



Navy veterans' combat experiences inspire steelworkers to increase daily tonnage. Page 108

STEEL

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NEWS

Anti-inflation Brakes Slipping	81		
<i>Increase steelworkers seek would cost more than industry's 1942 net</i>			
Present, Past and Pending	83	WPB-OPA	94
Surplus Materials	83	South America	104
Reconversion	84	Activities	105
Steel Statistics	86	Men of Industry	106
Postwar Planning	87	Obituaries	107
Pig Iron Allocation	89	Steel Campaign	108
Congress	92	Awards	111

TECHNICAL

How To Use Carbide Roller Turner Tools on Standard Lathe Work	114
<i>Factors governing design and setup for bar turning operations</i>	
Forged Seamless Tube Railway Axles Save up to 43% in Weight ...	116
<i>Pittsburgh Steel's process promises lower maintenance costs</i>	
Automatic Control of Electroplating Requires Special Planning ...	118
<i>Discussion of current practice, variables affecting quality</i>	
Accomplishments in NE Steel Specifications Brought Up to Date ...	122
<i>Industry advisory groups help assure success of projects</i>	
Hot Dip Lead Coating of Pole Line Hardware Conserves Zinc ...	127
<i>Effective methods minimize pin holes and superficial rust</i>	
User Report No. 22 on Experience with National Emergency Steels	132
<i>SAE grade replacements simplify aircraft materials problem</i>	
Tentative Method for Predicting Suitable Arc Welding Conditions ..	136
<i>Helps set up correct currents, speed, preheat for good welds</i>	
Plan To Operate New Blast Furnace Stack Under Top Pressure ...	141
<i>Unusual operation expected to show effect on smelting rate</i>	

FEATURES

As the Editor Views the News	77	Wing Tips	100
Postwar Previews	88	The Business Trend	112
Windows of Washington ...	90	Industrial Equipment	142
Mirrors of Motordom	97	Construction and Enterprise ..	196

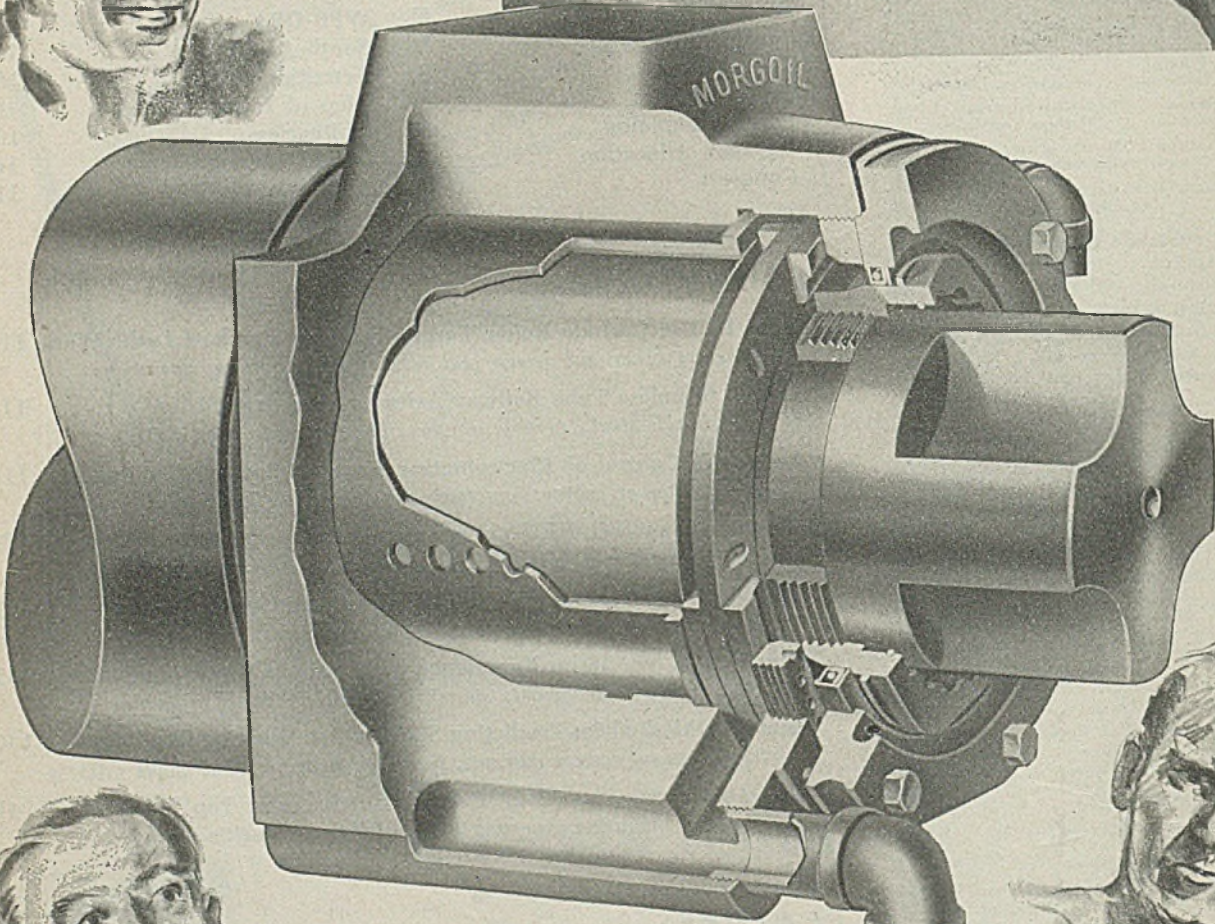
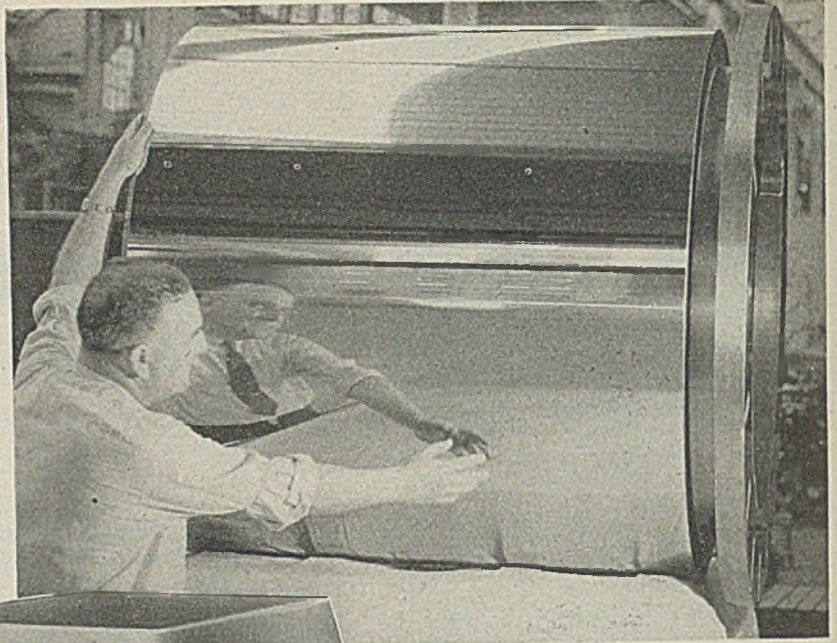
MARKETS

Plate, Sheet Buying Renewed; Deliveries Recede Further	175
Market Prices and Composites	176
Lull in West Coast Steel Demand as War Plants Are Finished	194
Index to Advertisers	205
<i>Where-To-Buy Products Index carried quarterly</i>	

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STEEL

The Right Man For The Job

Just when everybody was pretty sick and disgusted over the way the coal strike settlement was handled, word came from Washington that Economic Stabilizer James F. Byrnes, acting at the suggestion of President Roosevelt, had appointed Bernard Baruch director of a new "War and Postwar Adjustment Unit" in the Office of War Mobilization.

