lakefront property was at a premium; couldn't be obtained, in fact. But the problem

of launching tankers was solved neatly and with dispatch.

The farm abutted Round pond, which extended near the shipways and some distance to the lake. Engineers dredged the pond and provided an exit route for the ships which are being launched today at the rate of one every 12 days. Yet still another problem presented itself. Edgemere drive carried across the newly dredged exit channel. This called for construction of a bridge—and a different type of bridge—one that could be put in place in a hurry; would be economical in cost and operation and easily moved

from its anchorage when necessary.

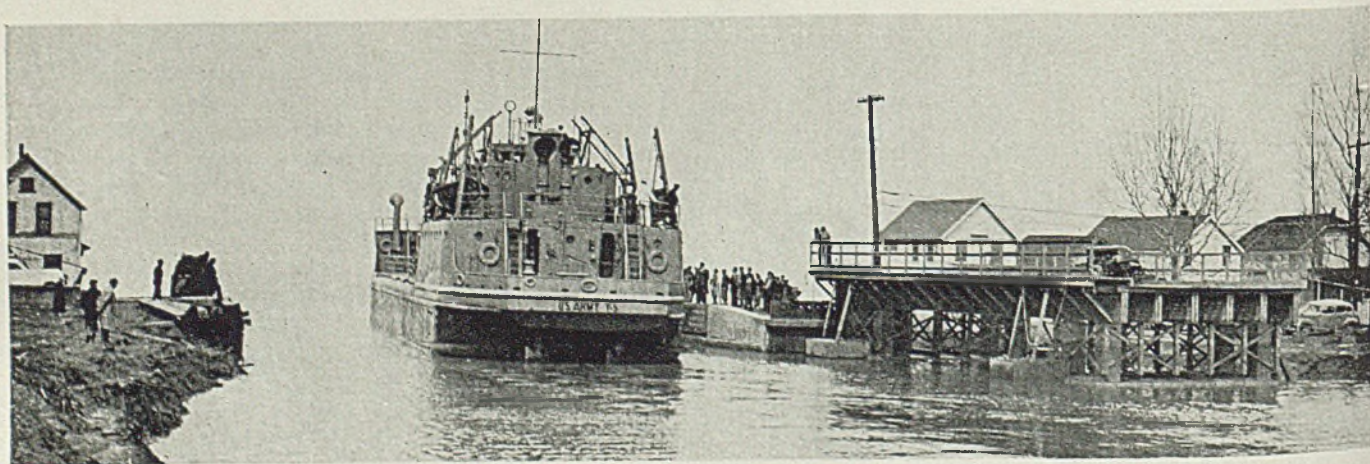
Odenbach engineers went into a huddle, conceived what seemed a "whacky" yet practical idea. Maybe it was crazy, they conceded, but they were from Missouri and had to be shown. So they called in "outside" advice.

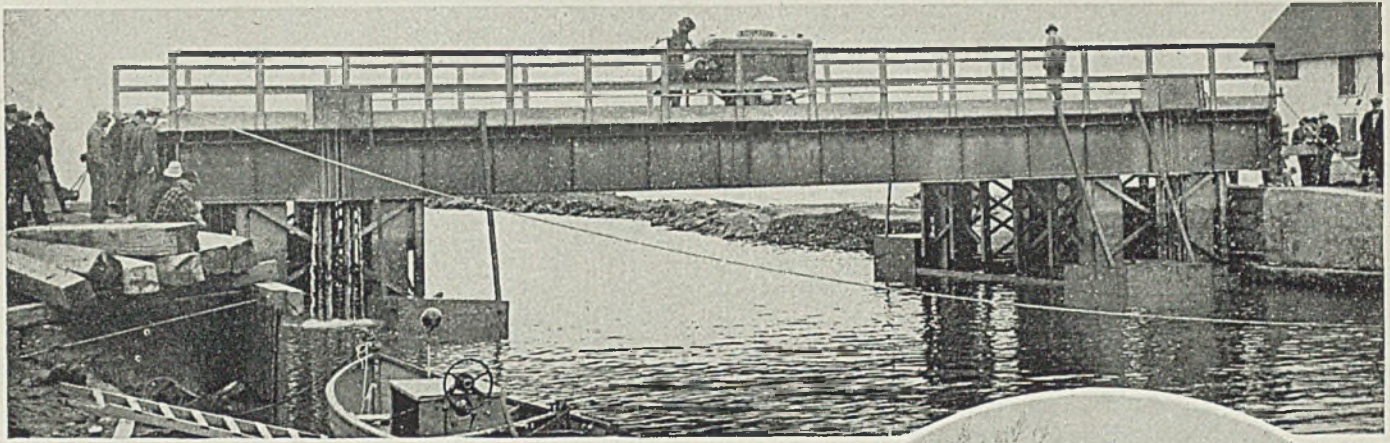
Engineers of the Irving Subway Grating Co. were consulted. "Not so crazy," was the comment from these experts. Odenbach and Irving engineers rolled up their sleeves and went to work.

What is described as one of America's most unusual bridges resulted!

It is a "pontoon tow" span, 65 feet long and 22 feet wide, with four lifting pontoons, one under each corner, and four outrigger pontoons for added stability. The bridge is surfaced with standard open-mesh steel decking $2\frac{1}{2}$ inches deep, which saves an estimated 50 tons in weight over corresponding

Just off the ways this Army tanker sails past "pontoon tow" bridge which has been towed aside by a crew of two men. Lightweight bridge is surfaced with open-mesh steel decking

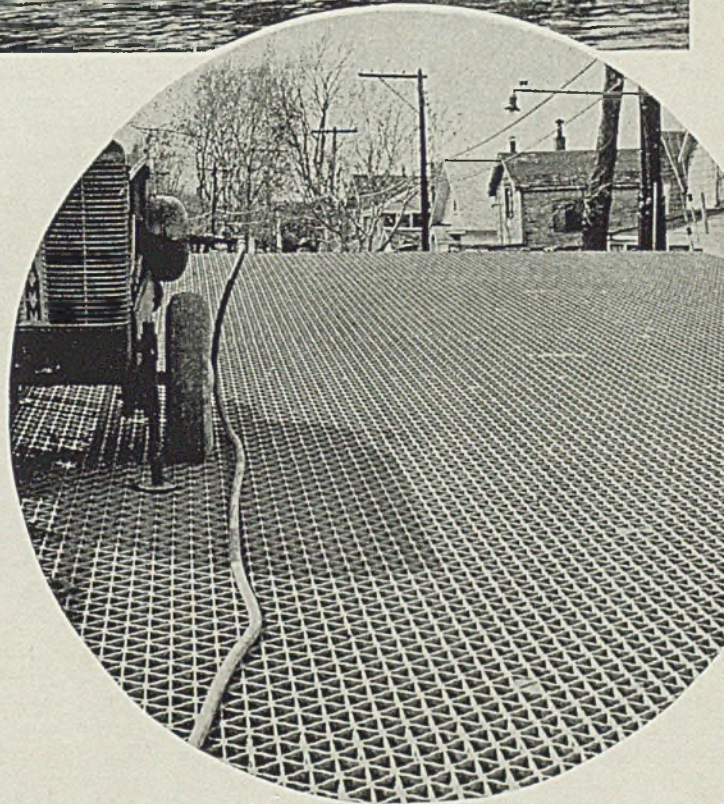




Left—Inland yard of Odenbach Shipbuilding Corp. necessitated dredging of a canal to Lake Ontario and construction of "pontoon" tow bridge. Span is shown being swung by guy ropes to allow passage of newly launched tankers

Above—"Pontoon tow" bridge is an open-deck steel span which can be swung easily aside to allow passage of tankers when they are launched from the inland ways. Here bridge is shown being raised and guy ropes are being attached to slip span from mooring

Right—Closeup of two-lane open-mesh steel surface "pontoon tow" bridge. Machine at left is portable air compressor which pumps air into four lifting pontoons and raises span above roadway level



concrete surfacing. Total weight of the span is 75 tons, with 15-ton capacity and two-way continuous traffic.

Lifting pontoons are each 25 feet by 10 feet by 6 feet deep, with the outriggers 5 feet by 6 feet by 7 feet. The bridge, which is about 200 feet back from the lakefront, rests on a continuous concrete sill. When a boat is ready for its shake-down run on Lake Ontario, it is towed down the channel to the pontoon bridge. Here a portable air compressor mounted on a truck pumps pressured air into the lift pontoons, which empty out the water. The span then raises several feet above a roadway level and is ready for the tow-lines.

The bridge is then swung by a team of two men from the roadway about 50 feet and sidled into a specially-dredged bay. Before this bridge "hangar" was hacked out of the channel, the floating span was towed out into Lake Ontario while newly launched tankers made their proud exit down the channel. Now, however, the entire procedure is expedited by simply swinging the bridge aside. Entire process of inflating the pontoons with compressed air and slip-

ping the bridge from anchorage consumes 20 minutes or less.

Odenbach engineers say the bridge is a complete success and offers a practical answer for any problem of the kind where mobility is required only occasionally and where economy and construction speed are prime considerations.

The span utilizes a 90 cubic-foot portable compressor. Lifting capacity is approximately 120 tons.

Credited With "Firsts"

The Odenbach company is credited with many notable "firsts." Most recently, it won praise for its technique of using channel irons for hull construction, rather than conventional steel plates. This allows for 90 per cent prefabrication before going down the ways. In addition, the tankers are 80 per cent welded. Boats are built in 6 sections—3 cargo tank sections, bow section,

engine room section and after-peak section. Workers put through the complete hull in only 11 working days.

Before the war, the Odenbach company built large tankers with three million gallons average capacity. Now, however, the yard is concentrating on medium-sized tankers, 180 feet long, with a 30-foot beam and a 13-foot molded depth. Two diesel engines propel the twin-screw craft which are designed for ocean travel. They can carry 288,000 gallons of gasoline.

Guiding genius of the shipyard is John H. Odenbach, of Rochester, who invented the steel channel system of construction, which is under study for possible use in other Army yards.

In 1931, when Mr. Odenbach entered the shipbuilding business, his yards turned out the largest all-welded ship of any kind—a combination tanker and freighter 212 feet long with a 30-foot beam.

Coal Conference Stresses Output

Mine operators, equipment men, government officials meet to study means of restoring peak production

REMOVAL of all obstacles standing in the way of maximum production of coal for war and intensified co-operation within the industry during a most crucial period in its history are favored topics as members of the American Mining Congress meet July 19 at the Netherland Plaza, Cincinnati, for a two-day coal mine war conference.

In order that the meeting of mining executives, government officials and equipment manufacturers might be confined strictly to discussions of industry-wide difficulties, exhibits were ruled out.

The conference program highlights the manpower problem by giving it first place in the opening sessions on Monday.

Technological advances, improvement in mining, handling and preparation technique and conservation of men and materials were to be covered by speakers addressing the four deep and strip mining sessions.

A special meeting was arranged for Tuesday morning to give coal company purchasing agents and their staffs the chance to discuss buying problems and procedures with A. S. Knoizen, director, War Production Board Mining Equipment Division. An open meeting was to be held Tuesday afternoon for mining equipment manufacturers to gain a better understanding of allotments, equipment scheduling and other matters pertaining to their field from WPB officials.

George F. Campbell, vice president, Old Ben Coal Corp., national chairman of the congress, is general chairman of the meeting and leader of the opening session. R. L. Ireland, Jr., president, Hanna Coal Co., Cleveland, will preside at the luncheon meeting on Monday which will feature a talk on the military situation. Practical topics bearing more directly on problems of the coal industry were to be discussed by speakers addressing the luncheon session on Tuesday. The speakers and their subjects:

Howard I. Young, director, Mineral Resources Co-ordinating Division, War Production Board, on "Assisting the Mines To Maintain Full Production"; T. J. Thomas, director of production for coal mine operations, Department of the Interior, on "Coal for War"; Arthur S.

UTILITY BUILDING

New type of galvanized steel semicircular building, 40 feet wide by 100 feet long, is being built in great numbers in foreign theaters of war to be used for purposes ranging from recreation centers to machine and repair shops.

Exclusive of the time required for laying a concrete floor, the structure can be erected in about 300 manhours. The arched ribs are made of strip steel. Ribs are manufactured in sections and can be laid on the ground and bolted together. Construction crews are able to raise the ribs by merely pulling them into place with a rope.

The corrugated steel cover is camouflaged. Each unit weighs approximately 25,000 pounds and can be packed into crates occupying only 369 cubic feet of space.

Knoizen, director, Mining Equipment Division, WPB, on "Machinery and Equipment for Coal Mining." George E. Stringfellow, vice president, Thomas A. Edison, Inc., incoming chairman, manufacturers division, American Mining Congress, will preside.

Carl E. Newton, Deputy Federal Coal Mine Administrator, and Hon. James V. Forrestal, Undersecretary of the Navy, will be guest speakers at the annual dinner on Tuesday evening. Irvin Davis, president, Hatfield Campbell Creek Coal Co., was toastmaster.

New Officers Announced By Controllers Institute

W. H. Dupka, controller of the Jones & Laughlin Steel Corp., has been elected a vice president of the Pittsburgh Control of the Controllers Institute of America. J. H. Carson, controller and assistant treasurer of the Pittsburgh Coke & Iron Co., was elected secretary.

E. A. Berry, treasurer of the Koppers Co.; R. C. Markle, controller of the Carnegie-Illinois Steel Corp.; M. M. Schratz, auditor of the Aluminum Co. of America; R. E. Hanley, secretary and treasurer of the Allegheny Ludlum Steel Corp., and Rolf Griem, assistant controller of the A. M. Byers Co., were chosen directors.

James W. Flynn, assistant secretary and treasurer of the Sheffield Steel Corp., has been elected vice president of the Kansas City Control.

Walter H. Winter, assistant secretary and assistant treasurer of the Symington-

Gould Corp., was re-elected secretary of the Buffalo Control.

Maynard F. Carter of the Worcester Pressed Steel Co., Worcester, Mass., has been re-elected a director of the Boston Control.

C. V. Burns, assistant treasurer of the American Zinc, Lead & Smelting Co., was re-elected a director of the St. Louis Control.

Kenneth B. Coates, assistant treasurer of the Great Lakes Steel Corp., and Vernard D. Hanna, secretary-treasurer of the Wolverine Tube Co., have been re-elected directors of the Detroit Control.

Michael J. Caden, controller of the Rustless Iron & Steel Corp., has been elected a director of the Baltimore Control.

James H. Barrett, secretary-treasurer of the Murray Corp. of America, Detroit; Richard L. Brummage, controller of the Tubular Alloy Steel Corp., Gary, Ind.; Phillip Donham, secretary and treasurer of the Electro Refractories & Alloys Corp.; Stanley E. Lebrocq, controller of the Steel Co. of Canada, Ltd., Hamilton, Ont.; John H. Nagle, assistant treasurer of the Muehlhausen Spring Corp., Logansport, Ind., and French Peterson, controller of the Kelly O'Leary Steel Works, Chicago, have been elected to membership in the institute.

Plans Being Prepared for Annual Chemical Meeting

"Catalysis of War Chemistry" will be the central theme of hundreds of papers and addresses to be presented before the 106th meeting of the American Chemical Society in Pittsburgh, Sept. 6 to 10.

Advances in wartime research will be reported at scientific sessions. "Manpower" will be the subject of a three-day symposium at which industrial leaders will discuss measures to overcome shortages of trained scientific workers.

CONVENTION CALENDAR

American Chemical Society, annual meeting. Minneapolis, Sept. 6-10. Dr. Charles L. Parsons, secretary, 1155-16th street N.W., Washington.

Association of Iron and Steel Engineers, semiannual meeting, three to four days starting Sept. 28, Hotel William Penn, Pittsburgh.

Electrochemical Society Inc., annual convention, New York, Oct. 13-14-15 and 16. Secretary, Dr. Colin G. Fink, Columbia University, New York.

American Institute of Mechanical Engineers, regional meeting; Iron and Steel Institute of Metals Divisions, A.I.M.E. Hotel Sherman, Chicago, Oct. 16-19.

American Society for Metals, twenty-fifth national metal congress, Palmer House, Chicago, Oct. 18-22.

American Welding Society, twenty-fourth annual meeting, Oct. 18-21, Hotel Morrison, Chicago.

Work Progressing on Two Stacks Under Construction in Texas

Lone Star state to resume her place among pig iron producing states after lapse of many years when new furnaces at Houston and Daingerfield are blown in some time during fourth quarter

CONSTRUCTION of the two Texas blast furnaces—the 274,000-ton stack of the Sheffield Steel Corp. at Houston, and the 432,000-ton unit of the Lone Star Steel Corp. at Daingerfield—is going forward and both are slated to go into operation during the fourth quarter.

Thus Texas again will take her place, after a lapse of many years, among the pig iron producing states of the union. Product of the Houston stack will be charged into the Sheffield Steel Corp.'s open-hearth furnaces, to be rolled subsequently in this company's finishing mills.

Pig iron to be made at Daingerfield will be available to other consumers.

The Lone Star Steel Corp. contemplates an open hearth and rolling mill program but such construction has not been authorized by the War Production Board.

At Daingerfield iron ore from the so-called North Basin, in Cass, Marion, Morris and Upshur counties, will be used exclusively. The ore occurs in green sand beds under an overburden of loose sand and soil approximately four feet deep, so that open pit mining methods may be employed.

The ore comprises an oxidized layer of limonite which averages 12 feet in depth. Underlying it, starting close to

the water level, is a layer of siderite of varying depth. A sufficient quantity of this ore to last the Daingerfield stack for many years is located a few miles from the plant site.

To use the ore an elaborate system of beneficiation must be employed, including crushing, washing and concentration. The ores are high in silica and alumina. Each type requires individual treatment. In the case of siderite carbonic acid will have to be driven off by roasting. Both classes will be roasted or calcined and the fines of both will be sintered. Flow-sheets for the preparation of these ores have been completed as a result of research, excepting that further details will have to be worked out to utilize the high silica middlings and thus permit higher recovery and bring down overall costs. The calcined limonite ore will average 51 per cent iron content, while the calcined siderite will average around 56 per cent. Silica will run around 11 per cent and phosphorus 0.08 per cent.

Ores from Cass County

At Houston the Sheffield Steel Corp. plans to use iron ore from Cass county in the North Basin and from Cherokee county in the so-called South Basin. In the South Basin the ore is a layer of limonite about 2½ feet deep and having little or no overburden. As far as now

is known there is no siderite in commercial quantities.

The problem of beneficiation in the case of the ore going to Houston is not quite as difficult as will be necessary at Daingerfield.

Sheffield Steel Corp. does not at present contemplate the use of siderite. The limonite ore is to be crushed and washed. Calcining is not contemplated. With a mixture of ores from the North and South basins, the burden for the Houston furnace, on a 50-50 basis, will contain 45 to 46 per cent iron, 11 per cent silica and about 0.2 per cent phosphorus. A rail haul ranging from around 50 to some 200 miles is involved in getting the ore to the Houston site.

While the final cost of the ore delivered to the furnaces is not known exactly, the indications are that the unit cost of the contained iron will be lower than that in the case of lake ore delivered to Pittsburgh district furnaces.