This news is tremendously important. It means that the job of developing unified programs and policies to govern all federal agencies during the remainder of the war and during the period of reconversion to peace has been placed in the hands of the most competent man available. It means that the confusion now existing among the various procurement organizations will be cleared away quickly. It means that a wise head will tackle the great problem of disposing of an estimated \$75,000,000,000 of government plant, equipment and supplies in an orderly manner.

Above all, it means that the job is in the hands of a man who knows industry and knows what a strong industry means to the economic well-being of the nation. Every American should be gratified that Mr. Baruch was available for this job, that he has accepted it, and that he already has started work on it.

Unfortunately Mr. Baruch, with all of his splendid qualifications for this task, cannot carry out the assignment single-handed. He will need the wholehearted cooperation of many departments and agencies of the government. He will need abundant authority. As an appointee of an official in the executive branch he is subject to all sorts of annoyances which plague office holders thus appointed. The welfare of the nation requires that Mr. Baruch's position be fortified against snipers of all kinds.

This can be done by congressional action. It is to be hoped that Mr. Baruch, after developing policies and methods, will submit recommendations to Congress for needed legislation. Once Congress has enacted satisfactory laws in accordance with the Baruch program, then the functioning of the machinery for war and postwar adjustment will have been removed from the uncertain status of a sub-executive directive.

Mr. Baruch's appointment came none too soon. He should have been appointed six months ago. As it is, he may not have time to do all that should be done. The least Congress can do is to be prompt in implementing Mr. Baruch's policies with the authority of law, as soon as they are ready.

LIGHTER RAILWAY AXLES: Pittsburgh Steel Co. has placed in operation a plant designed to produce 500 railway car axles per day from seamless tubing.

The significance of this development can be appreciated when it is realized that a tubular axle with 5 x 9-inch journals weighs 177 pounds less than a solid axle of same size and that the saving on an axle with 6½ x 12-inch journals is 510 pounds. On a four-axle car the weight reduction would range

from 708 to 2040 pounds, depending upon the size of axles.

The new tubular axles are forged from seamless tubing produced on a Pilger mill. Between wheel seats, the exterior surface of the axle is straight, instead of being tapered toward the center as in the case of a solid axle. The walls of the axle are thickest at the journals, are slightly thinner at the wheel seats and are thinnest between wheel seats.

This distribution of metal gives adequate strength

where needed at the same time that it permits a saving of from 25 to 43 per cent in the weight of steel. If this design proves satisfactory in every respect the ensuing shift to tubular axles will be as important an advance in car development as the change from the arch bar to the one-piece truck side frame which took place several decades ago.

—p. 116

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PLANT OBSOLESCENCE: High officials of General Motors Corp. have been visiting plants of the corporation in various sections of the country. Wherever they have gone, they have voiced optimism in regard to the postwar production of General Motors products.

Alfred P. Sloan, chairman, expects the national production of automobiles after the war will average 6,000,000 to 6,500,000 units for several years. He also predicts that the great reservoir of consumer purchasing power will insure a heavy demand for all kinds of goods—durable, semidurable and perishable.

Significant to many industrialists will be his stated belief that “from the standpoint of today’s technology, the greater part of the American industrial system is now obsolete and must be rebuilt.”

This is a thought-provoking statement, worthy of careful consideration.

—p. 97

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EFFECTIVE PSYCHOLOGY: About six months ago this writer had a talk with a chief petty officer of the Navy, who, with a gun crew, was visiting the plants of war contractors making parts for the gun. The C.P.O. and his crew had just returned from hair-raising experiences in the South Pacific. He was enthusiastic about his temporary assignment because he had found that immediately after his crew had visited a plant, production increased 10 or more per cent.

Recently the Navy has been conducting plant visitations on a more elaborate scale and with even more impressive results. At one steel plant, steel output increased 786 tons in the week following the visit of a crew of veteran Navy gunners. This was an increase of 12.8 per cent over the average output for the seven preceding weeks.

The basic idea is simple. Help the worker to visualize how his own work fits into the plan of war and he will respond.

—p. 108

LABOR'S BIG SACRIFICES: No distortion of fact attempted by the present government administration can come even close to matching the statement made by William H. Davis, chairman of the War Labor Board, in a letter to Vice President Wallace, dated Nov. 6. Wrote Chairman Davis: “As months flow by and the board continues to hold wages to the general level of Sept. 15, 1942, we become increasingly conscious of the fact that we are asking one segment of our society to do its part to protect all Americans from the ravages of inflation, while, at the same time, a similar obligation has not been placed as heavily upon the shoulders of some of the other segments of this society.”

This amazing attempt to infer that organized labor is making the greatest sacrifices met with such ridicule that Chairman Davis last Wednesday complained that his remarks had been misunderstood.

Years hence, when we view the labor mess in sane perspective, we will learn that the lone dissenter, Wayne L. Morse, was the only member of WLB who saw the coal wage agreement in its true, sinister light.

—p. 81

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ARMISTICE DAY, 1943: This is written on Armistice Day, 1943. Throughout the world, Allied forces are doing extremely well in the air, on land and on sea. The enemy is on the defensive and in Europe is beset by grave internal problems. Those in a position to weigh all factors say that anything can happen in the European theater.

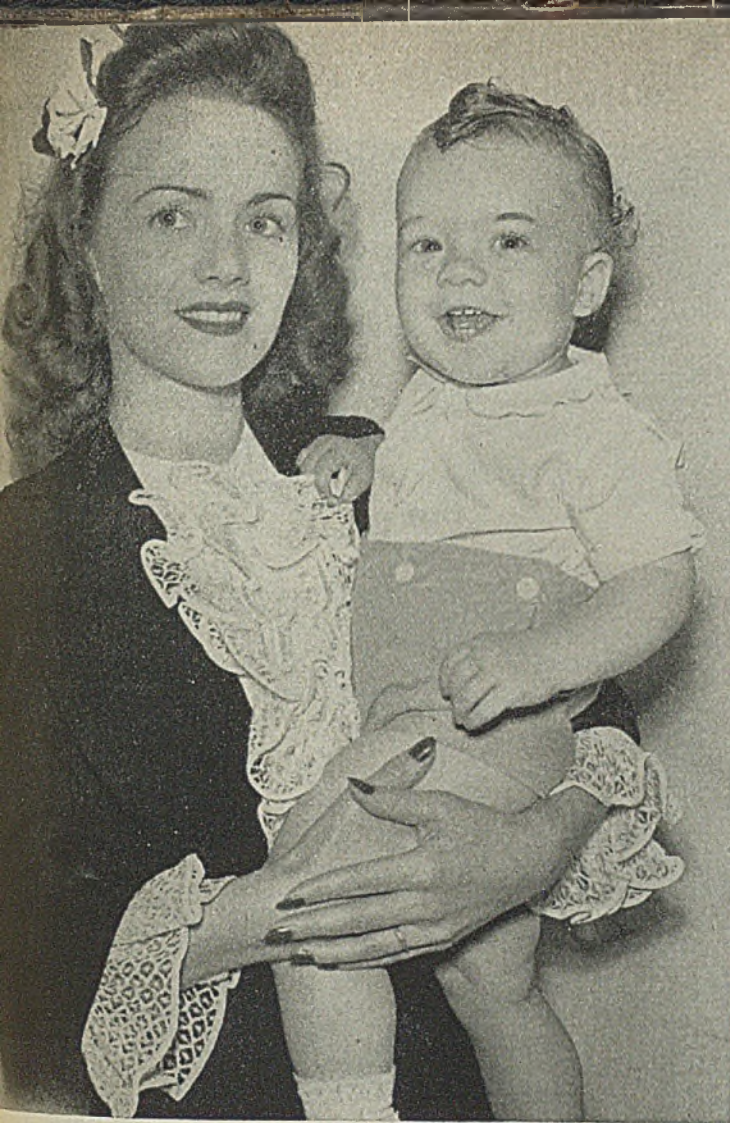
At home, production is at a high point in spite of disgraceful happenings, such as the coal strike. It could be higher and should be, because everything that can be done to shorten the war one day, one hour or one minute will save American lives.