The Sheffield management also contemplates the use of Mexican magnetite containing 63 per cent iron, 3 per cent silica and 0.60 per cent phosphorus. While it would bring up the phosphorus content it would reduce the silica in the charge. This ore would be hauled some 1000 miles from the Cerro de Mercado, the famous "iron mountain" in the state of Durango. Continuous delivery of this ore may not be possible during the war period because of car shortages.

Both the Daingerfield and Houston plants are equipped with batteries of by-product coke ovens. They will operate on coal of metallurgical quality from three mines in the state of Oklahoma which are scheduled to deliver a total of 2800 tons of coal daily to the two plants.

They Say:

"Certainly this Congress is no rubber-stamp Congress. Co-operating with the President on every war question, Congress has differed with him on almost every domestic policy."—**Senator Taft** of Ohio, addressing Alabama Bar Association.

"The spirit of co-operation and unity in industrial America accounts in large measure for the tremendous advances in production. We have all worked together; we have sacrificed together; we have resolved differences around the council table and the ration boards in behalf of an all-out effort. And we have not held back or delayed in constructive action."—**John R. Steelman**, director, United States Conciliation Service.

"Through some lack of foresight or vision manufacturers have permitted the public to get conceptions of postwar products which are impossible of attainment in the im-

mediate postwar period."—**Lawrence Valenstein**, president, Grey Advertising Agency, New York.

"It is probable that immediately following peace and possibly even before then there will come from the railroads of the country a demand, so insistent that compliance with it will be imperative, for new equipment by way of rolling stock to replace that destroyed or worn out by reason of the heavy continuous service given by the roads during these years of national emergency."—**Charles J. Hardy**, president, American Car & Foundry Co.

"Through efforts on the home front, together with those on the battlefield, we have the enemy staggering. But like a winning prize fighter, we shouldn't give the enemy a breather, but continue our onslaught until he is completely out."—**Dr. William P. Edmunds**, Cleveland area director, War Manpower Commission.

Rolling Process Conserves Steel

American Rolling Mill develops new method of rolling propeller blade steel; saves critical metal

METHOD of rolling airplane propeller blade steel so that two blades may be made from the same amount of critical material that previously made one was revealed recently at the annual shareholders' meeting of the American Rolling Mill Co., Middletown, O.

Charles R. Hook, president of the firm, described the rolling process developed by the company. The process saves large quantities of critical materials and reduces machining time of the finished propeller by more than half, it was said.

Achievements of the steel industry, which has increased ingot capacity by 15,000,000 tons since 1940 and currently is producing at the rate of 90,000,000 tons in 1943, were cited. This has been done, Mr. Hook said, in the face of serious raw material handicaps and widespread labor disturbances throughout the industry.

Stockholders were told that the recent stoppage in the nation's coal mines, which impaired steelmaking facilities generally, had not interrupted production in the company's plants because an ample stock of coal was on hand.

James B. Doan, J. Frank Drake, R. L. Gray, and Charles R. Hook were re-elected directors for a three year term.

NAM Issues Booklet With 70 Morale Posters

National Association of Manufacturers recently issued to its 9000 members a "Posters-For-Production" booklet containing reproductions of 70 morale-building posters chosen as representative of the war effort.

Posters were chosen from approximately 1000 submitted by 700 companies and were judged by three non-members of the association.

Interlake Chemical Corp. Formed in Delaware

Interlake Chemical Corp., a new company to be owned jointly by Interlake Iron Corp., Chicago, and Great Lakes Steel Corp., Detroit, has been incorporated in Delaware with authorized capital of \$5,000,000.

The chemical corporation was organized for the purpose of processing chemicals recovered from distillation of coal

in by-product coke ovens. The Interlake Iron Corp.'s Chicago tar distillation plant, which has been in operation for the past three years and its tar acid and naphthalene plant now under construction in Chicago, have been sold to the new corporation.

Officers of the Interlake Chemical Corp. are George R. Fink, chairman of the board; Leigh Willard, president; Earl Doig and J. A. Mitchell, vice presidents, and J. R. Alderman, secretary and treasurer. Directors are Mr. Fink, George Humphrey, Mr. Doig, Severance A. Millikin, Mr. Mitchell, and Mr. Willard.

Develops New System To Feed Workers on Job

A new system for feeding war workers on the job, thus avoiding congestion in cafeterias, has been developed by Mealpack Inc., New York city.

Hot and cold foods, packed side by

OFF TO WAR

More than 7200 employes of the Birmingham district plants, mines and mills of the United States Steel Corp. subsidiary companies are serving in the armed forces, according to officials of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Of the 7200 serving on land and sea, more than 7000 are from Bessemer, Ensley and Fairfield operations, and from various mines, quarries and office staff of the Tennessee company. Virginia Bridge Co.'s Birmingham plant has relinquished 135 employes to the armed forces and Universal Atlas Cement Co.'s Leeds plant lost 22 to the services.

side to form a complete meal, can now be served up to five hours after packing in the container produced by the company. The container consists of five earthenware food and beverage compartments insulated within durable finished pressed steel.

A menu for pre-ordering the following day's meal is enclosed and the entire container sealed for delivery to the workers on the job. A seal-lock prevents tampering with the containers and also carries the worker's shop number to permit easy identification.

When unsealed the top lid of the container becomes a comfortable tray. Distribution methods from the kitchen to the worker vary with the size and nature of the operations. Time lost getting to and from the food lines in cafeterias and

lunch rooms is saved by delivering the food directly to workers.

For the duration the containers are available only for use in essential war plants.

BRIEFS . . .

Cooper-Bessemer Corp., Mt. Vernon, O., has extended its line of marine engines and is now producing diesels for propulsion and auxiliary power in salvage vessels of the United States and British navies.

Jessop Steel Co., Washington, Pa., announces organization of a new technical sales staff composed of the following specialists: John R. Harbaugh, metallurgical sales engineer; H. E. Doughty, assistant general sales manager; R. P. J. McCarty, eastern stainless steel representative; W. E. Wilson, mid-western stainless steel representative; John Walker, composite steel representative, and E. H. Dau, sheet and plate representative.

Iron and Steel Division, War Production Board, is staging an elaborate "Steel for Victory" exhibit at the main entrance to its offices in the Social Security building, Washington.

Mack Trucks Inc., Long Island, N. Y., has been producing high-precision and high-strain parts for the Republic Thunderbolt, P-47, during the past year.

Curtiss-Wright Corp., New York city, is producing the troop transport plane, C-46, in western New York plants of its airplane division, G. W. Vaughan, president, announced. The C-46 will be built in another factory in Missouri soon.

Sam Tour & Co. Inc. since July 1 has been operating the metallurgical laboratories of Lucius Pitkin Inc., 45 Fulton street, New York city. Sam Tour & Co. Inc., with main offices at 65 Pine street, specializes in metallurgical, chemical and process engineering. Lucius Pitkin Inc. continues as analysts, assayers, chemists, consultants, spectroscopists, weighers, samplers, and shippers representatives.

H. G. Irwin Lumber Co., Garland, Pa., has discontinued the use of the trade names "Durock" and "Silveroc" for the duration of the war. They will, however, continue to manufacture hammer boards under the trade name of "Grade A" hammer boards.

Universal Atlas Cement Co., United States Steel Corp., subsidiary, announces operation of its new cement plant at Northampton, Pa., has begun.

Presentation of the Army-Navy "E" pennant (right) was made by Col. Thomas G. Lanphier (center) to E. C. Clarke, president, Chambersburg Engineering Co., Chambersburg, Pa., on June 25. Merle Beam, employe representative (right), received "E" pins on behalf of employes



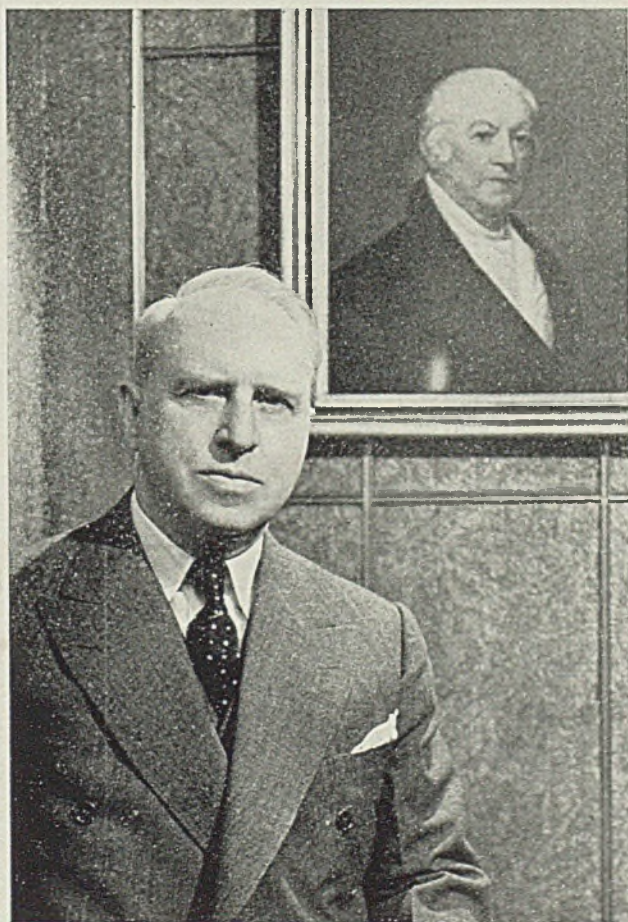
Link-Belt Co., Indianapolis, plant was awarded (left) the Army-Navy "E" flag. Frank S. O'Neil, president, accepts the flag from Col. F. W. McMahan (left)

C. Donald Dallas, president (below), Revere Copper & Brass Inc., accepted the Army-Navy "E" award for the company and the 1875 employes of the Baltimore division at a recent ceremony

Metalworking Companies Cited by Armed Services

Outstanding performances on war contracts won the joint Army-Navy "E" awards for the following companies recently:

Ace Mfg. Corp., Philadelphia.
 Amana Society, Refrigeration Division, Amana, Iowa.
 American Finishing Co., Memphis, Tenn.
 American Smelting & Refining Co., Garfield, Utah.
 Automotive Maintenance Machinery Co., Chicago.
 Brighton-Advance Corp., Brighton, Mich.
 Cannon-Kocka Co., Cleveland.
 Cincinnati Gear Co., Cincinnati.
 Crosse & Blackwell Co., Baltimore.
 Detroit Gasket & Mfg. Co., Detroit.
 Diamond Calk & Horseshoe Co., Duluth.
 Eugene Dietzgen Co., Chicago.
 E. I. du Pont de Nemours & Co. Inc., Du Pont, Wash., and Pryor, Okla.
 Eastern Rolling Mills, Baltimore.
 General Electric Co., Pittsfield, Mass.
 General Instrument Corp., Elizabeth, N. J.
 General Machine Co., Newark, N. J.
 Hammond Iron Works, Warren, Pa.
 Heintz & Kaufman Ltd., San Francisco.
 Heywood-Wakefield Co., Gardner, Mass.
 Jacobs Mfg. Co., West Hartford, Conn.
 Remington-Brand Inc., Illiopolis, Ill.
 United States Bronze Powder Works Inc., Closter, N. J.
 United States Pipe & Foundry Co., Birmingham, Ala.
 Atlas Powder Co., Reynolds, Pa.
 Baker Mfg. Co., Springfield, Ill.
 Bastian-Blessing Co., Chicago.
 Carborundum Co., Niagara Falls, N. Y.
 Dow Chemical Co., Pittsburg, Calif.
 Fay & Scott, Dexter, Me.



THE BUSINESS TREND

Labor Problems Press for Solution as Output Slips

TREND of industrial activity is again slightly lower as the latest weekly indicators reflect some letdown in heavy goods production due to unstable conditions. Fluctuation in the steelmaking rate, slight contraction from the peak of electric power output, failure of coal operations to rebound following the back-to-work order and product design changes are conspicuous causes, but the labor situation—absenteeism, replacement difficulties and growing strike threats—is the major deterrent.

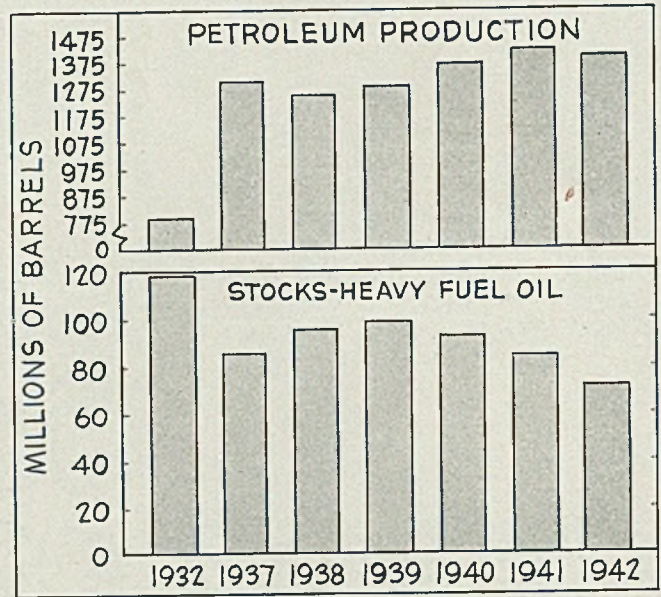
STEEL—Dwindling coal supplies again last week hampered steel production in the Pittsburgh district and other neighboring steel centers. This followed recovery of 5 points in the ingot rate to 97 per cent during the preceding week. Hit hardest by miner absenteeism were captive mines of steel companies, particularly those in western Pennsylvania, where activity last mid-week was only 30 to 50 per cent of normal.

CONSTRUCTION—More than 1000 new war plants, or \$11 billion worth of a total of \$14 billion authorized, are either in operation or near the operation stage. Changes in the overall war requirements picture indicate some properties will not be used for the purposes originally intended, but will be diverted to other work.

Interesting sidelight on the decline in building volume is the perceptible reduction in costs and greater efficiency of construction crews. Job competition, restored by the release of less experienced men to other war industries, is said to be increasing the efficiency of those remaining.

RAILROADS—Carriers have moved into the strongest cash position in history, an Interstate Commerce Commission compilation discloses. At the end of April they held \$2,346,270,000 in cash or negotiable securities, over 1¼ billions more than a year ago. Net income of the 136 Class I railroads for the first four months of the year totaled \$292,350,973, an increase of \$144,303,516 over corresponding 1942 period.

RENEGOTIATION—One aim of the House of Representatives subcommittee studying the contract renegotiation



program is to enact into law common standards not contained in present law to guide government departments as a basis in renegotiating war contracts. Congressional investigators are convinced there is no need to amend the law to allow creation of postwar reconversion reserves.

PETROLEUM—Reduction by the year-end of crude oil inventories above ground to the lowest point in 20 years is foreseen. This development is expected to provide ample reason for relaxation of restrictions on drilling of new wells, possibly higher prices for crude oil through upward revision of unprofitable price ceilings.

High military sources have expressed concern over future supply for domestic war purposes as well as for fighting machines abroad. Requirements of the services, exclusive of aviation fuels and lubricants, are about 1,000,000 barrels a day including Navy and lend-lease supplies. This is about 30 per cent of total demand. It is known that at least half of the cargo space for U. S. foreign shipments is occupied by petroleum products.

Most new well completions have been disappointing from the standpoint of volume, and drilling, which dropped off sharply in 1942, has continued to decline in 1943. Production of crude petroleum during the first five months of this year fell 300,000 barrels a day below government quotas.

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity).....	97.0	92.0	96.5	97.5
Electric Power Distributed (million kilowatt hours).....	3,919	4,111	3,926	3,424
Bituminous Coal Production (daily av.—1000 tons).....	1,758	767	508	2,034
Petroleum Production (daily av.—1000 bbls.).....	4,090	4,008	3,989	3,657
Construction Volume (ENR—unit \$1,000,000).....	42.0	60.1	69.6	401.6
Automobile and Truck Output (Ward's, number).....	19,435	18,645	19,065	22,980

*Dates on request. Lag of one week.

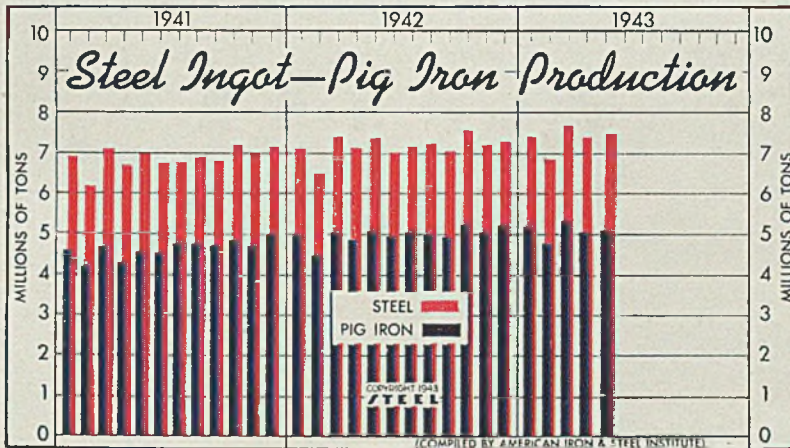
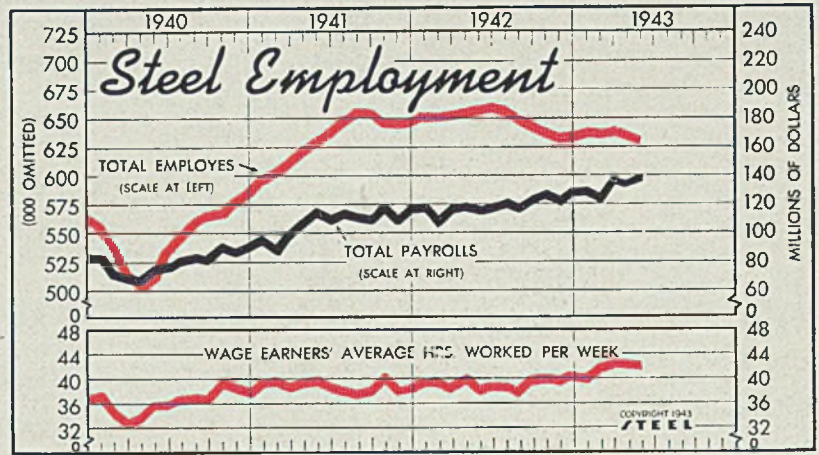
TRADE

Freight Car Loadings (unit—1000 cars)†.....	809†	852	854	754
Business Failures (Dun & Bradstreet, number).....	33	66	54	159
Money in Circulation (in millions of dollars).....	\$17,607	\$17,420	\$17,237	\$12,489
Retail Sales (change from like week year ago).....	+17%	+12%	+15%	+27%††

††Six Months. †Preliminary.