Twenty-five years ago, 2000 men in the Allied forces lost their lives in battle on Armistice day. We wonder if the Pennsylvania miners who struck on Armistice day, 1943, because they were denied overtime pay, gave even a casual thought to the men abroad.

—p. 83

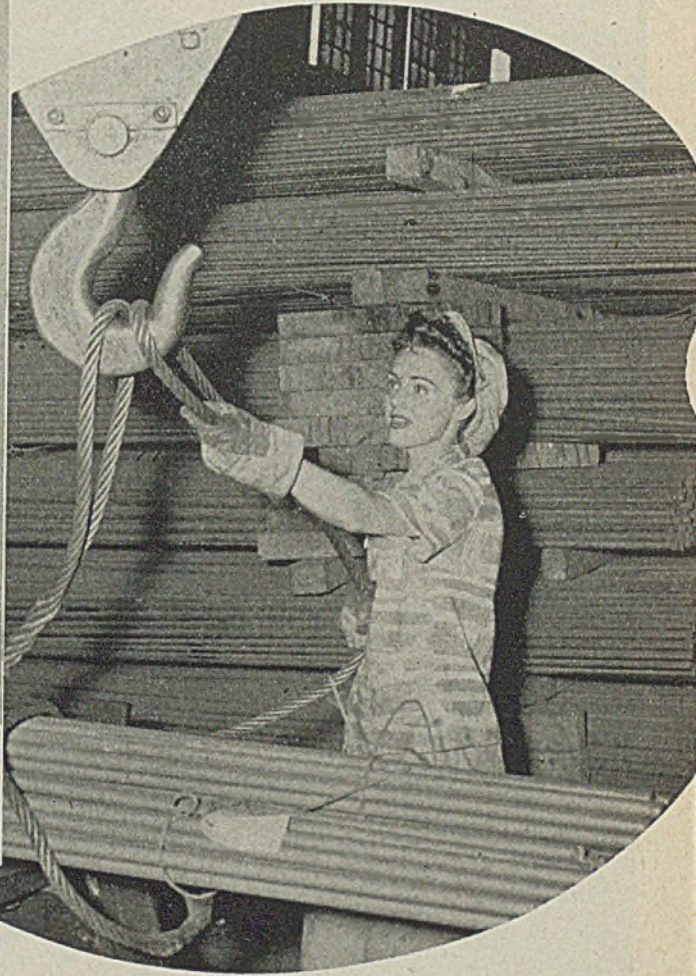


EDITOR-IN-CHIEF



Jimmy is anxious to see his Dad—his Mother is working for Victory.

Jimmy's Mother is now head of the crane hookers in one of the Inland departments.



Jimmy's Dad Fights, His Mother Works, To Help Bring Victory

Little Jimmy's Dad, Sgt. James C. Maloney, is doing his bit in an Air Force fighter squadron to win this war. Jimmy's mother is doing her bit, too, as head of the crane hookers in an Inland Steel Co. department.

Sergeant Maloney left Inland to enlist in September, 1940. Jimmy was only about five months old when his Mother, also a former Inland employe, returned to work. She wanted to do her part, along with Sergeant Maloney, to hasten the day when peace will return and Jimmy will see his Dad for the first time.

This little family story is typical of the American spirit for Victory—a spirit which moves men and women to do all in their power to help supply fighting equipment needed by America's fighting men to crush the enemies of Democracy.

Do you know a man, or woman, not now in war work—some person who can take a place in industry left vacant by a fighter? If so, urge him or her to join the ranks of war workers and hasten the day when Jimmy's Dad and all the other victorious Yanks will come marching home.



INLAND STEEL COMPANY

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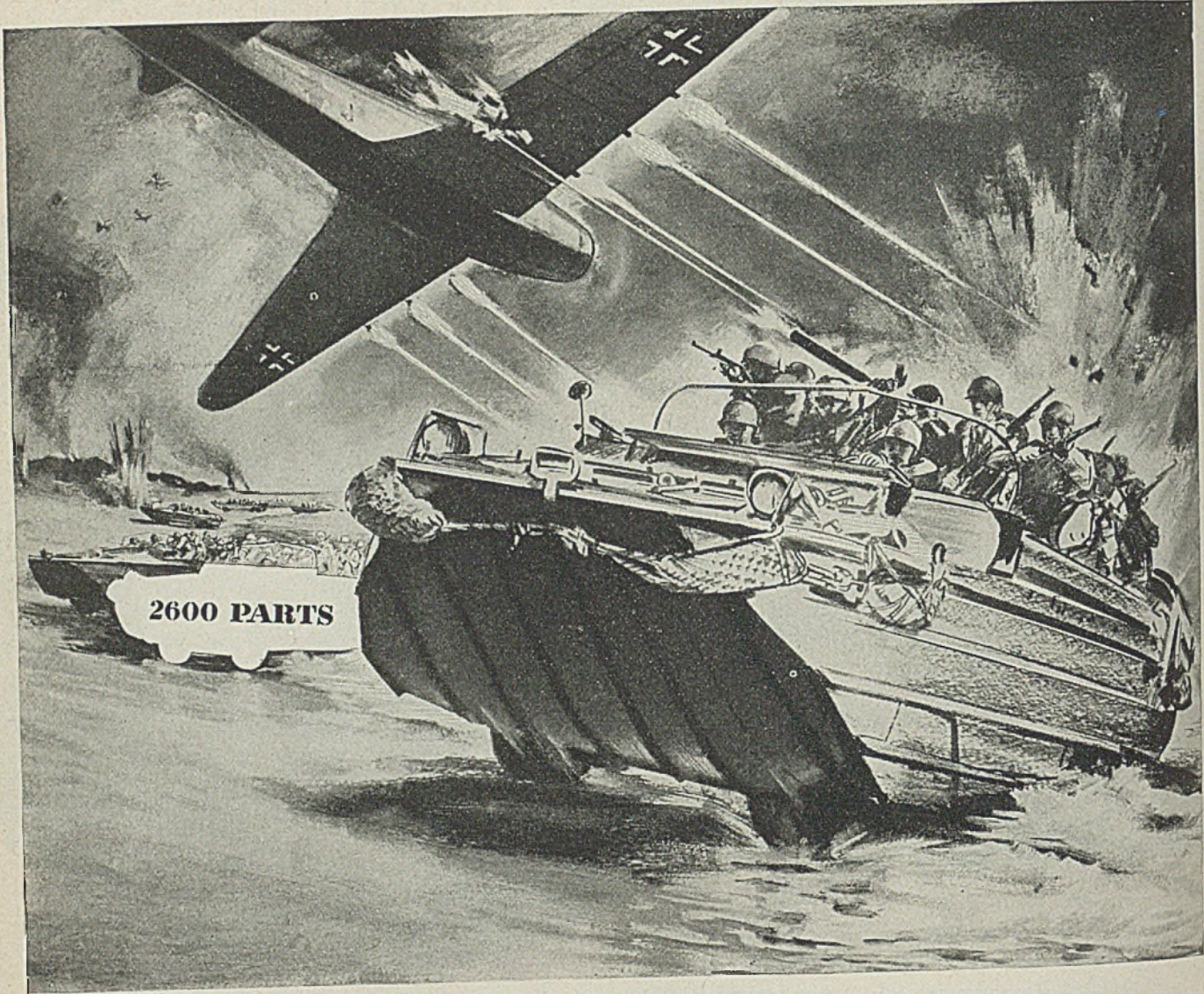
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Perhaps you helped to save the boys who

rode the Duck that day . . . Perhaps a few minutes' extra care some months ago, the time you took to check and double-check some tiny part, an extra thought you gave to better, faster machines and methods—helped keep that amphibian roaring on to victory . . . For—every part, down to the smallest, counts.

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STEEL

Anti-inflation Brakes Slipping

Increase asked by steelworkers would cost more than industry's total net earnings in 1942. Indicates open abandonment of WLB's wage stabilization formula

ORGANIZED labor in co-operation with the War Labor Board and other agencies of the national administration last week were evacuating the anti-inflation line.

The finger that was more or less effectually holding the dike was pulled out by the WLB and Fuel Administrator Ickes in granting a \$1.50 daily wage increase to soft coal miners.

Pent-up demands for other wage increases were quick to rush to the opening. Already pending were the railroad workers' requests. Encouraged by the mine workers' victory, nonoperating employes rejected a compromise increase of from 4 to 10 cents an hour and are continuing their strike balloting.

The flood that finally could wash out the "Little Steel" wage formula was set in motion by the Congress of Industrial Organizations. This group, meeting in Philadelphia and blessed by the participation of Mrs. Eleanor Roosevelt and Vice President Henry Wallace, announced it would demand a flat 15 cents an hour increase for members of the United Steelworkers of America, affecting 900,000 members, and open abandonment of the "Little Steel" formula. Employment in the basic steel industry at last count was 620,000.

Concurrently, William H. Davis, WLB chairman, issued two contradictory statements. In a letter to Mr. Wallace, he implied that organized labor had

made heavier sacrifices in the interests of stabilization than other groups. This had the effect of giving support to the demands of the United Steelworkers and other unions whose demands soon will be forthcoming.

This statement promptly was attacked by thoughtful observers and a few days later Mr. Davis attempted a reversal. He stated in a press conference that he was "widely misunderstood" and

Mrs. Eleanor Roosevelt confers with Philip Murray, president of the CIO, and Vice President Henry Wallace at the CIO convention in Philadelphia, where it was announced the United Steelworkers of America would demand the breaking of the "hold-the-line-against-inflation" policy by demanding a 15-cent hourly wage increase. Both Mrs. Roosevelt and Mr. Wallace were on the union convention program. NEA photo

that the WLB would attempt to hold wages at the Sept. 15, 1942, level. In view of his approval of the coal strike settlement and his letter to Mr. Wallace, Mr. Davis' second statement generally was considered only as adding confusion to confusion.

Another step backward was taken by President Roosevelt in appointing five members of the War Labor Board to study the cost of living index of the Labor Department to ascertain whether this index properly reflected changes in costs of essentials. This index for years has been compiled by supposedly expert statisticians of the Labor Department. That the WLB committee will find there has been an increase in living costs almost can be considered as a foregone conclusion, especially as Mr. Davis, WLB chairman, is chairman of the new committee. Other members of this committee are: George Meany, secretary-treasurer of the American Federation of Labor; R. J. Thomas, president of the United Automobile Workers-CIO; H. B. Horton, treasurer, Chicago Bridge & Iron Co.; and George K. Batt, vice president, Dugan Bros., Newark, N. J. The unionists long have contended that living costs have increased more than indicated by the index, and Mr. Davis' recent statements indicate he will side with the union members.

Actually the claims put forth by Mr.



WAGES

Davis and by the unions are not substantiated in figures.

While the cost of living has increased about 23 per cent since January, 1941, base period for the "Little Steel" formula, average weekly earnings of workers in manufacturing industries have increased by 50 per cent. Average hourly earnings advanced 33 per cent.

Nor do the figures show the steelworkers have much to complain about. Average hourly earnings are 34 per cent greater than in the base period, while weekly earnings are 55 per cent higher.

The wage increase they now are asking would cost the steel producing industry approximately \$225,000,000 a year, more than the producers' total net profits for 1942 of \$221,000,000. These additional wage costs would be superimposed on increased costs for coke which will be necessitated by the wage increase granted to soft coal miners. Last year the steel industry used more than 52,000,000 tons of coke. What the increase in the cost of coke will be has not yet been determined, although coal mine operators estimate the miners' wage increase will advance the cost of mining coal from 23 to 60 cents a ton.

These sharply increased costs make an advance in the price of steel products, frozen since April 17, 1941, almost inevitable. An increase in steel prices would touch off a demand for increases in the price of virtually every other commodity. As the Office of Price Ad-

STEELWORKERS' EARNINGS

	°Average Hourly Earnings	°Hours a Week	Average Weekly Earnings	†Cost of Living
1941				
Jan.	86.6	39.2	\$38.95	100.8
Feb.	86.9	39.4	34.24	100.8
March ...	87.7	38.5	33.81	101.2
April	97.1	39.4	38.26	102.2
May	98.1	39.7	38.95	102.9
June	99.2	38.2	37.89	104.6
July	99.1	37.8	37.46	105.3
Aug.	98.5	37.2	36.64	106.7
Sept.	98.2	37.8	37.22	108.1
Oct.	98.3	40.0	38.52	109.3
Nov.	99.0	37.6	37.22	110.2
Dec.	99.9	38.2	38.16	110.5
1942				
Jan.	99.2	39.2	38.89	112.0
Feb.	99.5	39.0	38.80	112.9
March ...	100.1	38.1	38.14	114.3
April	100.4	39.7	39.85	115.1
May	101.1	37.7	38.11	116.0
June	102.0	38.7	39.47	116.4
July	102.7	38.4	39.44	117.0
Aug.	104.1	37.6	39.14	117.5
Sept.	103.6	39.8	43.31	117.8
Oct.	107.7	39.9	42.97	119.0
Nov.	109.3	39.4	43.06	119.8
Dec.	109.4	40.2	43.97	120.4
1943				
Jan.	110.7	39.8	44.06	120.7
Feb.	110.5	41.6	45.97	121.0
March ...	110.3	42.2	46.55	122.8
April	111.2	42.5	47.26	124.1
May	113.4	41.9	47.51	125.1
June	112.7	43.3	48.79	124.8
July	115.4	43.5	50.24	123.0
Aug.	113.3	43.1	48.83	123.2
Sept.	116.0	45.3	52.55	123.7

°American Iron and Steel Institute †Index of United States Department of Labor.