Steel Employment

	Employees—Number (000 omitted)		Total Payrolls (Unit— \$1,000,000)	
	1943	1942	1943	1942
Jan.	637	651	129.7	118.8
Feb.	635	651	122.8	108.5
Mar.	637	653	136.8	117.0
Apr.	634	654	133.3	118.5
May	632	656	137.4	117.4
June	.....	659	.....	118.0
July	.....	655	.....	120.7
Aug.	.....	647	.....	118.7
Sept.	.....	641	.....	124.8
Oct.	.....	635	.....	126.6
Nov.	.....	632	.....	122.8
Dec.	.....	633	.....	129.3



Iron, Steel Production

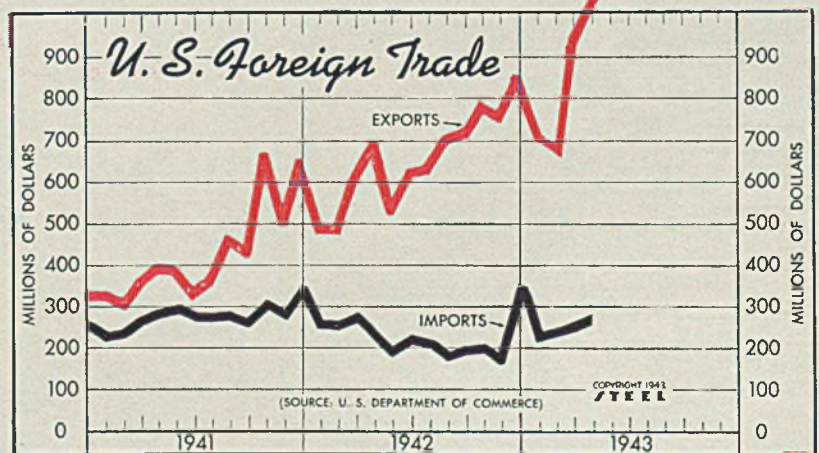
(Net tons—000 omitted)

	Steel Ingots		Pig Iron—	
	1943	1942	1943	1942
Jan.	7,424	7,112	5,194	4,983
Feb.	6,826	6,512	4,766	4,500
Mar.	7,670	7,392	5,314	5,055
Apr.	7,374	7,122	5,035	4,896
May	7,545	7,382	5,178	5,073
June	7,027	7,015	.....	4,935
July	.....	7,148	.....	5,051
Aug.	.....	7,233	.....	5,009
Sept.	.....	7,067	.....	4,937
Oct.	.....	7,584	.....	5,236
Nov.	.....	7,184	.....	5,083
Dec.	.....	7,303	.....	5,201
Total	.....	86,061	.....	59,959

Foreign Trade
Bureau of Foreign and Domestic
Commerce

(Unit Value—\$1,000,000)

	Exports—			Imports—		
	1943	1942	1941	1943	1942	1941
Jan.	698	479	325	228	253	229
Feb.	679	478	303	234	253	234
Mar.	931	611	357	248	272	268
Apr.	1,136	695	385	266	234	287
May	.....	525	385	.....	191	297
June	.....	618	330	.....	215	279
July	.....	627	359	.....	214	278
Aug.	.....	694	455	.....	184	282
Sept.	.....	718	417	.....	196	263
Oct.	.....	776	666	.....	199	304
Nov.	.....	750	492	.....	174	280
Dec.	.....	853	651	.....	356	344
Total	.....	7826	5126	.....	2743	3345



FINANCE

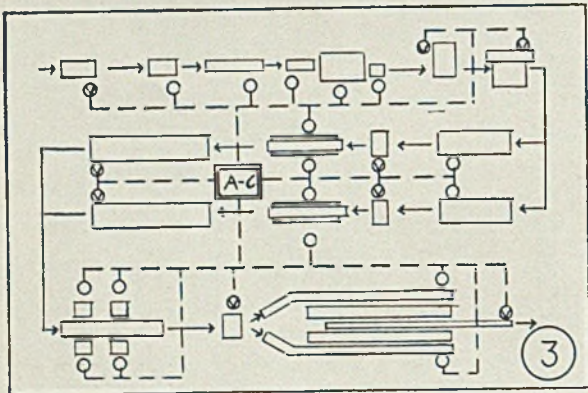
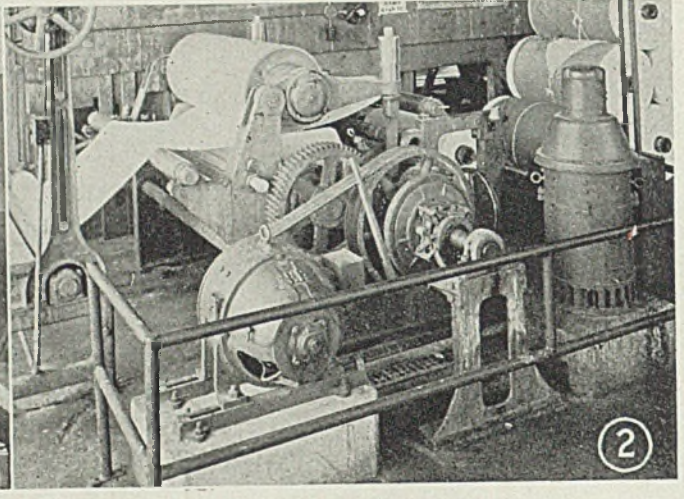
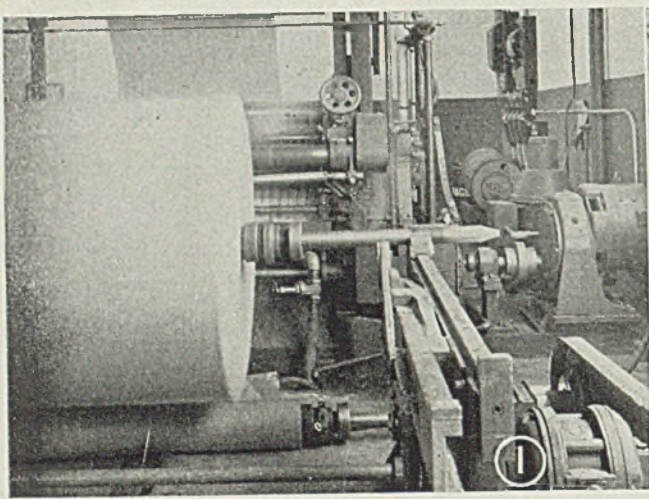
	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet, total in millions)	\$7,558	\$8,503	\$8,123	\$6,407
Federal Gross Debt (in billions of dollars)	141.3	140.7	140.4	77.9
Bond Volume, NYSE (millions of dollars)	52.0	64.0	53.2	29.0
Stock Sales, NYSE (thousands of shares)	4,163	5,279	5,263	2,763
Loans and Investments (in millions)†	\$45,843	\$46,147	\$47,182	\$32,382
United States Gov't. Obligations Held†	31,414	31,753	32,467	16,200

†Member banks, Federal Reserve System.

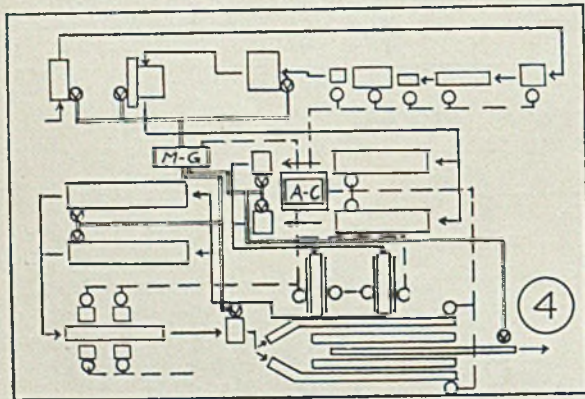
PRICES

STEEL's composite finished steel price average	\$56.73	\$56.73	\$56.73	\$56.73
Spot Commodity Index (Moody's, 15 items)†	243.1	245.4	245.3	233.4
Industrial Raw Materials (Bureau of Labor index)†	114.0	114.2	114.1	99.9
Manufactured Products (Bureau of Labor index)†	99.7	99.7	100.9	98.9

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



○ CONST. SPEED ⊗ ADJ. SPEED



⇒ D.C. 2 WIRE -- AC 3 PH. ○ CONST. SPEED ⊗ ADJ. SPEED

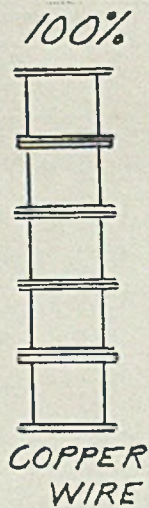
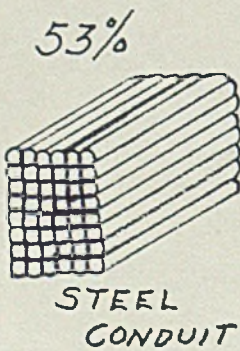
PLANNED MOTOR DRIVES

... save steel and copper

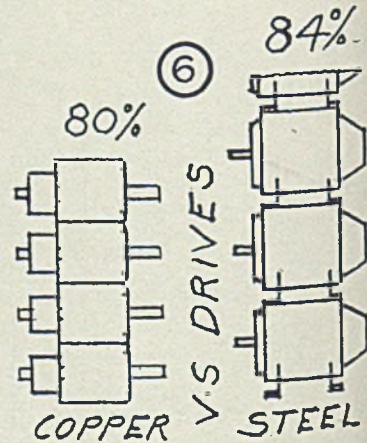
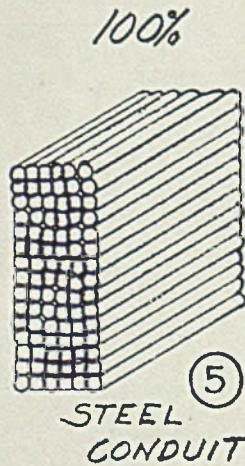
By ROSCOE H. SMITH
Manager of Applied Engineering
Reliance Electric & Engineering Co.
Cleveland



ADJ. SP. BY V-S DRIVES



ADJ. SP. BY D-C FIELD CONTROL



STEEL is more elastic than is cast iron, so the physicists tell us, but how can it be stretched sufficiently to meet all war demands?

Copper available is far below requirements, and probably will be over 1,000,000 tons short of the country's need in 1943. What can be done about it?

Both steel and copper are vital materials in the manufacture of electric motors and in the distribution of power to the machines which these motors are to operate. It is imperative, therefore, to make installations with whatever combination of electrical equipment will result in the least use of copper and steel without impairing the effectiveness of the machine.

Appreciable conservation can be made by giving more consideration to plant planning and layout. The decision as to the kind of motor drive to be applied should be made with the prime objective in mind of accomplishing the necessary results with the minimum expenditure of copper and steel, whether in the plant distribution or in the electrical equipment itself.

Adjustable speed is important to many machines in obtaining maximum output. In the period of industrial expansion prior to the current restricted situation, progressive plant engineers looked upon adjustable speed drives as production tools rather than purely as a means of power. These engineers have made available at each machine the kind of power best suited to its operation, such as direct current for field control, adjustable speed motors, and alternating current for constant speed auxiliaries, with corresponding power distribution and conversion systems.

The adjustable speed drive as a production tool cannot be sacrificed. Its contribution to increased production is too clearly established. *But the method used to obtain that adjustable speed can affect appreciably the solution of the problem of conserving vital war materials.*

Larger plants in particular, commonly have had direct-current circuits to serve adjustable speed direct-current motors. The conversion of this power was superimposed upon the plant's primary al-

ternating-current system. Even under such circumstances, certain machines were frequently placed so as to favor grouping the direct-current motors. This was done in spite of the fact that it might incur a penalty in the form of a less efficient handling of the flow of materials to or from a department.

Fortunately, new variable-voltage adjustable-speed drives have recently been developed and are now in production in sufficient volume to provide a practical solution for many adjustable-speed driving problems. These sets, such as the Reliance V°S drive, are designed to require little floor space, permitting their location at or near the respective machines they serve. The variable speed motors are mounted directly on the machine with speed adjusting rheostats and "start-stop" push button stations placed at the operator's convenience for maximum machine performance. Because all power requirements are served from the regular alternating-current distribution system of the plant, time, expense, wiring materials and accessories are conserved.

Fig. 3 represents a plant with machines arranged to keep material in process, traveling in a direct route from start to finish of the operations. These machines require 17 constant speed drives and nine adjustable speed drives. Power distribution is 440 volts, 3-phase to all drive positions. The V°S drive is used for adjustable speed requirements.

Fig. 4 represents a plant with the same machine and same drive requirements. In this case, however, the adjustable speed is obtained by using direct-current field control motors. The 440-volts, 3-phase power is distributed to all constant speed drive positions. A motor generator set is located at a central point to convert alternating current to direct (Please turn to Page 140)

Fig. 1—A speed range of 87.5 to 700 revolutions per minute is provided by the 15-horsepower V°S control unit supplying power to a gear-motor drive for this machine. The V°S set takes power from the same alternating-current circuit that feeds the induction motor in the foreground

Fig. 2—The 15-horsepower V°S drive here can operate this machine at a threading speed varying from 10 to 120 yards per minute—a 12:1 ratio

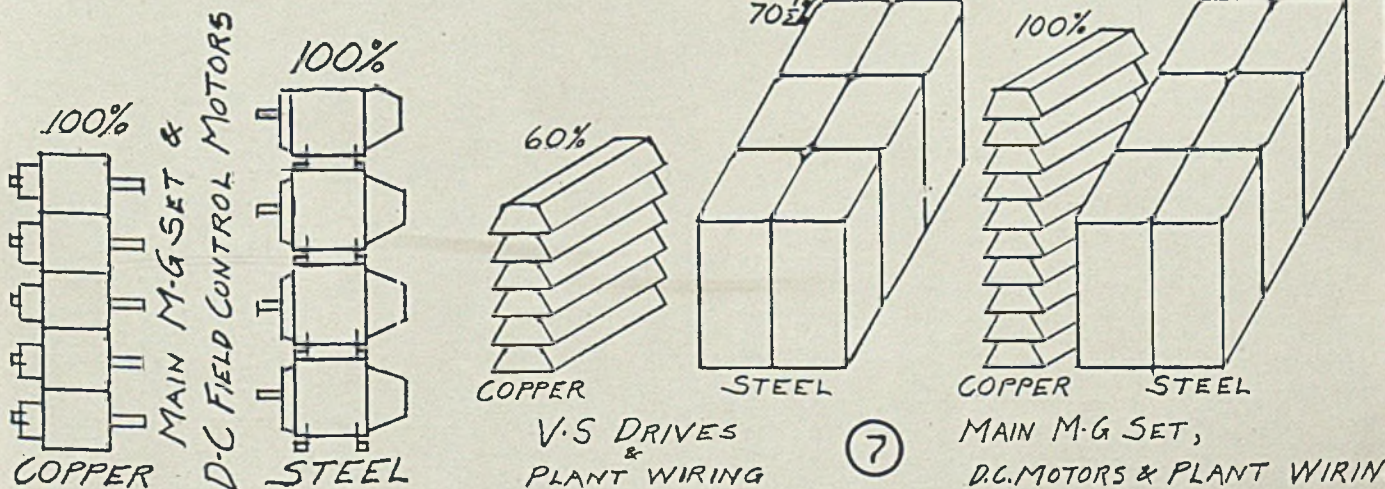
Fig. 3—Reliance V°S drives are used here to meet adjustable-speed requirements

Fig. 4—Adjustable-speed requirements, identical with those shown in Fig. 3, are satisfied in this case by using direct-current field-control motors. Note complexity

Fig. 5—Comparison showing how only 53 per cent of the steel for conduit and only 40 per cent of the copper for wire are needed for servicing the V°S drives

Fig. 6—Comparison of copper and steel required by the two different drive systems

Fig. 7—Overall comparison of material for drives and power circuits for the two drive systems



MAKING 90



Fig. 1. (Above) — Desert training in California firing 90 - millimeter anti-aircraft gun at night. Official Signal Corps photo

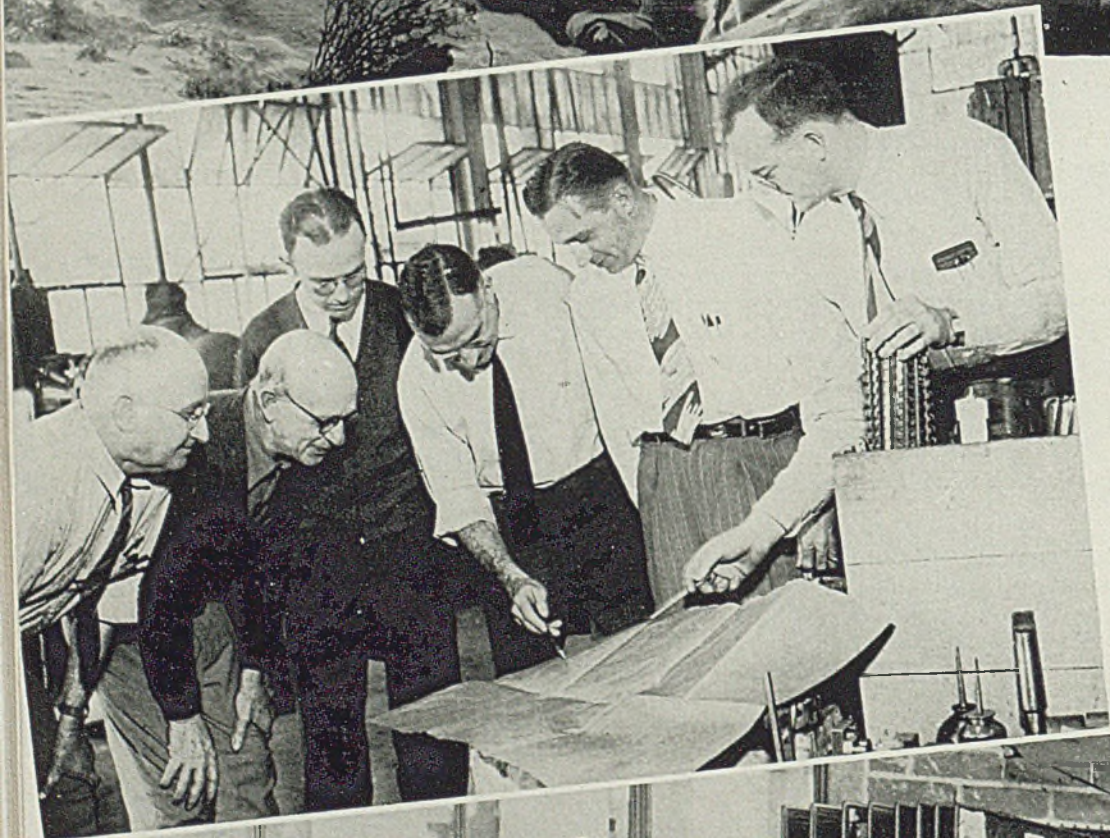
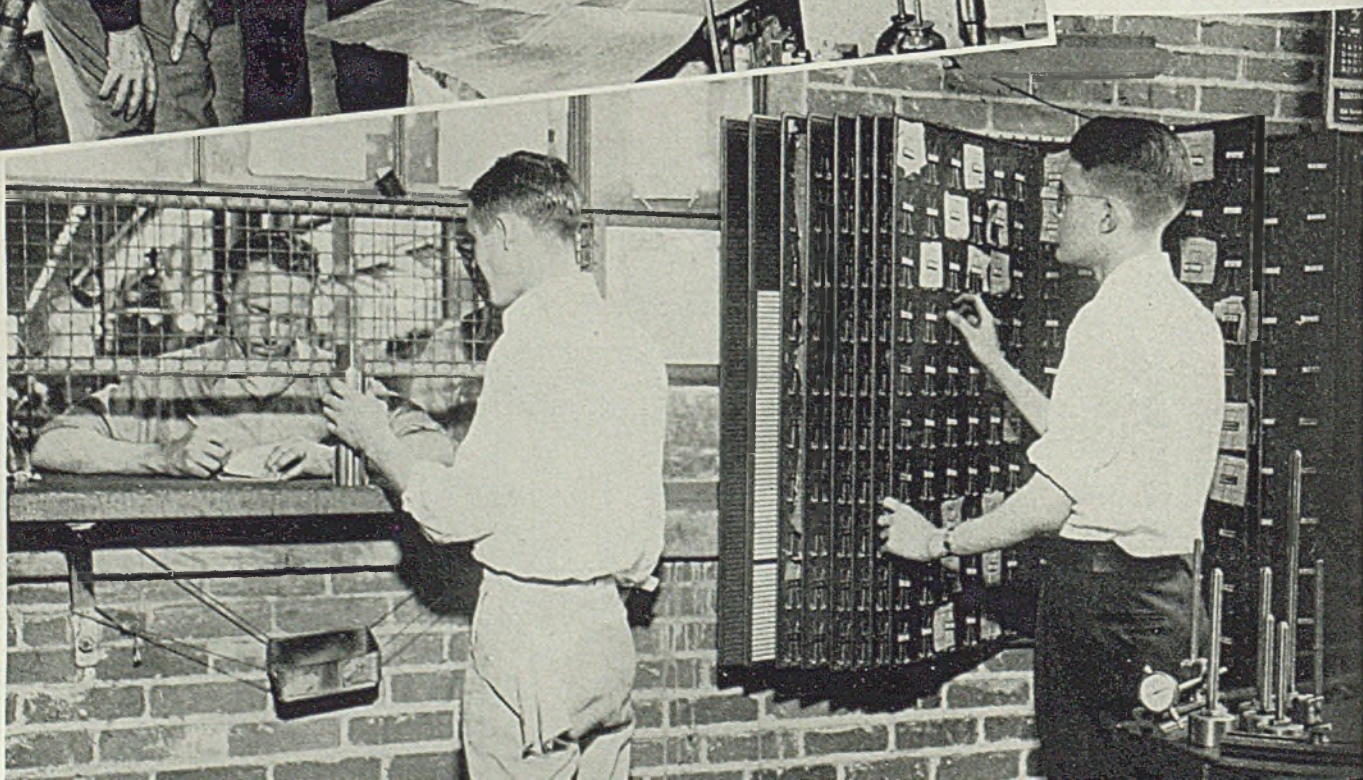