War Labor Board members announce approval of contract between the government and the United Mine Workers, raising miners' pay \$1.50 a day and giving the inflation spiral a hefty fillip. Left to right: George W. Taylor, vice chairman; William H. Davis, chairman; Frank P. Graham. Standing is Wayne L. Morse, only member to dissent from the board's decision. NEA photo

ministration said in the order freezing steel prices:

"Steel is an element of cost in practically every item of the war program. It also is an element of cost, direct or indirect, in virtually every item of civilian consumption. The market place looks to the price of steel as a sheep looks to the bell-wether."

Obviously, the entire cost of the steel wage increase, if granted, would not be absorbed by the producing companies. A large share would be lost to the government through taxes.

Nevertheless, it is difficult to imagine how the steel industry can continue to absorb greater and greater costs without relief from the present prices.

Contradicting Mr. Davis' statement that organized labor has made greater sacrifices in the interests of stabilization than other groups, one has only to offer the record.

The steel producing industry, operating at practical capacity, in 1942 earned a net profit of \$221,000,000, or almost 50 per cent less than 1941 earnings of \$326,000,000.

It paid taxes in 1942 of \$776,000,000, against \$588,000,000 in 1941.

Its dividends in 1942 amounted to \$152,716,000, compared with \$166,000,000 in 1941.

Total payrolls, however, were \$2,176,000,000 in 1942, as compared with \$1,673,000,000 in 1941.

While it is conceivably possible the industry could absorb the proposed increased wage bill at capacity operations, a very definite and difficult problem is posed for the time when operations are reduced.

It is, of course, axiomatic that as steel operations rise, unit production costs decrease and vice versa. Thus a few years ago the "break-even" point in the producing industry was estimat-

ed at around 35 per cent. Later as wage and other costs increased the "break-even" point rose to 45 per cent, then to 55 per cent and so on until today the break-even point is only slightly below practical capacity.

In only five years from 1920 through 1940 did steel operations average more than 75 per cent, and capacity then was far less than now. Return to normal steel demand in the postwar era will bring serious problems to an industry saddled with wages such as the union now is demanding.

The drive by the United Steelworkers is admittedly only the start of a CIO campaign for similar wage increases for its other members. The automobile workers, the rubber workers and all others will place their demands as soon as the steelworkers' case is settled, if not sooner. And naturally AFL leaders will not be idle.

Confronted with what one government spokesman called "the worst threat of runaway inflation in history," the administration has opened a new campaign in behalf of a subsidy program.

Steel Payrolls Rise to New Peak in September

Steel industry payrolls reached a new peak of \$143,769,000 in September, a short month, according to the American Iron and Steel Institute. In August, payrolls were \$139,855,000.

Employment declined to 620,000, compared with 625,000 in August, and 640,000 in September, 1942.

Average hourly earnings also rose to a new high of \$1.16 an hour. In August, average earnings were \$1.133 an hour, and in September, 1942, \$1.086.

Average work-week in September was 45.3 hours.

Unified Disposal Policy Needed

Patman Committee continuing study of subject and hopes to make detailed report to Congress shortly. . . Senator George states immediate congressional action is desirable

EARLY action with respect to development of unified policy by the various government agencies in the disposal of surplus stocks and property is expected. Congress last week evinced considerable interest in the subject.

Sen. Walter F. George (Dem., Ga.) issued a statement to the effect government-owned surpluses already have reached proportions which make it necessary for Congress to take prompt action in establishing disposal policies and control.

Within recent weeks a hint of government surplus offerings to come was provided by a catalog of materials available from the Air Forces Specialized Depot at Memphis. (STEEL, Nov. 8, page 72).

In the absence of studies by other congressional committees on the control, disposition and sale of government-owned surplus property, the Patman Small Business Committee has decided to continue its investigations of this subject, and hopes to report in greater detail to congress in the near future.

This assurance is set forth in the committee's third interim report, which summarizes the committee's findings to date.

Certain Bills Pending

"There are now pending certain bills which, although relating to this subject, would have the net effect of postponing any affirmative action on this matter by the Congress for a period of as long as six months," the report states. "In the opinion of this committee the allotment of such a long period for the sole purpose of study and investigation of this subject is far too long an interval in which to keep industry, labor and the interested federal agencies in a state of uncertainty as to the ultimate wishes of Congress on this vital question.

"Furthermore, several sales of this type of property by the War Department under the terms of procurement regulation No. 7 have resulted in the property in question being sold without wide publicity to dealers in scrap and junk.

"It was generally agreed that an attempt should be made, as is now the case, to utilize surpluses within the (procurement) agency itself before other actions are taken leading to disposal of same. Failing that, other agencies should be given a refusal of the property. In the absence of any takers within the government, it was felt that sale should then be made to private industry, provided that any sale made should not be made in such a manner that existing businesses were harmfully affected in their own operations by such sale."

The report goes on to recommend

that one central board or person should be established through congressional action to "hold, manage, and dispose of all surplus property, subject to the recommendations of qualified representatives from the private industry group most directly affected by the particular transaction in question."

The committee holds that it is immediately incumbent upon congress "to establish a policy governing the ownership, management, and ultimate sale of these assets which will take into full

consideration the inherent rights and needs of the following groups or persons:

"1—The manufacturers who normally produce the product in question;

"2—The distribution firms which normally handle the sale of the product in question;

"3—The returning servicemen who will seek either employment or the means for establishing their own business enterprises after the war;

"4—The employees of firms now enjoying war business who may expect to be forced to seek other employment at the conclusion of the war;

"5—The taxpayers who will rightfully expect their government to realize as high a price as is possible, all other factors taken into consideration, for the products which the government will hold as surplus at the end of the war."

Present, Past and Pending

■ COAL MINERS STRIKE ON ARMISTICE DAY

PITTSBURGH—Wave of wildcat strikes occurred in western Pennsylvania coal fields on Armistice day, Nov. 11, as miners walked off the job in protest against a government order barring overtime pay for the holiday. Survey showed at least 16,290 men in 28 pits left their jobs feeling they should be paid time and one-half for working on the holiday.

■ EXPECT OPA TO GRANT PRICE INCREASE ON IRON ORE

WASHINGTON—Office of Price Administration is expected to grant a price increase of 20 cents a ton to iron ore producers, it is reported, applicable to both open pit and mine ore produced in the Lake Superior region.

■ FIRST QUARTER STEEL REQUIREMENTS EXCEED CAPACITY

WASHINGTON—First quarter steel allocations will be made Nov. 15. Requirements, though said to be below those of the fourth quarter, will exceed capacity by 25 per cent.

■ STEEL CASTING PRICING PROVISION EXTENDED

WASHINGTON—Adjustable pricing authorization, covering steel castings and railroad specialties, extended to Dec. 15.

■ KILN CHARCOAL IN BAGS PRICED AT \$40

WASHINGTON—Office of Price Administration has established \$40 a ton on kiln charcoal in bags, same as on bulk charcoal.

■ RESTRICTIONS ON USE OF STEEL EASED FURTHER

WASHINGTON—Restrictions were removed last week on use of steel in production of hooks and eyes, snap fasteners, and brassiere hooks made in any part of the country other than labor market areas 1 and 2. Ban on the production of slide fasteners of more than 27 inches in length for civilian use also lifted.