Fig. 2. (Left) — These are the men responsible for 90 - millimeter gun production at the Wheland plant: Left to right — Fred M. Arnold, chief engineer; Fred McKinney, tool room foreman; Roy Smith, superintendent, tool room; W. H. Wilson, manager; Charles W. Wheland, vice president in charge of production; A. D. Willis, tool engineer

Fig. 3. (Below) — Tool room checks out tools to workmen using register system



-M.M. GUNS

Depends Largely Upon Correct Tooling

MARKING the Civil War "battle above the clouds", four Parrott guns today stand sentinel at Lookout Mountain Point over the sweeping Tennessee valley. They were little affairs that lobbed 33 cast iron balls each at the Federals, who were fighting down below. And on the spot where many of their little iron shot bounded, the new Chattanooga gun plant of Wheland Co.'s 90-millimeter gun division is now in huge production on this ordnance piece that has been found so effective in the Tunisian campaign. Among the first in the field on 90-millimeter gun production, the Wheland Co. revamped drawings, did much redesigning, tooling and rebuilding of old machine tools loaned to it from Watervliet arsenal of the Army Ordnance Department.

The company makes all parts of the 90-millimeter gun—breech ring, breech block, rails, supports, internal components, tubes. There are 93 parts in all, a strange and fascinating departure from the crude design of the Parrott gun which was about the only field piece used during the Civil war. The Wheland tooling for the 90-millimeter had a lot of pioneering within it. Methods and practices were established which others

are now following. Much credit for the success of the Wheland operation is given to the dynamic drive of its vice president in charge of manufacturing, C. W. Wheland.

Successful mass production of this gun is, of course, entirely a matter of tooling. In the hurry to meet schedules, with production among varied tool companies delayed from three months to a year, it was necessary for Wheland to set up a completely equipped tool room to produce this gun. The company has done practically all the tooling in the plant except standard size drills and taps.

All forms of cutters and special tools, face mills with inserted teeth, special radii cutters, extra-length reamers, special end mills have been designed, adapted and built. The company's unusual ability to go this hard road in tooling alone is, I feel, one of the distinguishing features of Southern manufacturing enterprise.

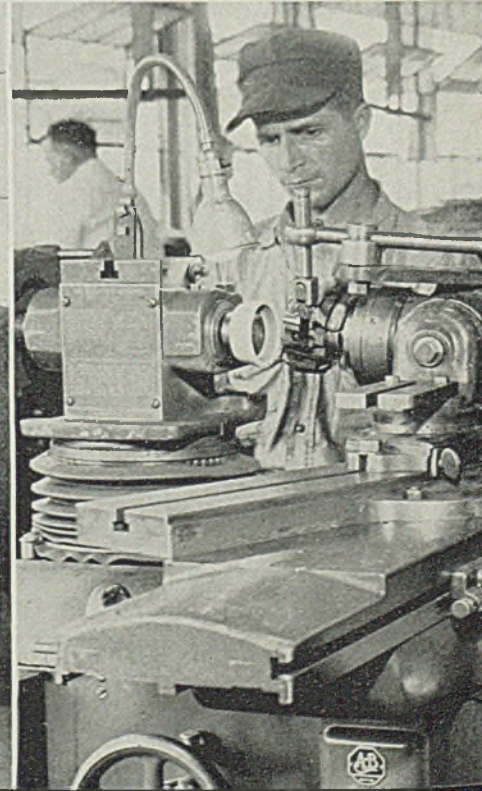
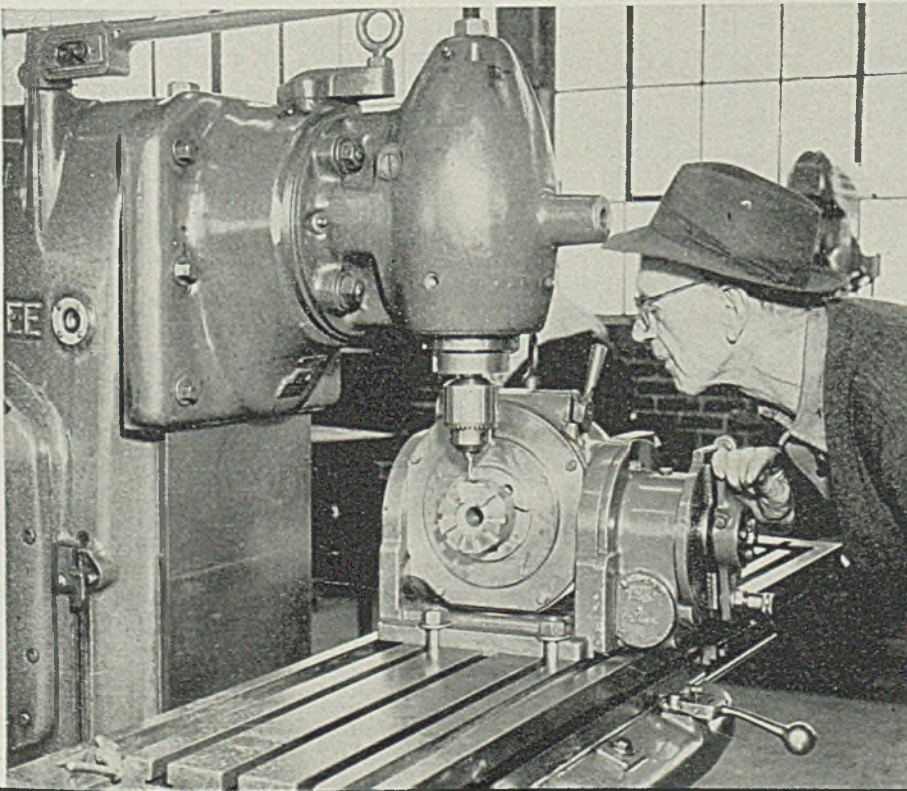
Fig. 4. (Left, below)—Milling a spline gage in the tool room

Fig. 5. (Right)—Another tool room worker is shown grinding a face mill for use by the gun shop

Equipped with latest models of engine screw cutting precision lathes, milling machines with adjustable tables and heads, surface and cylindrical grinders, jig boring machines, furnaces for hardening and tempering, an air-conditioned laboratory for gage testing, well ordered tool cribs, an optical Bausch & Lomb comparator to check screw thread forms and cutter shapes—this Wheland tool and pattern shop is a model in equipment, efficiency and personnel. The master tool makers at Wheland will tackle anything and they pretty much had to when they took over the 90-millimeter gun as one of the first prime contractors.

Certain drawings for varied jigs and fixtures came from the arsenal, together with a scramble of machinery from which many parts were missing, others broken in transit. These drawings established a criterion, but it was necessary to completely redesign many of the fixtures. These fixtures were completed entirely by the Wheland Co. from the drawing board, through its own foundry, through the machine shop, and on to tool room and gaging laboratory.

The flow of responsibility is from C. W. Wheland, vice president in charge of



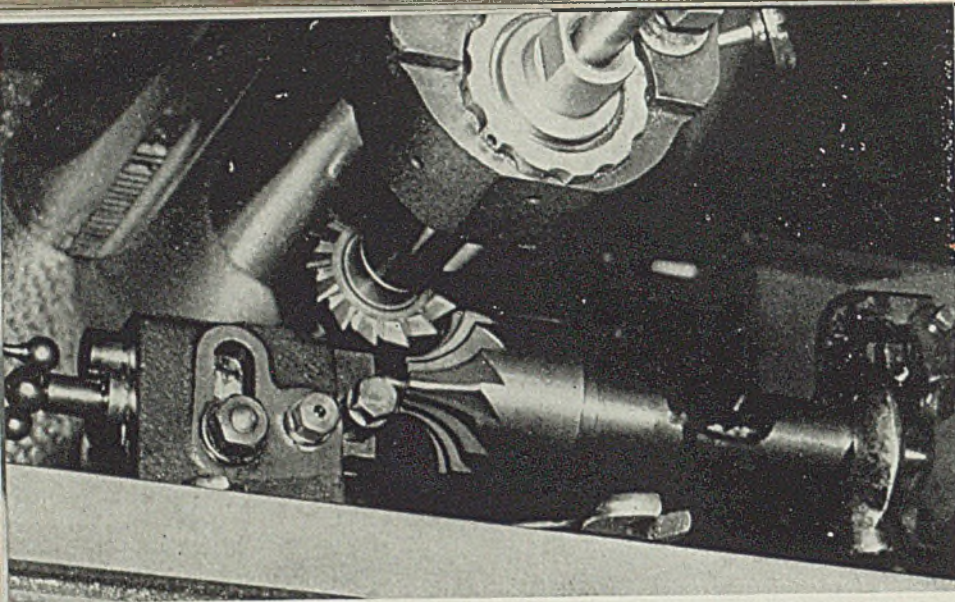


Fig. 6—Cutting teeth into a radius end mill in the tool room

manufacturing; through W. H. Wilson, manager of the gun division; to Fred M. Arnold, chief engineer, gun division; to Roy Smith, superintendent of the tool room, who has co-operating with him A. D. Willis, tool engineer, and Fred McKinney, tool room foreman. Usual output of the company includes wood-working machinery, oil drilling equipment, draw works, rotary pumps and special contract jobs.

C. W. Wheland handed the concepts of jigs, fixtures, patterns of tool design to Arnold, whose staff of draftsmen and technicians have done an excellent job of tool engineering and construction. Outside tool makers were called in on some of this work under the prodding of government expeditors for more speed at the start. But 90 per cent of such fixtures were found to be faulty and most of them could not be repaired. Thereafter, the Wheland organization learned to rely pretty much on itself.

Let me take you around this shop and stop to observe a few of the many interesting tools in production the day I was there. Recently a change was required in the machining of forged tubes

(gun barrels to you). To properly machine this changed specification it was necessary to revamp the tell-tale gaging instrument previously used in checking the bore. This is the instrument that is used to check the concentricity of the gun tube in and out in the rough so that when placed in the lathe for internal boring and external removal of metal, there can be assurance that equal distribution of metal will be obtained. So a new telltale gage design was on the table under construction when I was there. This gage consists of a bar having what amounts to an outside micrometer set into its tin. The bar arrangement works on a pivot which actuates a specially-designed indicator graduated to thousandths and located on the fixture base, permitting the operator to determine accurately the i.d. of bore to the o.d. checking concentricity at any point on the tube.

Mr. Wilson told me that Mr. Arnold had been seen fooling with a steam gage, brought down to the office entirely dismantled—after a sleepless night. After three days of tinkering, there evolved this new telltale indicator—a very capable gage. It is merely one of many Arnold origination to be found in the Wheland setup.

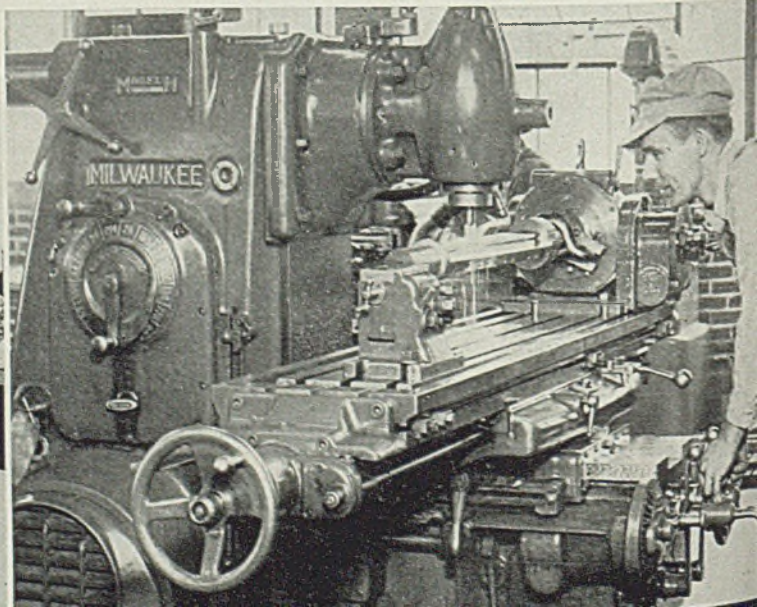
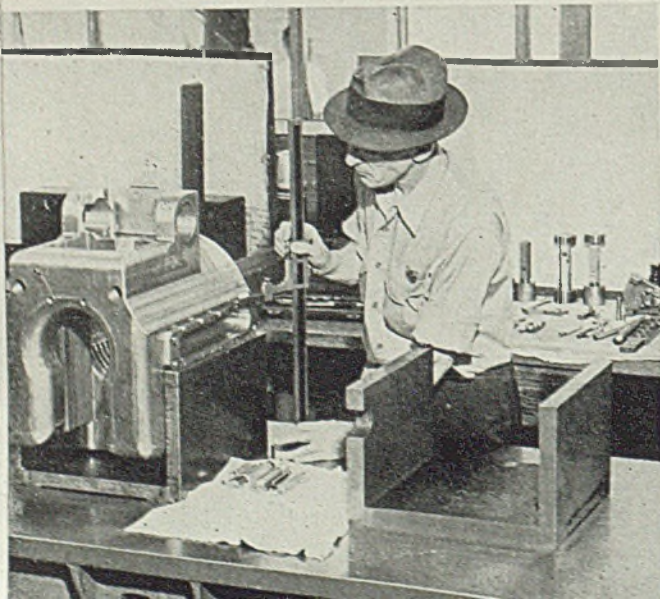
Another interesting tool observed in the making, was a 1-inch radius cutter, processed through the tool room in batches of six. This is hardened to 62 rockwell C. It is made of Clearite—a high-speed tool steel, has 12 flutes. It goes through the gaging laboratory for radius check of 0.002-inch tolerance. This is one of the regular operating phases of the tool room, constantly building these formed end mills that cut exacting radii on the breech ring of the gun.

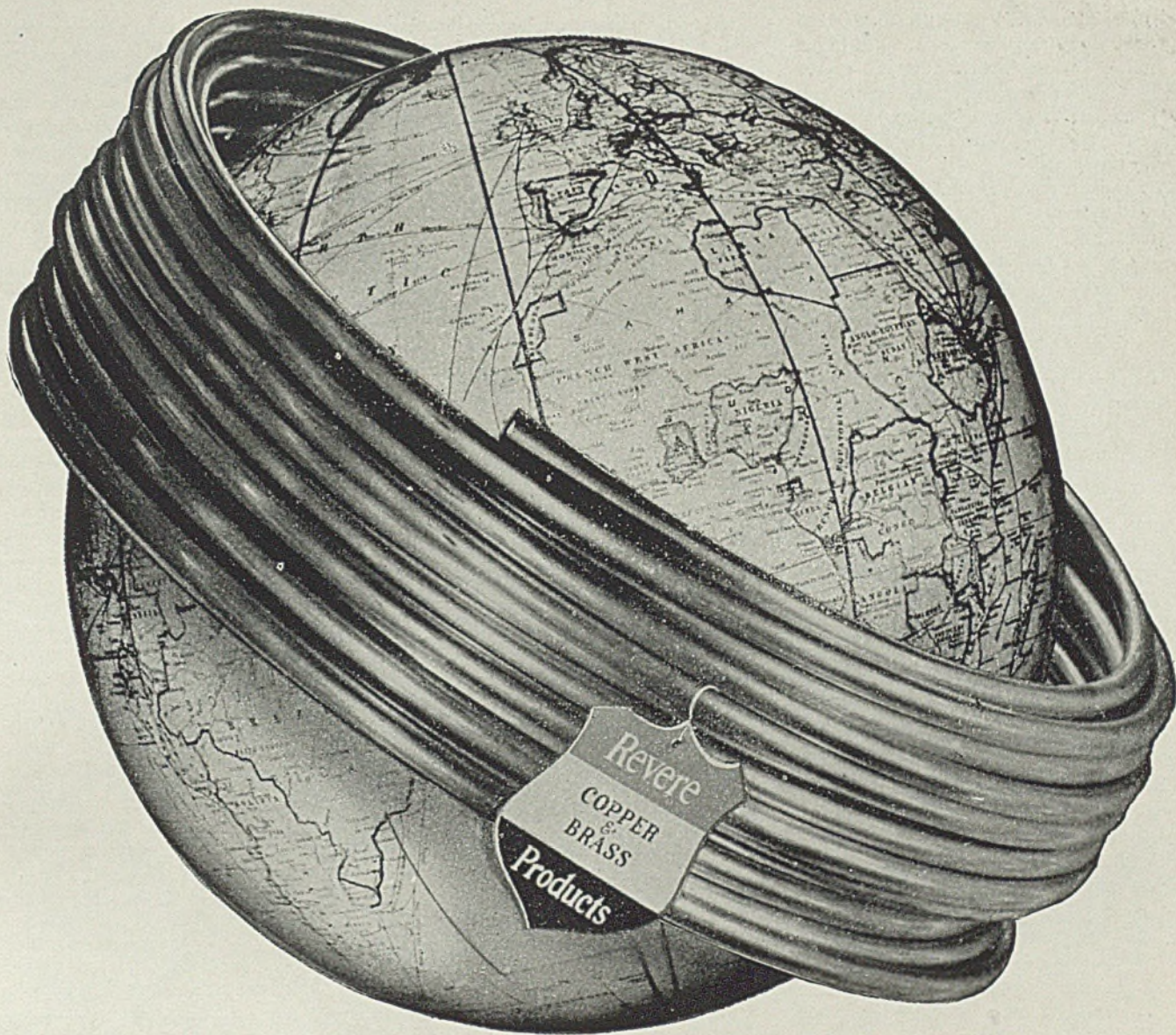
This tool is forged into a billet by Wheland foundries, turned from this blank to the desired shape, set up in an indexing geared head on a Milwaukee milling machine, gashed with the proper cutter, given a hardening heat treat. After this it is ground, backed up and made into the finished tool on a Cincinnati tool grinder.

The fixture for milling the slot in a support was in process of construction, another Wheland design. This was really a re-fixturing in that the original had proved a little light. In fact, much present work here is of that nature. Careful survey is being constantly made to improve the tooling that has already been evolved; "re-tooling", they call it. The tolerances on the end slots of

Fig. 7. (Left, below)—Breech ring of 90-millimeter anti-aircraft gun being gaged on surface plate in inspection room. Note special fixtures in which ring is placed

Fig. 8. (Right)—This tool room worker is milling screw slots in a reamer frame to be used in making parts for the 90-millimeter gun





TODAY copper fights on the global fronts

Today the copper industry is working all-out to win the war. No copper is available for anything else. But post-war planners with specific problems in metals are referred directly to the Revere Executive Offices in New York.

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this fixture are 0.001-inch to 0.00125-inch. Locating plugs are arranged to permit revolution of the fixture 180 degrees plus, permitting a second milling operation in the turn to gain proper width of the fastening pads on the support being machined.

The tooling of the intricately contoured Hydro-Tel templets for profiling on the Cincinnati vertical milling machine and the Pratt & Whitney Keller, is another interesting tooling job. These are of hardened tool steel lapped to shape within tolerances of 0.0002-inch. A cast iron lap is used with a lapping compound by bench tool maker. These templets originate shapes and the accuracy of the gun components machined is such as to make this lapping critical. All such templets are checked in the controlled-temperature gaging laboratory.

One of the parts machined on the Hydro-Tel or upon the P & W Keller is the automatic cocking lever. Of its 12 operations, three are profiled by these templets. The right and left hand extractor made from tool room templets and securing fixtures, the sear, breech block and chain terminal cranks, as well as the cocking lever, are intricate parts that are thus machined.

One of the most interesting tools that I saw was the geared offset head used for cutting the extractor pockets. Then there was the wood-pack reamer, used for finish grind of the tube rifling—an exquisite job of tooling.

All fixtures covering the 93 parts of this 90-millimeter gun are made in the company's own tool room. Some were not engineered or designed here, but all of them were constructed here except a few standard tools. Most gun tooling and machining is, of course, of special design. "Designed, cast, finished in our own plant; that is what we are proud of," Mr. Wheland commented.

To check the desired accuracy which is demanded of these 90-millimeter guns,

inside and outside diameter micrometers from 1 to 16 inches are used. The tool crib employs a simple requisition control of these instruments. These gages are issued from the tool crib by slip requisition in triplicate. One of these forms is kept by the worker, a second is pegged on the shift call board, a third ultimately gets into the permanent file.

At shift end, the gage is turned in, the paired forms are destroyed, the file form is used to signal the gage inspection requirements of that shift. All gages and other tools are routed to the controlled-temperature laboratory at shift end where they are inspected and adjusted under controlled temperature conditions and made ready for the shift use the next day. This prevents entirely such alibis as "he tampered or dropped the gage on the last shift." This inspection is of 24-hour nature and no shift works with gages that have been used more than 8 hours without inspection.

Stepping into this controlled-temperature room in charge of E. R. Williams, a tool engineer and master toolmaker, I came first upon an instrument that is known as a rail gage and is used for dimensional control of distance between support pocket and breech ring pocket, with tolerance within 0.003-inch. It takes about 4 hours to acclimate the metal of this gage to the 68 degrees Fahr. temperature constant of this controlled atmosphere room.

I noticed a box of 34 broaching cutters, sparkling like jewels. They had just been reground and were in for final inspection before going out to rifle more gun barrels. Before these are placed back in the plant for use, they must pass through a tool grinding inspection in which each broach blade is checked on the comparator for form, tool shape and radius of the tool lip.

Fig. 9—Portion of temperature controlled gage room. Optical comparator at left

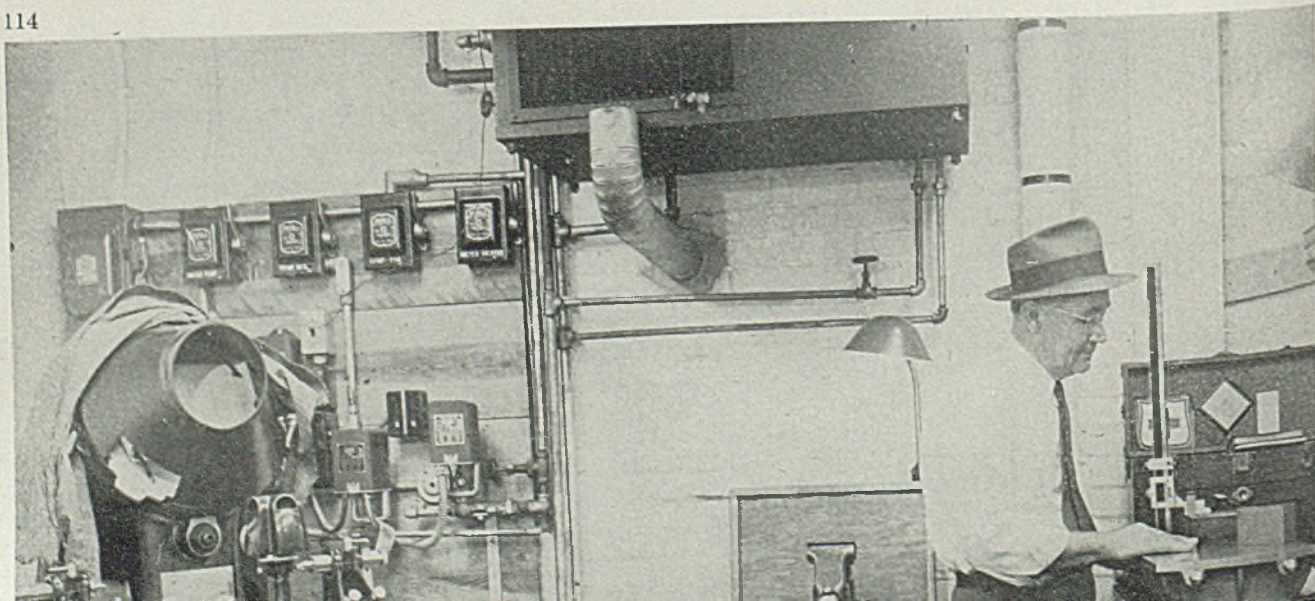
This gage inspection control room abounds with the most modern equipment. Hoke A-B-C blocks are used, the reference sets, of course, being in the laboratory while the production inspection sets are used in the shop. There are such other fascinations as master gage blocks, super micrometers reference verniers, comparators, sensitive indicators.

There are many inspections throughout the gun division, Mr. Wheland's policy being that of catching the error at the seat of the crime. This saves man hours that otherwise would be expended. In addition, there are other production inspection checks on critical parts. For example, when the breech ring comes from the machines, it is taken over by bench workmen who use hand files, hand grinders, emery cloths and lapping compounds on certain critical radii to eliminate all rough edges, and to assure by varied plug, screw and depth gages that all holes have been properly machined.

From here, on a specially designed dolly, the production inspected breech ring goes to the final inspection room, air conditioned for accuracy. Before arriving, this ring has received more than 20 production inspections. After being in the final inspection bays, every screw hole is checked in relation to major and minor diameter of thread, depth, elimination of sharp corners, agreement with tolerances on all radii, planes, angles, vertical and horizontal measurements.

Chief inspector is R. R. Caskey. For a time, because of its necessary standards in establishing quality inspection control, the Army Ordnance Department maintained a large "on-the-ground" inspection staff. Since Wheland has delivered, the department is composed only of company men, a small complement of army men remaining only to sample the final inspections. All components of the gun are inspected, so far

(Please turn to Page 143)



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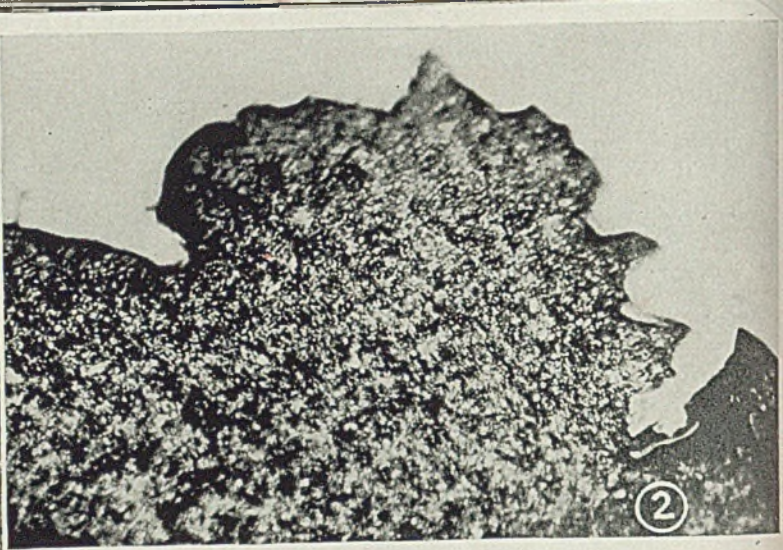
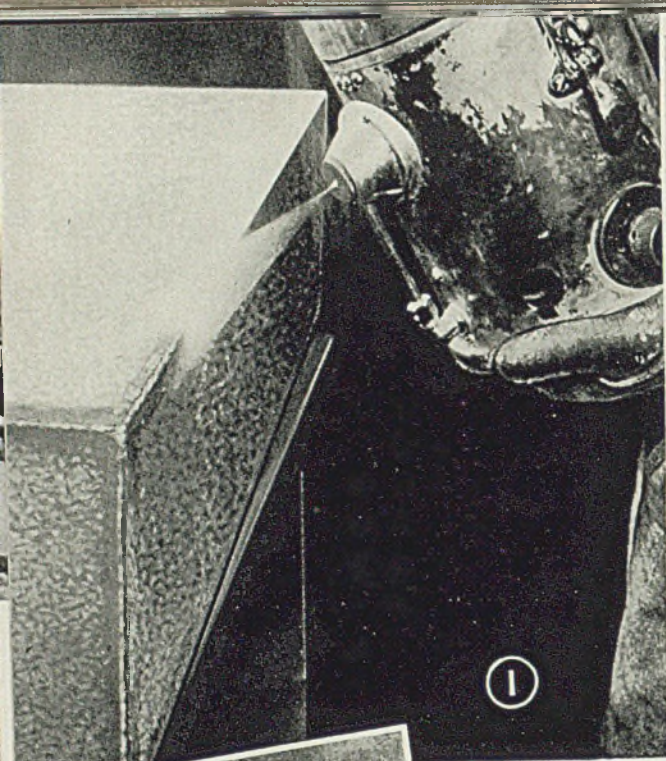


Fig. 1—Spraying on a protective coating of lead-base alloy by means of a special device for handling this low-melting point material. This is a ready method for renewing the zinc coat on welded sheet metal constructions where the heat of welding has vaporized the original coating

Fig. 2—Micrograph at 500 diameters shows mechanical bond between sprayed metal (dark) and steel base (light area). Smooth base metal is readily tinned by this method

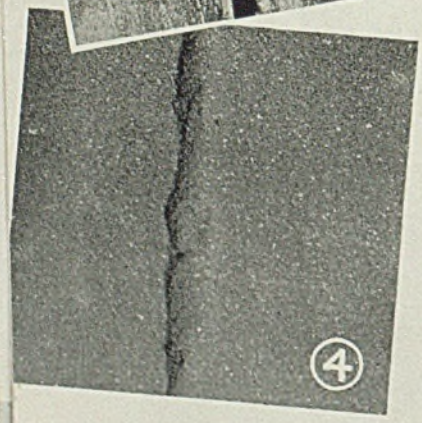
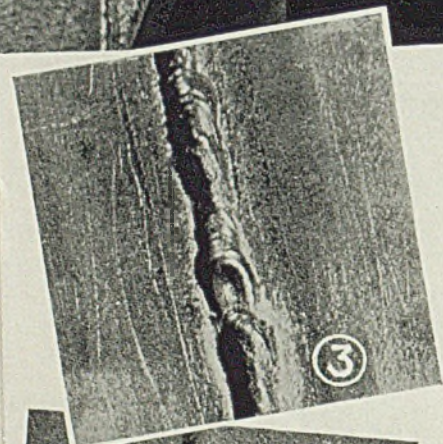


Fig. 3—Portion of arc weld before spraying

Fig. 4—Same arc weld after renewing original protective coat by spraying. Method applies coating that is evenly distributed, positively covers base metal and serves as excellent base for paint

ALLOY-SPRAYER

... coats new work, "regalvanizes" old material, patches weld-burned areas

A RAPID low-cost means of applying a protective metal coating to metal assemblies or structures, of re-coating areas from which the galvanizing has been burned by welding, and of patching or repairing small areas in large galvanized assemblies where the coating has been damaged, has been developed by the Alloy-Sprayer Co., 2040 Book building, Detroit.

The operation involves spraying the surface to be protected with a coating of "Galv-Weld" metal by means of a special spray gun. This unit is a portable, self-contained gun-type device with thermostatically controlled metal melting pot and a means of atomizing and spraying the melted metal. It is operated by air under pressure in much the same manner as a paint sprayer. A trigger control button on the handle is pressed during the actual spraying. The equipment is sufficiently light and compact so that even when filled with metal, it can be manipulated readily by hand.

Moreover, it appears that an actual tinning of the base metal with the sprayed metal is effected by the process. Thus, under certain conditions, sand blasting or other extensive preparation of the surface of the base metal is not necessary. This can eliminate former costly and tedious preparation methods.

A typical use of the sprayer is for regalvanizing areas from which galvanizing has been burned during arc or resistance welding operations. The oxide remaining from the welding operation first is thoroughly brushed off and the area adjacent to the weld similarly cleaned. Then, while the metal is still hot, the entire burned surface can be sprayed. The thickness of the coating will be from 0.001 to 0.008-inch, depending upon the degree of resistance to corrosion required.

No Skill Required

Since it is not done at the welding station, the spraying can be accomplished by unskilled operators at less labor cost.

Where production sequence does not permit coating immediately after the welding operation, the work first is cleaned and then reheated to 250 to 475 degrees Fahr. and then sprayed. This procedure has the advantage of keeping the operation uniform and the results positive, since the reheating permits the temperature of the base metal to be at a known rather than an estimated level. Reheating for spraying is accomplished by infra-red lamps, oven, or by an open flame, preferably one with a reducing atmosphere. The latter is not absolutely essential, but it has been

(Please turn to Page 139)

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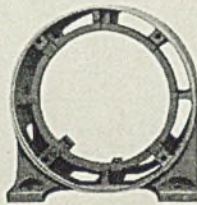
Five features of Century design combine to assure freedom from distortion — freedom from noise — perfect alignment.



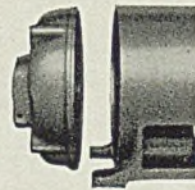
1 The feet are cast as part of the motor frame with machined mounting surfaces providing for a firm attachment and alignment, essential when the motor is incorporated as part of precision equipment.



2 Rigid curved end-brackets are braced for permanent alignment of bearings to maintain a concentric magnetic field, essential to uniform characteristics and quiet operation.



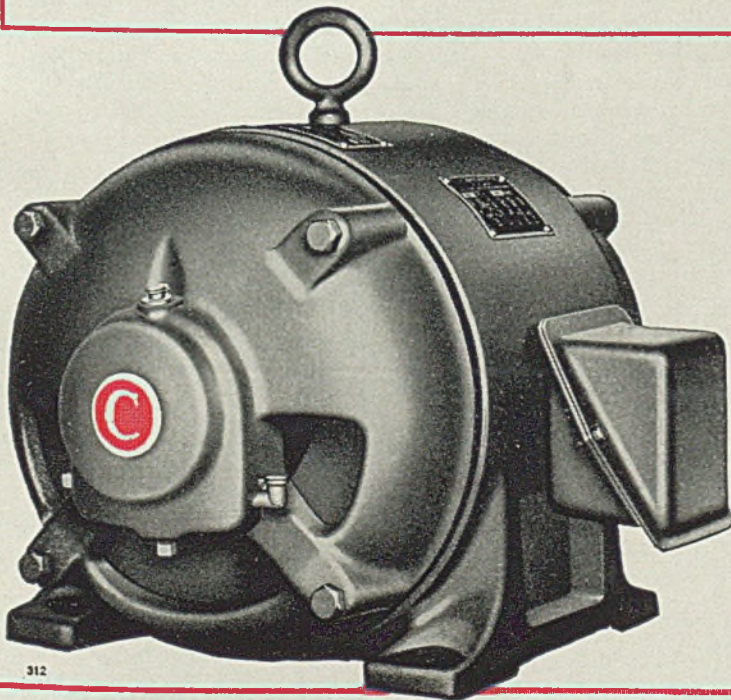
3 Heavily ribbed cast iron frame holds the stator laminations in place — they are locked under pressure — they cannot shift position — the air gap is maintained.



4 A machined bead with close tolerance on the end-bracket fits inside a similarly machined surface on the motor frame — this accurately and permanently aligns the bearings in relation to each other and to the motor frame.



5 The rigid steel shaft is larger in diameter through the rotor which prevents deflection — protects against bearing wear.