■ WILL PERMIT CIVILIAN GOODS PRODUCTION

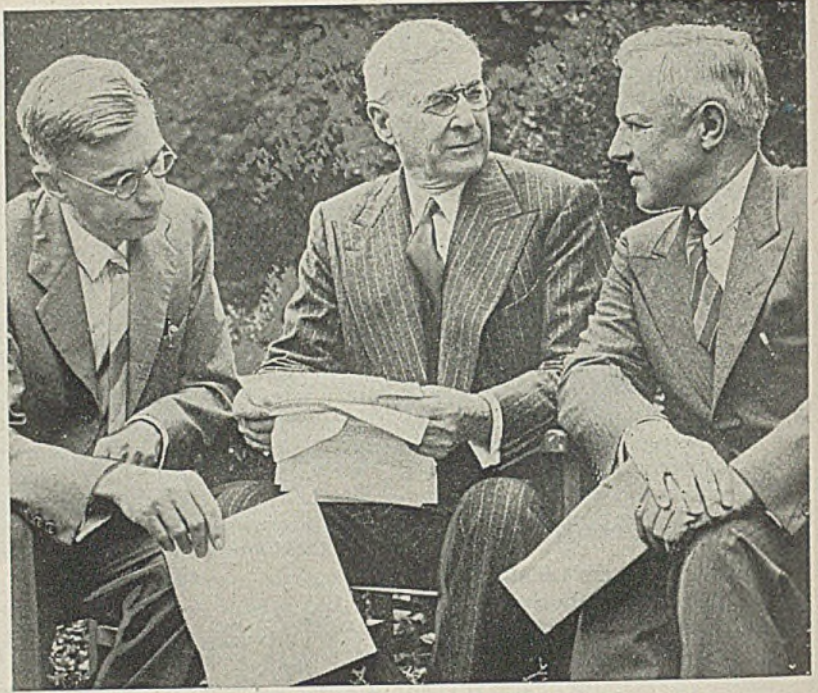
WASHINGTON—Congressional committee was assured by WPB Chairman Nelson last week production of essential civilian goods will be permitted on an increasing scale as fast as military requirements allow the release of war plants and vital materials.

■ STRIKE CUTS STEEL PRODUCTION

BUFFALO—Approximately 15,000 tons of steel ingots was lost as the result of a six-day strike by 375 blooming mill workers at the Republic Steel Corp.'s local plant which kept approximately 2300 workers idle and stopped all steel production last week. One of two blast furnaces was banked.

Baruch Starts Promptly on New Chore

As director of War and Postwar Adjustment Unit in OWM, immediately moves to develop uniform contract termination policy



Bernard M. Baruch, center, head of the new unit in the Office of War Mobilization for dealing with war and postwar adjustment problems, in his favorite office, a Washington park bench. Here he is conferring with Dr. James Conant, president of Harvard University, and Dr. Karl Compton, president of Massachusetts Institute of Technology. NEA photo

ONE of the most important postwar planning moves to date is appointment of Bernard M. Baruch, elder statesman, advisor to the President, and chairman of the War Industries Board in World War I, as director of a new "War and Postwar Adjustment Unit" in the Office of War Mobilization.

At the suggestion of President Roosevelt, Mr. Baruch was named to the post by Economic Stabilizer James F. Byrnes.

As usual, Mr. Baruch lost no time in undertaking his new chore, which is that of developing unified programs and policies to govern all federal agencies during the remainder of the war period and during the period of reconversion to peace. His first move was to call a meeting, last Tuesday, of representatives of all government procurement agencies with the objective of establishing a uniform contract termination policy. Mr. Baruch already is well advanced in his ideas about contract termination procedure; in his report on manpower problems last August he recommended a uniform contract termination procedure to relieve industry of "peace jitters."

At this meeting last week with representatives of the procurement agencies Mr. Baruch discussed differences in their contract termination policies preparatory to ironing them out and establishing uniform procedure.

President Roosevelt explained that while Baruch will work out uniform policy, actual administration of the policy would be left to the agencies. Baruch is expected to ask Congress for needed legislation.

The study of contract termination procedure automatically paves the way for a frontal attack on the other major associated problems, those involving disposition of government-owned plants and surpluses and reconversion of plants shutting down or slowing down on war production.

In his announcement Mr. Byrnes said that "the first adjustments which would demand the attention of Mr. Baruch and his unit would be adjustments rendered necessary not by the cessation of hostilities but by the changing requirements of our war strategy. Such reshaping of our war programs must be carried through with a view to increasing the effectiveness of our war effort."

In a sense, Mr. Baruch's unit replaces the defunct National Resources Planning Board, excepting that it is expected to study all factors in the economic system and report to the administration. It is expected to go much farther, however, in making positive and definite recommendations. It was a committee headed by Mr. Baruch, it will be recalled, that issued a report that paved the way to clearing up the synthetic rubber mess.

Nelson Enlightens Senate Group

Donald M. Nelson, chairman of the War Production Board, last week told the Murray subcommittee of the Senate Military Affairs Committee that termination, reconversion and disposition of surpluses must be considered together, not separately, and that in his opinion legislation is needed to implement procedure as well as to give confidence to industry. He said the government must assume responsibility for taking care of subcontractors although settlements should be made through prime contractors. He advocated establishment of field tribunals to which subcontractors could appeal settlements proposed by primes. These would handle all matters of equity. He

advocated government loans to contractors for reconversion, not on the basis of their credit position but on the basis of their efficiency and production records and on their potential value to the economy. He also advocated legislation under which dismissal wages would be included as charges against the government.

The matter of contract termination policy now is in a bad state of confusion. Whereas all the procurement agencies worked out termination and cutback procedure with the purpose of making quick cash settlements, they took alarm when Comptroller General Lindsay Warren, who carries much influence with Congress, charged the War Department exceeded its legal authority in making termination settlements, and advocated that settlements should be subject to final audit by the General Accounting Office. Since then, there has been a lot of study of the subject by a number of congressional committees and subcommittees but without any indications of early action. It is quite likely Mr. Baruch's recommendations will prove of much help in shaping legislation that will smooth up the process of settling canceled contracts.

That the situation already is serious is proved by a statement by Sen. James E. Murray (Dem., Mon.) on Nov. 3. As a result of a study he had asked the War Production Board to make, it was shown that of 1548 claims made upon the War Department by terminated contractors, only 608 had been settled, the remaining claims coming to an aggregate of about \$270,000,000. It was shown that most of the claims are from

small manufacturers, and come to less than \$50,000 each. It also was shown that one-third of the still pending claims have been in the hands of the War Department for more than six months. These statistics make no allowance for claims of other procurement agencies.

Not only are the procurement agencies fearful as to their legal authority to make settlements that are final and binding, but there are major differences between the termination clauses of the War Department, the Navy Department, the Maritime Commission and the clause proposed by the War Production Board. The nature of the settlement agreement, therefore, varies in accordance with the rules of the particular procurement agency with which the contractor deals.