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Metallurgist and
Welding Engineer

SPOT WELDING ALUMINUM

TABLE IV—Composition of Aluminum Alloys Welded by the Aircraft Industry

Alloy	Copper	Manganese	Magnesium	Chromium	Aluminum
24S	4.2	0.5	1.5	None	Balance
52S	None	None	2.5	0.25	Balance
3S	None	1.25	None	None	Balance

TABLE V—Minimum Shear Strength of Spot Welds in Aluminum Alloys

Thick- ness of one sheet of two equal thick- nesses welded, inch	Alloy welded		
	3S-½H 35H	52S-½H 52SH	24ST 24ST Alclad
0.016	55	90	120
0.020	75	120	160
0.025	100	170	215
0.032	140	240	300
0.040	190	340	430
0.051	280	510	620
0.064	390	720	840
0.081	570	1000	1080
0.102	800	1320	1320
0.125	1000	1620	1450

TABLE VI—Improvement in Spot Welds by Heat Treating 24ST Alclad

	As Welded	Heat Treated
Average shear load in lbs.	1071	1452
Max. shear load in lbs.	1254	1618
Min. shear load in lbs.	946	1260
Gain by heat treating is 35.5 per cent		

In first section of this article last week, application of resistance welding to aluminum aircraft structures, different types of welding machines and electrodes were discussed. Here are presented details of cleaning methods, a study of the metallurgical factors involved and an examination of possibilities of further expansion of spot welding to aircraft structures

(Concluded from Last Week)

THE FOLLOWING aluminum alloys are found in aircraft construction: 24ST, 24ST Alclad, 526, 3S-½H and 3SH. In Table IV the composition of the various alloys is given. The number followed by the letter S indicates the alloy. T means heat treated and aged while ½H and H represent cold working to the half hard and fully hardened conditions.

Both 24S and 52S have heavy oxide coatings which are customarily removed before any spot welding is performed on them. Likewise 24ST Alclad gives better welding results if the surface is prepared prior to welding. Both mechanical and chemical treatments are suited to the surface preparation of the aluminum alloys.

Mechanical cleaning is accomplished with a fine grade of abrasive cloth, with fine steel wool or with a fine scratch brush driven by a motor. In mechanically cleaning alclad alloys care must be taken not to remove the thin coating of pure aluminum that makes up the corrosion resisting surface.

In chemical cleaning, several different solutions have been used with success. In some cases the surface preparation is carried out by dipping while with large surfaces it may be necessary to paint the etchant on with a brush, allow it to stand for 30 seconds and sponge it off with a wet cloth. One dipping procedure is the following:

Dip the parts for 30 seconds in a 5 per cent sodium hydroxide solution at 150 degrees Fahr., rinse in cold water, dip for one minute in 50 per cent nitric acid at room temperature, rinse in cold water, rinse in boiling water and dry. In some cases it may be necessary to repeat the alkaline and acid dips to thoroughly prepare the material. The commercial cleaning agents are used in accordance with the manufacturer's directions.

Fig. 3. (Left, below)—Diagram of spot weld pull-test specimen

Fig. 4. (Right, below)—Representative metallurgical zones in a spot weld in 24ST Alclad

The chemical solution that is used for brushing is made up according to the following formulae:

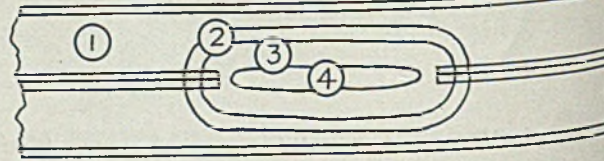
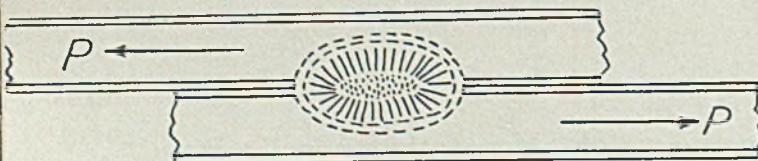
Solution A—2.9 pounds gum tragacanth
8 pounds hot water
0 to 7 pounds denatured alcohol

Solution B—10 pounds 30 per cent hydrofluoric acid

A wetting agent may be necessary with oily stock. The amount of alcohol is varied according to the difficulty encountered in dissolving the gum. The hydrofluoric acid is added to solution A after that solution has been made up.

Too much attention cannot be paid to the preparation of aluminum alloy surfaces for welding. T. E. Piper of Northrop Aircraft Inc. reports that 30 million spot welds were made in one year without a single hole being blown because of improper surface preparation. His company uses a bath consisting of phosphoric acid with a cleaning agent added. It has the advantages of being used at room temperature with a rather long period in which etching may be done without harm to the material. Results obtained with this bath are shown Fig. 5. Complete assemblies are prepared for spot welding with the most efficient use of cleaning labor yet reported.

Machines are set up for spot welding



THERMIT WELDING

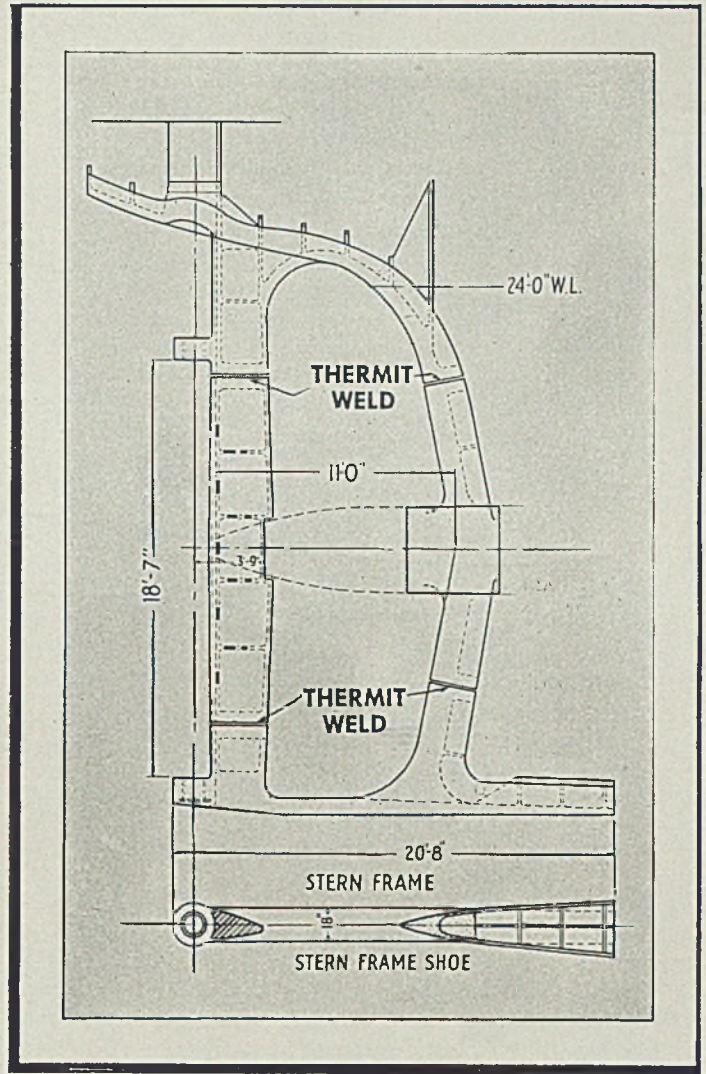
Speeds Fabrication of Large Parts

TO speed construction many shipbuilders now fabricate stern frames from four or more separate castings by means of Thermit welding.

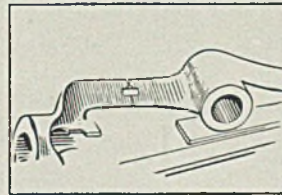
This method also provides the greater strength needed to meet the tremendous strain stern frames are subjected to by wartime zigzagging and top speed maneuvering in heavy weather.

Thermit welding is being used to great advantage throughout industry in fabricating other large parts. When several small castings are Thermit welded into one large unit, imperfections, which may occur in very large castings, are avoided. There is additional assurance of extra strength because the welds are even stronger than the original castings of the same cross sections. Shipping is simplified, as small pieces—easier to handle and requiring less space—can be shipped more readily to the job and fabricated after arrival. Little, if any, machining is needed preparatory to welding and no stress relieving is required.

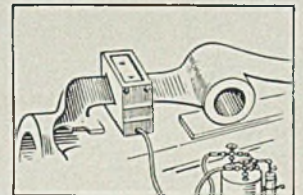
Send for informative, 30-page booklet, "Thermit Welding", describing many applications for both fabrication and repair of heavy parts.



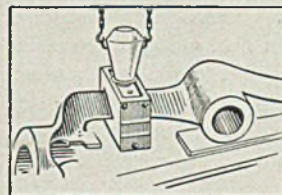
Showing location of Thermit welds in diagram of stern frame for U. S. Maritime Commission ships.



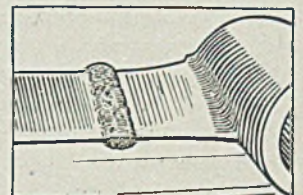
LINING UP



PREHEATING



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FINISHED WELD

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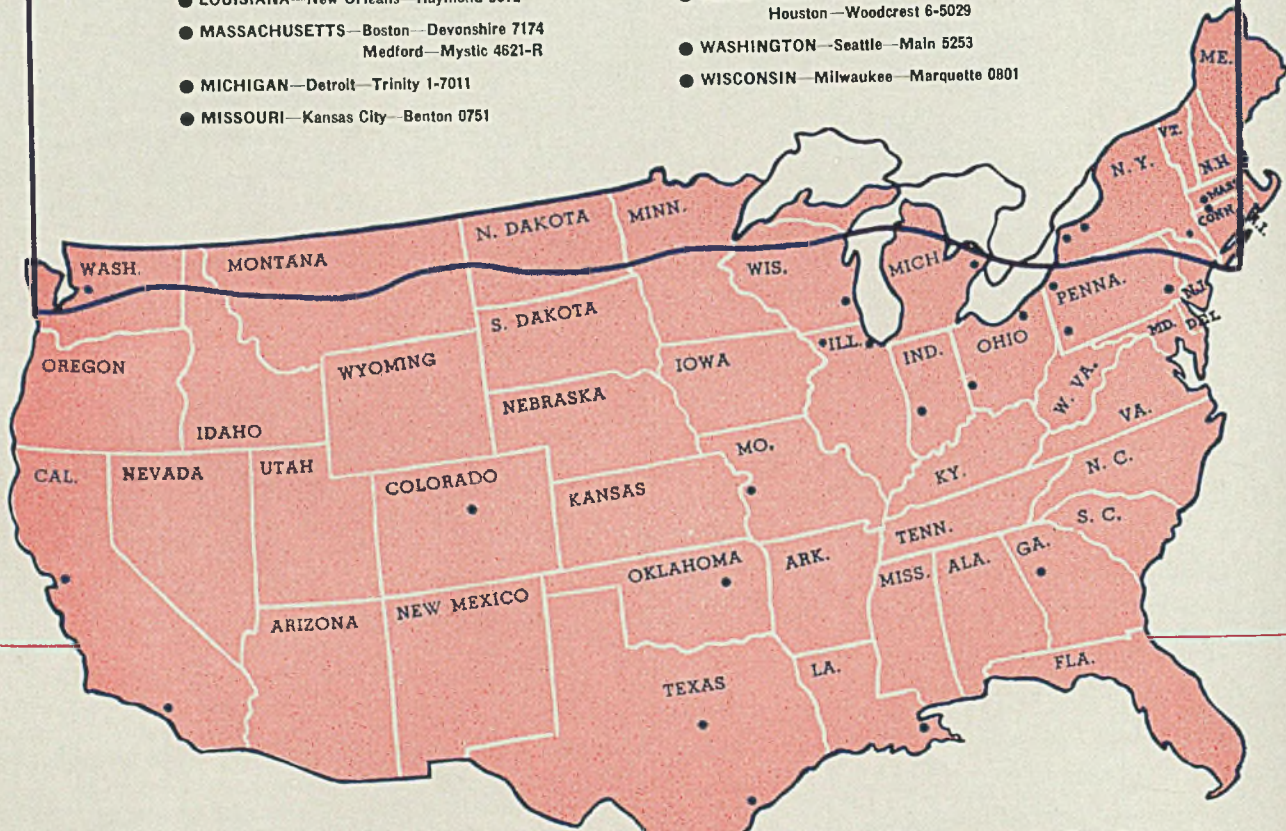
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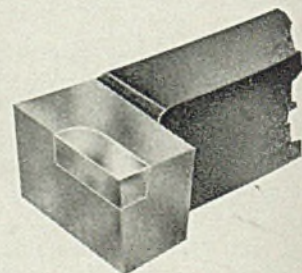
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along empirical lines. Usually plant experience is such that the several variables can be present, but universal practice is to check by means of a test coupon to make sure that the resulting welds will be acceptable. Samples such as the one pictured in Fig. 3 are quite common and the failures fall into three distinct types which are known as "pulling the button" as shown in Fig. 6A; "pull out" shear as shown in Fig. 6B; or clean shear as shown in Fig. 6C. The type of failure is an index to the proper establishment of welding conditions. Tensile tests have given a good account of themselves as a means of checking the quality of spot welds.

Frequently a cross section is made of a weld as a check upon the welding procedure. A hack saw cut is made through the center of the weld nugget, the cross section is smoothed with a file and the weld region is brought out by means of an etch in 10 per cent caustic solution. Primarily this test is designed to reveal the area of the weld which should have a diameter equal to twice the thickness of the sheet plus 0.060-inch. The weld zone should extend at least 50 per cent into the part being joined.

Still another method of preparation is used to bring out more details in the weld structure such as internal cracks and porosity. Specimens are mounted, preferably in the plastic mounts that are found in most metallurgical laboratories, and prepared for etching and microscopic study by means of the usual technique. Etching is accomplished with the following solution: 0.5-mil-liter hydrofluoric acid, 1.5 mil-liters hydrochloric acid and 2.5 mil-liters nitric acid and 95.5 mil-liters of water.

Examination of specimens correctly prepared will show the size, shape and location of the weld zone, the structure of this region, the effect of heat from welding and the presence of cracks and porosity, if any. The principal zones for 24ST Alclad are those illustrated in Fig. 4 and are as follows:

Zone 1: This region shows a typical structure of heat treated and aged 24S which is a rather complicated arrangement of aluminum alloyed or compounded with other elements that make up this material.

Zone 2: This region shows the effect of the welding heat upon the alloy. Agglomerated CuAl_2 , which was invisible under microscopic examination in the heat treated and aged plate, now becomes large enough to be seen. The inner portion of Zone 2, in which incipient fusion has taken place, is considered to be the weakest portion of the weld and is often referred to as the "burned" zone.

Zone 3: This is the weld nugget

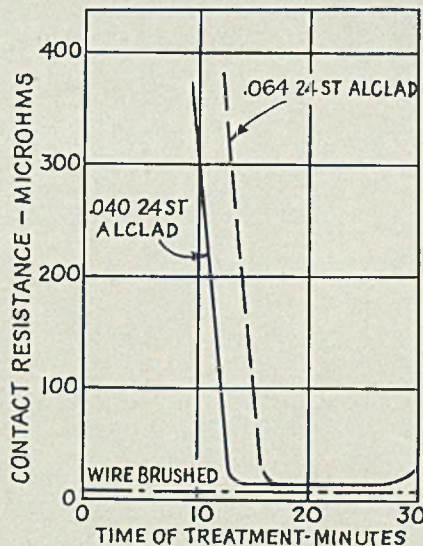
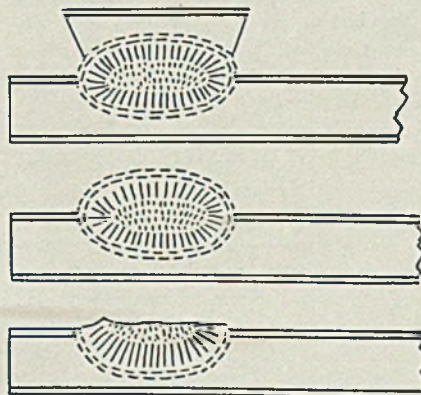


Fig. 5 (Above)—Comparing the electrical resistance of chemically and mechanically cleaned Alclad. Northrup etching solution used

proper and has the typical columnar structure that is always found in spot welds.

Zone 4: This central portion of the weld nugget reveals a somewhat different structure than Zone 3 with the differences being ascribed to an inherent lack of homogeneity in the nugget as may be expected from the fraction of a second allowed for melting and solidification.

In Table V some of the typical strengths to be expected from spot welds are given. Since spot welds are generally loaded in shear, the strength of the weld becomes a function of the alloy welded, the thickness of the material welded, and the machine settings used in making the weld. Welds made with recommended machine settings and with a diameter equal to twice the thickness



From top to bottom—

Fig. 6A—"Pulling-the-button" type of failure

Fig. 6B—"Pull-out" type of shear failure

Fig. 6C—Clean shear failure

of the sheet plus 1/16-inch will exceed the minimum strengths shown in Table V.

Welds made with the stored-energy type of welding machines are equal to or better than those made with alternating current machines. Frequently the stored energy units make larger spots which accounts for a higher shear strength value when one is observed.

Although spot welds are primarily designed for shear, stresses brought about by tension loading are introduced by secondary loads. Spot welds in tension have from 20 to 90 per cent of their shear strength. Strength in tension may be determined by means of the U-shaped tension test piece.

For some time it was obvious to metallurgists that the strength of spot welds in 24ST material was less than it might be if the heat treatment of the sheet had not been nullified by the heat of welding. In heavier sections, especially, this lower strength was noticeable. However, the introduction of heat-treated spot welds has permitted restoration of considerable strength, resulting in a 35 per cent improvement in the shear strength of heat-treated spots over those not given any heat treatment. Table VI gives the results of 100 tests in the as-welded and heat-treated condition to prove this point.

Spot welds in the following aluminum alloys are as resistant to corrosion as those portions of the material that have not been subjected to the welding heat: 2S, 3S, 52S, 53S and 61S. No difference will be found between the corrosion resistance of these alloys as spot welded or as riveted. With 24ST Alclad, corrosion resistance is provided by the cladding but care must be exercised to see to it that the cladding is not contaminated by the alloy of the main body of the sheet through overheating. Spot welds in alloys 17ST and 24ST are selectively attacked under corrosive conditions. Of course paints have found widespread use as protective media in many services.

The present widespread use of spot welding in joining the aluminum alloys has been the fruit of much intelligent research which solved the vexing problems of surface preparation and efficient use of electrical current. Surface preparation through both mechanical and chemical treatment has brought about a high degree of consistency in spot welding practice. Good metallurgical and physical controls have followed through to make the spot welded structures almost foolproof. And the introduction of energy-storage spot welding machines has done much to keep electrical power demands within reason.

The words of J. W. Dawson and B. L.

(Please turn to Page 124)

MATERIALS

By ASA S. KNOWLES

HANDLING PRINCIPLES

*....every plant manager
and foreman should know*

PRINCIPLES:

Reduction in travel distances.

Increased speed.

Elimination of waste motions.

Use of mechanical handling when economical.

Avoidance of duplication of investment.

Co-ordination of interdepartmental handling.

NO ASPECT of shop management gives more concern to many foremen than that of material handling. While it is true that some plants designate particular persons to devote their entire attention to solving internal and outside material handling problems, all foremen must devote some of their time to material handling as it concerns their particular departments. Every foreman appreciates that the size of the output of his department may hinge largely on the efficient and smooth flow of material in process.

Material handling systems as found in present day industry vary. Some plants have no systems at all, and others have systems so highly developed as to be almost flawless. This depends largely upon the nature of the manufacturing process and the amount of time, energy, and money that has been devoted to this problem.

No two plants have exactly the same type of handling because factory buildings and their layouts differ widely. Regardless of the kind of industry, the manufacturing processes involved, or the quantity of materials to be moved, there are *basic principles* of handling with which every foreman should be familiar and which deserve careful study.

Objectives: From the time raw materials are received until they are fully fabricated and placed in finished goods

storage, material handling is the backbone of manufacturing. Low manufacturing costs can be achieved only when waste is at a minimum in the use of men, machines, and equipment devoted solely to getting materials through the manufacturing process. *The best way to handle materials is not to handle them.*

Constant study of material handling operations reveals the following as the fundamental objectives:

Principles: In approaching a material handling problem, it is first necessary to determine *what to move*. When several processes and machines are used in the manufacture of a product, management must decide between moving the product from process to process and moving machines, operators, and supplies. In brief, either the product, the worker, or his tools may be stationary, while other factors are moved. When it has been decided what is to be moved, a further analysis of the problem should be made in the light of these items:

—Reduction in travel distances. All distances between manufacturing operations should be reduced to a minimum. An analysis of the distances traveled on the production floor in moving materials from operation to operation often leads to new location of machinery and equipment, as well as revision of steps in the manufacturing process.

—Increased speed. Only when speed and efficiency are combined in the handling of materials is productive equipment kept constantly busy at maximum capacity. The efficiency of the plant as a whole is greatly increased.

—Elimination of waste motions. Much effort is wasted in handling, piling, and storing of materials because of poor arrangement of manufacturing and storage areas and because improper types of handling equipment are used.

Needless handling operations can be eliminated when the movement of materials is carefully studied with a view to tying in material handling procedure with the layout of the production floor.

This leads particularly to the elimination of "bottle-necks" (places where production tends to slow up because of piling up of materials in process). When handling is studied in relation to layout of the plant as a whole, potential bottle-necks are minimized.

—Use of mechanical handling when economical. When operations are performed continuously, the use of mechanical handling equipment usually results in savings in time and cost, as well as lessening the total time required to complete a manufacturing process.

It is often unwise, however, to use mechanical handling equipment when handling operations recur infrequently because such situations do not justify an investment of capital and special equipment.

—Avoidance of duplication of investment. Unnecessary duplication in material handling equipment increases costs. Many department foremen want their own material handling equipment for exclusive use, even though it is used only occasionally.

This practice must be carefully regulated and unnecessary duplications of equipment avoided. Money invested in permanent handling equipment increases

*The best way to
handle materials is
not to handle them*

Abstracted from *Supervision*, May, 1943.

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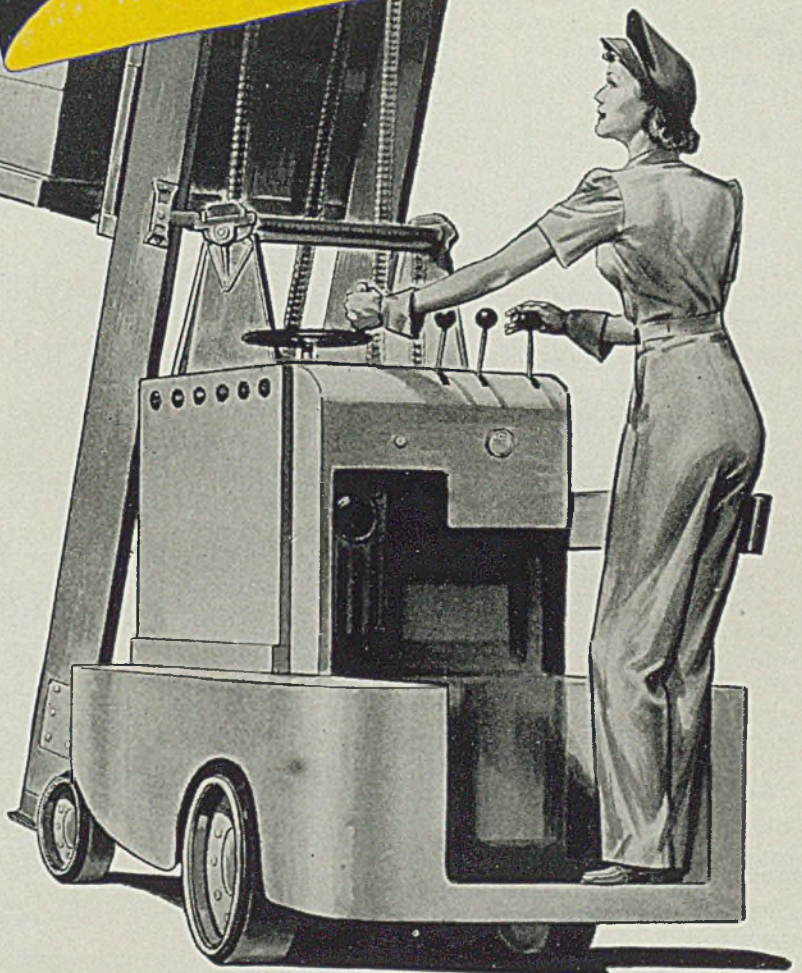
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the fixed costs, such as taxes, insurance, maintenance, etc.

Every foreman's interest in good management should compel him to see to it that investments of funds in handling equipment are kept at a minimum in order that the funds of the business may be used for the most productive activities of the enterprise.

—Co-ordination of interdepartmental handling. Just as standard railroad equipment is a tremendous advantage in the nation's transportation system, internal plant handling systems should permit continuous and flexible service. Equipment needed in one department should be adaptable to possible future uses in other departments.

Standard tracks, roadways, container sizes, etc., permit shifting of equipment to prevent bottle-necks occurring at unforeseen times.

—Materials to be moved. This involves consideration of whether unit articles are to be moved, or whether they are to be placed in containers or kept

in bulk. This in turn resolves itself into a consideration of the physical characteristics of products, containers, and bulk materials.

—Care and condition required. Temperature, humidity, shock, etc., must be considered. Oftentimes, drying, shaping, or hardening may be performed during transportation.

—Transportation required. It must be decided whether materials are to be moved horizontally, vertically, and attention must be given to piling, loading, and unloading.

—Quantity and time requirements. The amount of material required to be moved per period of time, such as tons per day, etc., deserves attention. In addition, careful attention must be given to whether or not the demand for these materials is continuous or just occasional.

Finally, the length of time (months, years, etc.) the service will be needed requires study.

Other matters which must be ex-

amined in the analyses of material handling problems are these:

Power available;

Best route to be followed;

Costs of equipment and installations, and operating costs;

The maintenance costs of the equipment to be used.

The labor problem—amount of trained personnel needed (if any), license required, etc.; and finally,

Lost time of productivity due to change-over of material handling methods.

This involves both man and machine hours lost which cannot be recovered.

Of major importance are the various techniques used in transportation of materials; problems of piling, loading and unloading; use of standard material handling equipment; and the methods of calculating quantities of material handling equipment needed to meet given situations. All must be studied and worked out for most effective flow of materials through the plant.

Practice on Forged Hand Tools Now in Print

Printed copies of simplified practice recommendation R17-43, "Heavy Forged Hand Tools", recently revised at the request of and in co-operation with the War Production Board, are now available, according to Division of Simplified Practice, National Bureau of Standards, Washington.

The first edition of this recommendation, approved by the industry in 1924, listed 361 items or 54 per cent of the 665 varieties of forged tools then offered.

The recommendation was revised in 1927, 1931 and again in 1935. These enlarged the scope of the recommendation to include successively, eye sizes and shapes, railroad tools and certain additional industrial tools. The edition of 1935 contained 479 items. The present revision contains 351 types and sizes.

In addition to the revised simplified schedule itself, the new publication includes a brief history of the development of the project. Copies may be obtained from the superintendent of documents, Government Printing Office, for 10 cents each.

Ohio State Completes Welding Library

A new library on welding, a gift of A. F. Davis, vice president and secretary, Lincoln Electric Co., Cleveland, has been established at Ohio State university, Columbus, O., according to Mr. E. N.

Manchester, university librarian.

The "A. F. Davis Welding Library," as it is known, was placed there as the university has the only 4-year course in welding engineering. This is said to be the first time all important literature on welding has been concentrated in one place.

Non-Irritating Cream Removes Paints from Hands

A new compound for removing lacquer, dopes and paints from the hands without the use of explosive solvents is reported by Dennis Chemical Co., 2701 Papin, St. Louis.

Called Den-Tex, it is merely worked into paint or lacquer on the hands which then readily rinses off with water, leaving the pores open and clean and the skin soft.

The product is said to insure the removal of the most tenacious and resistant material such as airplane dopes, enamels, varnish, resin solutions, etc.

Spot Welding Aluminum

(Concluded from Page 121)

Wise in presenting some thoughts worthy of consideration in promoting a still further application of spot welding have done such a good job that they are quoted as a conclusion for this article:

—*"The spot welds performed in aluminum alloys for aircraft structures are overly suspected.*

—*"This suspicion is not supported by*

the accumulated performance history of planes welded by the earlier technique.

—*"Efforts are being directed toward metallurgical perfection of the weld nugget rather than to the requirements for structural adequacy of the welded assembly.*

—*"Weld inspection and test methods have been developed to disprove the metallurgical perfection of the weld rather than developing methods to determine the relative performance of welds of varying metallurgical perfection."*

There is every chance in the world that the riveting of aircraft structures is not 100 per cent perfect. But operational experience has shown that riveting is a worthy fabricating method. Although weld tests have been quite severe, weld quality is attaining the goal of metallurgical perfection. As a result an increasing number of primary structures are and will be flowing through the powerful jaws of spot welding machines.

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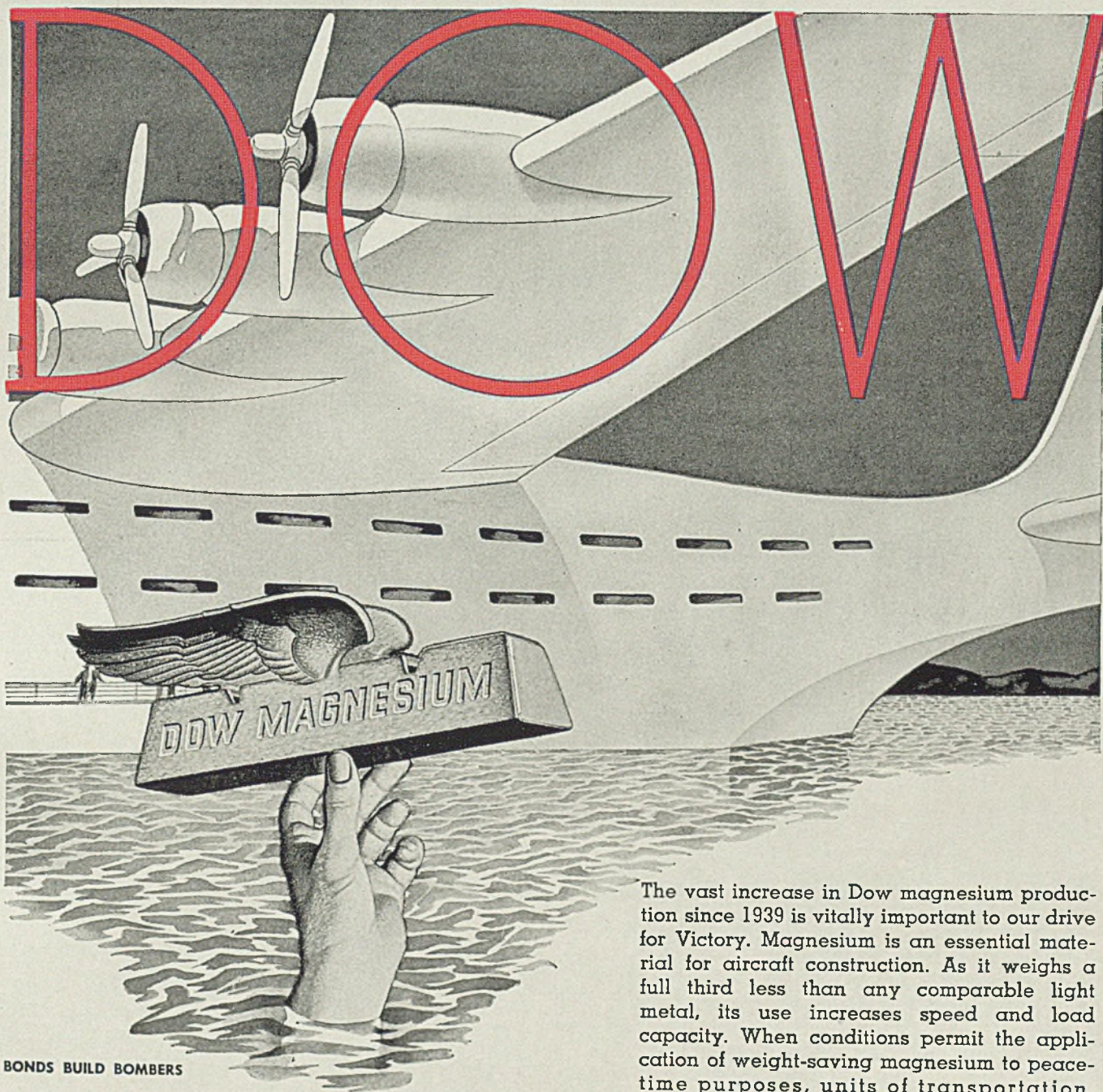
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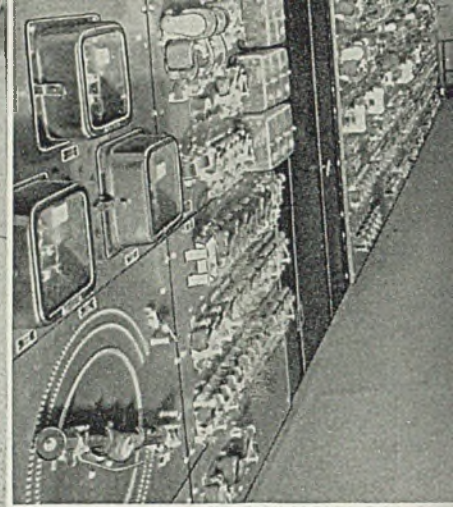
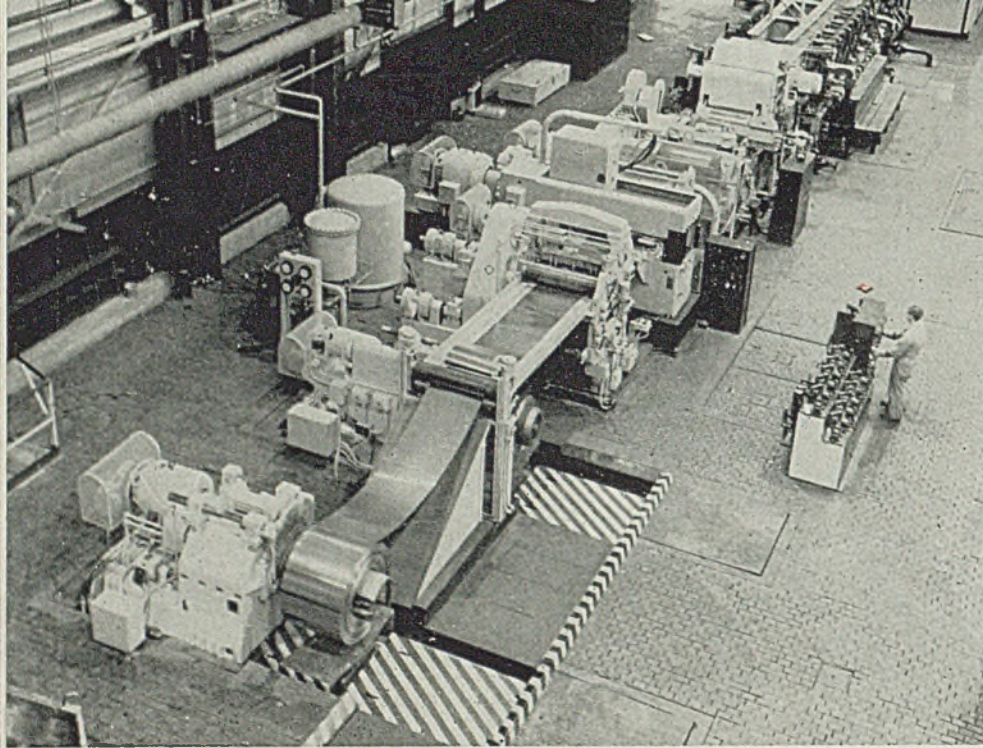
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Left, above—Entry end of line up to fusion unit platform

Center—General view of control

Electrolytic Tinning Lines

Help Solve Tin Shortage

MORE OF the gap between the demand for tin plate and the available supply will be bridged soon with the completion of several of the new continuous electroplating lines which have been under construction for the past year. The line at the Irwin Works of Carnegie-Illinois Steel Corp., Pittsburgh, was the first to go into operation of the 26 new plating units being built at top speed by 11 steel companies to meet the emergency created by Japan's conquest of most of the world's tin supply.

Government estimates, based on regulations so far issued restricting the uses of tin plate, have indicated that the country's military and civilian requirements for 1943 could not possibly be met unless plating methods were developed on a large scale to yield usable plate with considerably less than 1.25 pounds of coating, approximately the minimum which can be satisfactorily applied by the conventional hot-dip process.

Electrolytic tin plate with 0.5-pound of coating comes closest to meeting the fundamental requirements. Where in other respects the electrolytically tinned

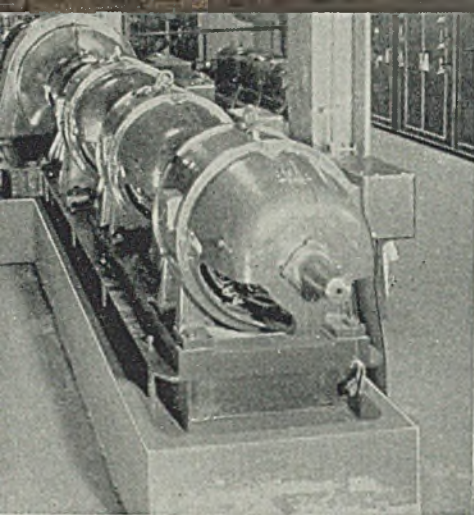
By RICHARD A. GEUDER
 Manager, Metal Industry Application
 Reliance Electric & Mfg. Co.
 Cleveland

product is a satisfactory substitute for hot-dipped tin plate, it is expected to effect a saving of two-thirds of the tin which would otherwise be required to produce the same amount of plate.

A line running only 300 feet per minute for 20 turns per week (160-hours) would save about 1000 tons of tin per year, it is estimated. Actually, all the new lines have top speeds of at least 500 feet per minute, with some even contemplating speeds as high as 1300 feet per minute. On the basis of 0.5-pound coating, the individual lines now being built will, therefore, each have outputs ranging from 750,000 to 1,500,000 boxes per year. With 26 of these lines to be in service within the next few months and running certainly faster than half speed, some idea can be obtained of the importance of the new process and the part it is likely to play in the solution of the critical tin shortage.