Experts on the staff of the Subcommittee on War Contract Termination of the Senate Military Affairs explained these differences as follows in a statement issued last week:

Various Departments' Formulas Differ

"The War Department formula gives the contractor the contract price for completed articles, the cost of work in process and of termination, and an allowance for profit on work in process. The formulas of the other procurement agencies give the contractor, in effect, the same recovery with respect to completed articles and cost of work in process and of termination, but the allowance for profit on work in process is different. The Navy clause gives the contractor a sum to be negotiated between the parties at the time of termination but not less than 1½ per cent and not more than 6 per cent of the work in process. It provides no clue as to what would happen if agreement could not be reached. The Maritime Commission clause gives the contractor a percentage of the cost of work in process and a different percentage of the cost of unworked material bought for the contract, these percentages being negotiated between parties at the time of entering into contract.

"The proposed WPB clause gives the contractor the option to select between a formula like the War Department formula and another quite similar formula. The second formula, instead of giving a contractor the contract price for completed articles and costs and an allowance for profit for the uncompleted articles, gives him all the costs of the contract plus an allowance for profit. This profit is based on an estimate of the profit which would have been earned over the entire contract if it had been completed, to which is applied the percentage of completion of the entire contract period. The second alternative offered by the WPB clause eliminates the necessity of allocating costs between the completed and the uncompleted portion of the contract and also automatically adjusts for cases where the initial unit cost of production was higher than the later ones.

"The treatment of payments clause provides for reimbursement of such pay-

ments only where the payments are made with the prior written approval of the contracting officer. This is true with respect to all such payments, small and large. The Maritime Commission clause also requires that payments in connection with termination of subcontracts must be approved. The Navy Department clause does not require such approval.

"The WPB clause requires prior approval or subsequent ratification of the contracting officer only in connection with settlements of \$10,000 or more.

"Neither the War nor the Navy Department formulas indicate any stand-

tions, if the interest of the government is properly protected. It is not known, at this time, what the practice or attitude of the Navy Department and Maritime Commission is on this extremely important question.

"All the clauses used by the procurement agencies are vague as to the time when material on hand for production under the contract is to be transferred to the government.

"The War and Navy Department clauses apparently assume that complete directions as to the transfer or retention of property by the contractor will be included in the notice of termination. Since, as a practical matter, this will be entirely impossible in most cases, there is no time limit within which directions need be given. The Maritime Commission clause clearly sets no time limit for the vesting of title.

"The WPB clause provides a catch-all arrangement, under which property automatically vests in the government 60 days after submission of an inventory by the contractor, unless the contracting officer has otherwise directed in the meantime.

"The clauses differ as to the time when termination may be effective. Under the War Department and the Maritime Commission clauses, termination may be effective as soon as the termination notice is received. Under the Navy Department clause it cannot be effective until ten days after receipt of the termination notice.

Termination Effective Immediately

"The WPB clause provides that termination may be effective immediately upon receipt of the notice and work must be stopped as promptly as practicable, but may be continued up to 15 days if necessary to avoid injury to the plant, materials or work in process."

In the above comparison the clauses referred to are: War Production Board, Draft of Regulation Submitted to Procurement Policy Board, Sept. 22, 1943, as revised Sept. 24, 1943; War Department, Clause prescribed by War Department Procurement Regulations, paragraph 324; Navy Department Bureau of Supplies and Accounts, Clause marked 1707-P. S. C. Alt. No. 2,8-6-43; United States Maritime Commission, Standard Termination Clause, approved by the Commission, Oct. 12, 1943.

As this is written, prevailing congressional sentiment on the subject of contract termination is about as follows:

- 1—Termination procedure should be uniform for all procurement agencies;
- 2—Termination should be under the complete direction of one central agency;
- 3—This agency should have a strong and definite mandate from Congress;
- 4—Termination must be speedy, to enable contractors and subcontractors to stay solvent, and the law must make adequate provision for adequate advance payments and for guaranteeing loans where necessary.

PLAY BIG ROLE

More than four million tons, or about one-third of America's record-breaking 1943 production of alloy steels, will consist of the low-alloy group known as the National Emergency or NE steels, the American Iron and Steel Institute estimates.

Created in 1941 to stretch the supply of critical alloy metals, these "lean" NE steels have now reached an estimated annual tonnage of 4,250,000 in two years' time.

Conversion of this much alloy steel production from standard types to the NE series is expected to save the nation 24,000 tons of nickel. The nickel saving will be accomplished at the cost of no increase in the use of chromium and with rises of only 3000 tons for molybdenum and 8000 tons for manganese.

ards which might be applied in granting or withholding approval of a proposed subcontract settlement. The Maritime Commission clause is somewhat more explicit in allowing, as a cost, amounts paid to a subcontractor pursuant to a termination clause like the Maritime Commission's termination clause, or pursuant to another termination clause if it gets the commission's approval.

"The WPB clause provides that settlements on subcontracts are binding on the government if made in good faith and not in excess of the higher of two amounts: (1) the amount recoverable at common law and (2) the amount recoverable under proposed termination provisions for subcontracts.

"None of the clauses used by the procurement agencies indicate to what extent certain controversial items of cost will be allowed; e.g., special obsolescence resulting from termination of the contract or cessation of war production.

"The WPB clause specifically sets forth, as a part of the contract, the practice which the War Department has established by its regulations. It allows such obsolescence under appropriate condi-

October Ingots Set New Record

Exceed prior high mark of March by 100,000 tons. . . Rate of operation touches best level of war period

STEEL ingot output in October exceeded all prior records with total output of 7,786,359 net tons, in spite of some loss of production caused by coal strikes, it was announced last week by the American Iron and Steel Institute.

October output exceeds by more than 100,000 tons the previous peak of 7,670,187 tons reached in March, mainly because of new furnaces placed in operation since the earlier month. By an even wider margin the October total exceeded the peak 1942 production of 7,579,514 tons in October last year. In September, 1943, production was 7,488,978 tons.

During October the steel industry operated at an average of 100.8 per cent of capacity, highest yet achieved during the war period. In September, operations averaged 100.4 per cent and in October, 1942, they were 100 per cent.

Average weekly production in October was 1,757,643 tons, compared with 1,749,761 tons per week in September and 1,710,951 tons weekly in October, 1942. In March, when the previous high was reached, the weekly average was 1,731,419 tons.

Steel Corp. Shipments Highest Since December

Shipments of finished steel products by the United States Steel Corp. in October totaled 1,794,968 net tons, an increase of 130,391 tons over September shipments of 1,664,577 tons, and 7467 tons greater than shipments in October, 1942, which were 1,787,501 tons.

For ten months ended Oct. 31, aggregate shipments were 16,864,612 tons, compared with 17,548,977 tons in the comparable period of 1942.

(Inter-company shipments not included)				
	Net Tons			
	1943	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	1,660,762	1,765,749	1,666,667	1,296,887
Aug.	1,704,289	1,788,650	1,753,665	1,455,604
Sept.	1,664,577	1,703,570	1,664,227	1,392,838
Oct.	1,794,968	1,787,501	1,851,279	1,572,408
10 mo.	16,864,612	17,548,977	16,988,715	12,006,135
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	*449,020	*42,333	†37,639	
Total	20,615,137	20,416,604	15,013,749	

†Increase. *Decrease.