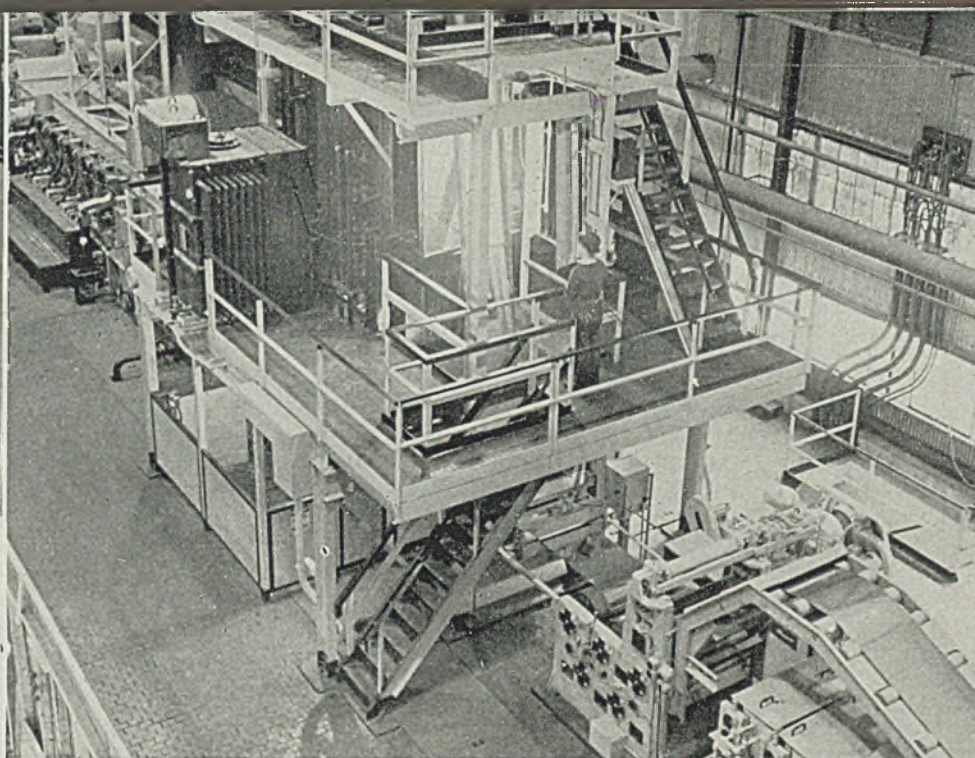
The Reliance Electric & Engineering Co., Cleveland, supplied the electrical equipment for several of the new lines recently completed, and for many of the remaining lines still under construction. In fact, Reliance engineers pioneered the synchronization and control methods which are being used for these lines. They made the first application of them to an electrolytic tin plating line installed at the Gary tin mill of Carnegie-Illinois about six years ago. A considerable amount of experimental work was done with this line in the intervening period and over 3,000,000 boxes of plate, used in dry packs and as can ends in experimental wet packs, have been successfully produced to date.

Four other companies, Clark Controller Co., Cleveland; Electric Products Co., Cleveland; Hanson-Van Winkle-Munning Co., Matawan, N. J.; Electric Machinery Mfg. Co., Minneapolis; and the International Telephone & Telegraph Corp., New York; have been associated with Reliance Electric & Engineering in the development of various phases of the work.



room with generator sets at right

Right—Fusion unit, drive bridle and part of oil emulsion unit



The electrolytic tinning line is essentially a continuous process which takes the tin plate in coil form from the cold rolling mills and after side trimming, cleaning and pickling, deposits tin on the strip electrically. Low-voltage generators (or rectifiers) supply direct current for depositing the tin on the steel from a cast-tin anode.

Like the continuous rolling mill, the continuous electroplating line must deliver a quality product at a relatively high speed and with a minimum of interruptions for adjustment or repair of equipment. One of the most important considerations is the accurate relationship which has to be established and maintained between the current density used in the plating bath and the speed with which the material is moved through it. Furthermore, to obtain the maximum production out of the equipment, it has been found that this speed must be maintained uniformly and at as high a value as is consistent with the handling of the product. These requirements have presented interesting problems from the standpoint of the synchronization and control of the many drives operating in tandem. All of the lines are using variable-voltage control for acceleration and speed control, and most of them require a rather complex current density control in terms of lineal speeds.

In a typical installation, the strip enters the tinning line from one or the other of two uncoilers which are used alternately. The operation of the line is expected to be such that when a new coil is welded on to the trailing end of a preceding coil, the line is first slowed down to a point which represents the

highest speed (in the neighborhood of 75 to 150 feet per minute) that can be maintained and still have the weld completed before the entire storage is removed from the loop.

In addition to the two uncoilers, the line includes the following units: seam welder, loop pit, roller guide, pin hole detector, gage rolls, drag bridle rolls, electrolytic pickler, multi-compartment plating tank, tin recovery system, steam dryer, reflow unit, drive bridle, weld cutout shear, roller leveler-flying shear, off-weight piler, branner, and final pilers.

The line operates in synchronism from 50 to 600 feet per minute by voltage control (50 feet per minute for setup purposes) and field control.

Speed Is Controlled

The main drive bridle is the master motor and its speed is under the control of a speed regulator operating on a motor-operated rheostat and itself having a vernier speed control. The center portion of the line between the entry drag bridle and the main drive bridle has the strip under tension. The tension at the entry drag bridle is under the control of a tension regulator. Since the speed range of the line is partially by voltage and partially by field control, this tension regulator for the entry drag bridle operates on a small 125-volt booster, so that irrespective of whether the line is operating on voltage control or field control, current in the armature of the entry drag bridle will indicate the same back tension.

The motor-operated rheostat, which controls the speed of the main drive bridle by voltage and field, actually controls the voltage of the generator to

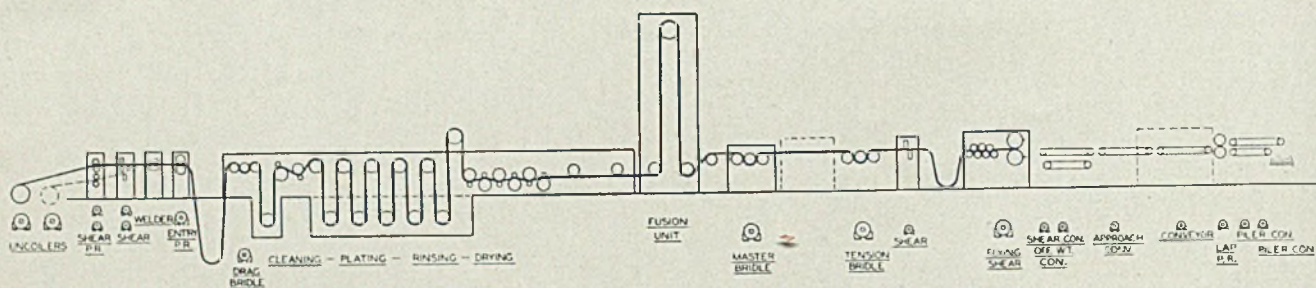
give voltage control and controls also the 5-kilowatt 175-volt counter EMF exciter. This counter EMF exciter will control the field strength to the main drive bridle, the flying shear motor and the lapping conveyor motors.

The matching of the entry pinch roll motor with the main drive bridle motor is of importance since this entry pinch roll must be able to overspeed the rest of the line to accumulate a loop in the pit. The tension between the uncoiler drag unit and the entry pinch roll is only of sufficient magnitude to prevent the coil from unwinding and to assist in decelerating the coil when the line is decelerated.

Tension regulators are being used to avoid the use of rider roll rheostats and to relieve the operator of any particular attention to this point. Each of these uncoiler drag units will pump into its own 250-volt 5-kilowatt generator whose field will be changed in proportion to the line speed.

The piler lapping pinch rolls must operate in synchronism with the flying shear to maintain good lapping for good piling. Flying shear and lapping pinch rolls therefore, are served by the same generator. Likewise, the lapping conveyors must match the flying shear motor characteristics, since these conveyors are carrying the sheets which have been satisfactorily lapped over each other for good piling, and for successful piling the degree of lapping is important. When necessary the operator can make vernier adjustments at this end of the line.

The branner drive and the two conveyors immediately preceding it are on their own separate generator. This is done since the action of a branner is not



Typical arrangement of equipment for electrolytic tinning line where reflow process (fusion unit) is part of one continuous operation

satisfactory at low speeds. The branner will actually run over a speed range of much narrower proportions than is true of the rest of the line. In fact, it is expected that the branner will never run below 100 feet per minute and in general its entire speed range will be covered by voltage control with a vernier field rheostat merely for setup purposes.

The current for the conductor rolls in the electrolytic bath is supplied from low-voltage generators or rectifiers. Because the amount of plating put on the strip is dependent upon time and current, an intricate and accurate current control system has had to be worked out to maintain the current density proportionate to speed.

A special galvanometer-operated instrument is used to control the field of the plating exciter. The instrument will have a "bridge circuit" in connection with a tachometer driven by the main drive bridle to obtain this interrelationship of plating current and speed. However, it has been arranged so that the value of current can be changed arbitrarily for any line speed to compensate for thickness of coating desired or width of strip being plated.

Three of the electroplating lines Reliance is equipping will use selenium rectifiers to supply the low-voltage, high-current plating requirements. Each rectifier bank has its own saturable core reactor for voltage control (20 to 1), and its own motor-driven blower for air circulation. The rectifier plates themselves are immersed in transformer oil and arranged in racks in a sheet metal enclosure. Each bank is equipped with thermoguards which operate in case of overheating.

Selenium rectifiers, while new in the United States, are old in Europe where some installations have been in success-

ful operation for as long as 15 years. A 20,000-ampere plating unit has been in service for four years in England on a continuous 24-hour basis with no loss in efficiency to date.

Electrolytic tinning line installed by the Bethlehem Steel Corp. at its Sparrows Point, Md. plant differs from some of the others in several particulars. The strip is rerolled in coil form after plating, instead of being sheared into squares. The electrolyte used is alkaline instead of acid. The reflow process is a separate operation which is performed separately. Moreover, the plating section of the line—the center section—is kept running at a constant speed without the necessity of accelerating or decelerating during the making of the weld and the cutout of the previous weld.

Storage Is Provided

Strip in coil form is pulled from one of two uncoilers through the welder by the entry pinch roll. Following this entry pinch roll and preceding the tanks is a looper, or accumulator, that provides storage of strip. This storage is available while the center portion of the line continues to run with the entry and stopped to weld the leading end of a new coil to the trailing end of the preceding one.

Similarly, at the delivery end of the line, there is a looper in which strip can be stored while the center portion of the line continues to run and the re-

coiler is stopped to change coils. Both the entry and delivery loopers automatically control themselves so as always to be in readiness for the stopping of the entry or the delivery ends of the lines.

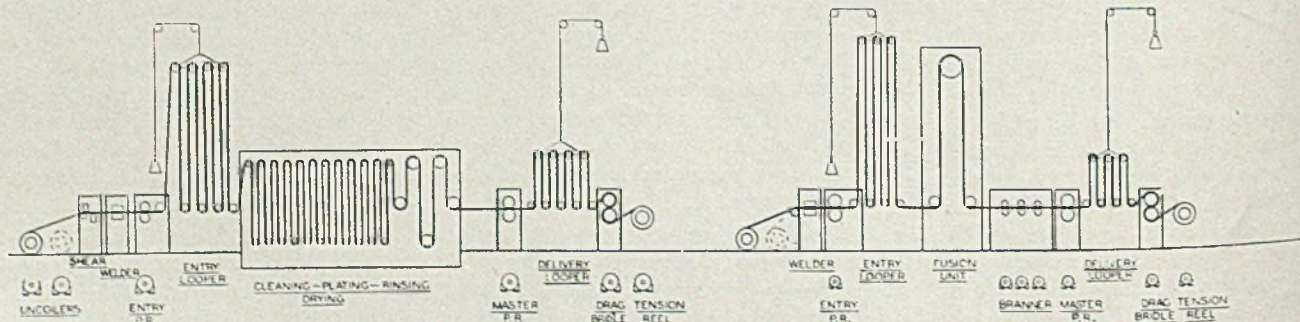
All of the electrolytic tinning lines that are being installed now will in all likelihood include some type or reflow unit as part of the operation. Those being built along the specifications developed by the Crown Cork & Seal Co., Baltimore, have reflow units as separate lines with generally two reflow lines for each tinning line.

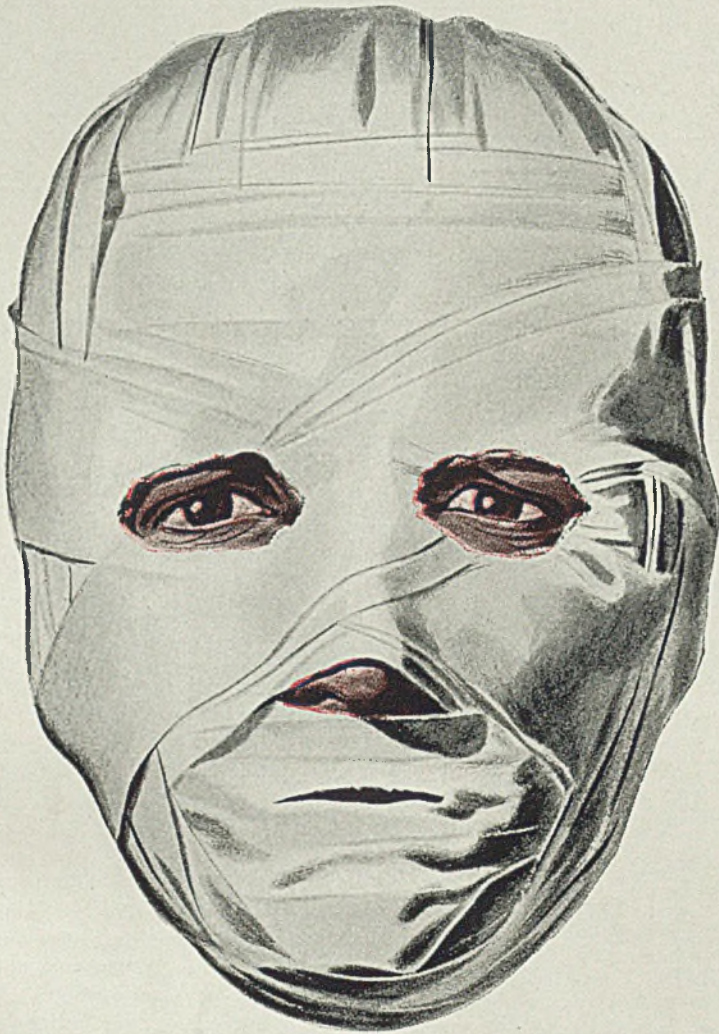
The reflow or brightening process is almost identical in operation with the tinning line itself. Differences are in speed of operation and the fact that there is a vertical heat muffle instead of an horizontal electrolyte tank. Individual elements are the same—entry pinch roll, entry loop, main pinch roll, delivery loop, drag unit and recoiler, variable-voltage generator sets, etc. The tin plate goes through in strip form and is rewound in coil form.

On both the electrolytic tinning and reflow lines, speed control and current or heat control with respect to speed are vital factors and must be handled accurately by a regulator control of special design.

All of the new electroplating lines will handle a continuous strip of about 31 gage in widths up to 36 inches. Initial speeds will range all the way from 200 feet per minute up to 650 feet per minute. Higher speeds are possible; in fact, the new lines in their initial try-outs have all easily reached a speed appreciably above the intended maximum, producing usable plate.

In this line loopers (accumulators) at entry and delivery ends provide enough stock to keep line going without interruption or slowdown for attaching or detaching new coils. Reflow process is set up as a separate line





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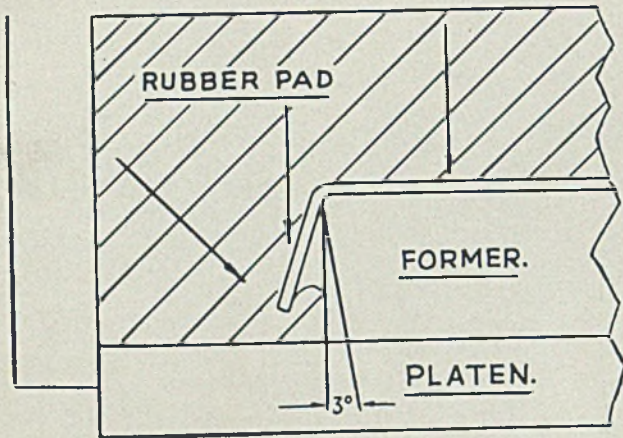
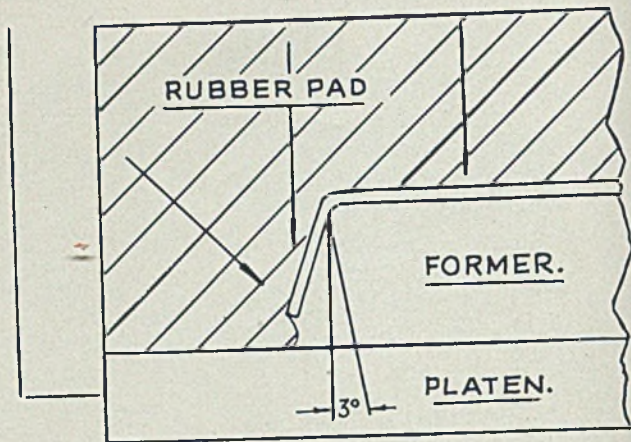


Fig. 1. (Left)—Diagram to illustrate how too soft a rubber prevents the flange from reaching the die because the rubber flows back in behind the flange.



Right, correct hardness is illustrated here. Less mobility of the rubber here allows flange to reach die. Note 3-degree backing off to correct for springback when pressure is released

PROPERTIES OF RUBBER

as used in

METAL DRAWING and PRESSING

RUBBER, as a medium by which metal sheet may be formed, is now, after some years of experience, firmly established. During the last few years, many articles have been written around the whole process, but these articles focus somewhat sharply upon the "mental" side of the job.

It is hoped to give here some new lines of thought and the extension of existing ideas, put in practical language and concentrated upon the *rubber* aspect. References will be made to the mechanical side, but let it be remembered that the target is "rubber". This article is written by a man in the manufacturing rubber trade who has been technically interested in this process since its earliest days.

All too often in the past the actual press operator or engineer has not been the man who came into direct contact with the rubber trade and such technical assistance as it was eager to offer.

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Thus an otherwise shrewd and energetic engineer or works manager, denied himself proper information and co-operation in the very heart of the process. Rubber is at least an equal partner in this process of drawing and pressing; the following remarks are, therefore, submitted as a collection of recorded observations to enable the metal worker to focus his attention on rubber in the operations of forming, drawing, blanking, piercing, flanging, bending and bulging.

Today, rubber is a closely protected material in very short supply and every care must be taken to secure not only economical design, but the longest possible life from every ounce. The main

usage, now under discussion, is concentrated in the aircraft manufacturing trade or similar essential types of work. However it is applicable to a wide variety of trades and articles other than aircraft construction. A small selection of articles would include metal ornaments, electrical trade pressings, household metal and hollow-ware, radio speaker chassis, cosmetic box novelties, engineers' special sundries and specialized toys.

The guiding principle will always be "economics". The prohibitive cost of original tools as compared with the number of articles for "run" is a governing factor; thus, if there are thousands of parts to be run, steel tools should be used; if there are only hundreds to be run the rubber matrix system is most

Fig. 2—These diagrams illustrate flanging operations done with the aid of a pressure retainer block. Note arrows show direction of advancing pressure