U. S. STEEL INGOT STATISTICS

	—Open Hearth—				Estimated Production—All Companies—				Calculated weekly production, all of companies Net tons	Number of weeks in mo.
	Net tons	Per cent of capac.	Net tons	Per cent of capac.	—Bessemer—	—Electric—	—Total—	Per cent of capac.		
Based on reports by companies which in 1942 made 98.3% of the open hearth, 100% of the bessemer and 87.6% of the electric ingot and steel for castings production										
Jan.	6,576,589	97.8	478,058	85.9	369,390	95.4	7,424,042	96.8	1,675,856	4.43
Feb.	6,033,674	99.3	447,843	89.1	344,532	98.6	6,826,049	98.5	1,706,512	4.00
March	6,785,295	100.9	503,673	90.5	381,219	98.5	7,670,187	100.0	1,731,419	4.43
1st qtr.	19,395,558	99.3	1,429,574	88.4	1,095,146	97.5	21,920,278	98.4	1,704,532	12.86
April	6,509,812	99.9	481,810	89.4	382,532	102.1	7,374,154	99.3	1,718,917	4.29
May	6,664,298	99.1	483,024	86.8	398,057	102.9	7,545,379	98.4	1,703,246	4.43
June	6,188,837	95.0	453,399	84.1	384,645	102.6	7,027,101	94.6	1,638,019	4.29
2nd qtr.	19,362,967	98.0	1,418,433	86.7	1,165,234	102.5	21,946,634	97.4	1,686,905	13.01
1st hlf.	38,758,525	98.7	2,848,007	87.6	2,260,380	100.0	43,866,912	97.9	1,695,667	25.87
July	6,516,387	96.2	466,288	90.6	393,342	94.0	7,376,017	95.7	1,668,782	4.42
Aug.	6,669,944	98.3	484,957	94.0	407,224	97.1	7,562,125	97.9	1,707,026	4.43
Sept.	6,617,102	100.9	480,635	96.4	391,241	96.6	7,488,978	100.4	1,749,761	4.28
3rd qtr.	19,803,433	98.5	1,431,880	93.6	1,191,807	95.9	22,427,120	98.0	1,708,082	13.13
9 mos.	58,561,958	98.6	4,279,887	89.5	3,452,187	98.5	66,294,032	97.9	1,699,847	39.00
Oct.	6,839,051	101.1	513,521	99.5	413,787	98.7	7,786,359	100.8	1,757,643	4.43
Based on reports by companies which in 1942 made 98.3% of the open hearth, 100% of the bessemer and 87.6% of the electric ingot and steel for castings production										
1942										
Jan.	6,322,215	95.3	490,874	86.0	299,017	94.2	7,112,106	94.5	1,605,442	4.43
Feb.	5,785,918	96.6	453,549	88.0	273,068	95.2	6,512,535	95.9	1,628,134	4.00
March	6,572,930	99.0	493,191	86.4	325,990	102.7	7,392,111	98.2	1,668,648	4.43
1st qtr.	18,681,063	97.0	1,437,614	86.7	898,075	97.4	21,016,752	96.2	1,634,273	12.86
April	6,345,133	98.7	454,834	82.2	321,324	104.5	7,121,291	97.7	1,659,975	4.29
May	6,595,440	99.4	453,938	79.5	333,200	104.9	7,382,578	98.1	1,666,496	4.43
June	6,239,674	97.1	452,528	81.8	323,100	105.1	7,015,302	96.3	1,635,269	4.29
2nd qtr.	19,180,247	98.4	1,361,300	81.2	977,624	104.8	21,519,171	97.4	1,654,049	13.01
1st hlf.	37,861,310	97.7	2,798,914	83.9	1,675,699	101.1	42,535,923	96.8	1,644,218	25.87
July	6,345,315	95.7	453,686	79.6	345,957	96.6	7,144,958	94.5	1,616,506	4.42
Aug.	6,414,637	96.5	467,293	81.8	345,725	96.3	7,227,655	95.4	1,631,525	4.43
Sept.	6,286,855	97.9	437,961	79.4	332,703	95.9	7,057,519	96.4	1,648,953	4.28
3rd qtr.	19,046,807	96.7	1,358,940	80.3	1,024,385	96.3	21,430,132	95.4	1,632,150	13.13
9 mos.	56,908,117	97.3	4,157,854	82.7	2,900,084	99.4	63,966,055	96.3	1,640,155	39.00
Oct.	6,750,829	101.5	461,897	80.9	366,788	102.2	7,579,514	100.0	1,710,951	4.43
Nov.	6,371,750	99.0	458,469	82.9	349,593	100.5	7,179,812	97.8	1,673,616	4.29
Dec.	6,471,261	97.6	475,204	83.4	358,075	100.0	7,304,540	96.6	1,652,611	4.42
4th qtr.	19,593,840	99.4	1,395,570	82.4	1,074,456	100.9	22,063,866	98.2	1,679,137	13.14
2nd hlf.	38,640,647	98.0	2,754,510	81.3	2,098,841	98.6	43,493,998	96.8	1,655,653	26.27
Total	76,501,957	97.9	5,553,424	82.6	3,974,540	99.8	86,029,921	96.8	1,649,979	52.14

The percentages of capacity operated in the first 6 months of 1942 are calculated on weekly capacities of 1,498,029 net tons open hearth, 128,911 net tons bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942, as follows: Open hearth 78,107,260 net tons, bessemer 6,721,400 net tons, electric 3,737,510 net tons. Beginning July 1, 1942, the percentages of capacity operated are calculated on weekly capacities of 1,500,714 net tons open hearth, 128,911 net tons bessemer and 81,049 net tons electric ingots and steel for castings, total 1,710,674 net tons; based on annual capacities as follows: Open hearth 78,247,230 net tons, bessemer 6,721,400 net tons, electric 4,225,890 net tons. The percentages of capacity operated in first six months of 1943 are calculated on weekly capacities of 1,518,621 net tons open hearth, 125,681 net tons bessemer and 87,360 net tons electric ingots and steel for castings, total 1,731,662 net tons; based on annual capacities as of January 1, 1943 as follows: Open hearth 79,180,880 net tons, bessemer 6,553,000 net tons, electric 4,554,980 net tons. Beginning July 1, 1943, the percentages of capacity operated are calculated on weekly capacities of 1,531,789 net tons open hearth, 116,494 net tons bessemer and 94,667 net tons electric ingots and steel for castings, total 1,742,950 net tons; based on annual capacities as follows: Open hearth 79,867,460 net tons, bessemer 6,074,000 net tons, electric 4,935,960 net tons. Data from American Iron and Steel Institute.

Industry Plans Now for Johnny's Return When Its Over, Over There

THE boys who went away to war are coming back when it's all over, over there, but they're not going to be the same fellows who left their desks, machines, or benches. Employers know this and they are giving a lot of thought to the problem they will face in fitting these veterans into industry from which they have been absent for many months.

Many of the men in the armed services are being given an excellent course in specialized technical training. Clearly the employer who fails to take advantage of the skills acquired by these boys in the service would be missing a bet. Furthermore, these fellows are getting a much broader outlook and experience which will better equip them to perform their assigned roles in industry.

Taking a look at the program of one company may give an insight into the problem confronted by employers. The same conditions face both large and small firms, the only difference being the size of the problem. The program of a medium-sized company would seem to fit the needs of the majority of businesses. About a year and a half ago, management of Oliver Iron & Steel Corp., Pittsburgh, began to develop a plan of action. In common with other companies, it had spent time and money training workers and the departure of many of these was, still is, a distinct loss. Because the company felt it had a stake in these men and because the men likewise felt they wanted to return to the company after the war, a definite program to maintain contact

Truman Report Hits Army WPA

Committee takes slap at Under Secretary of War Patterson's statement soldiers should be held in service until jobs in industry are found for them

WITHOUT mentioning him by name, the Senate's Truman committee has taken a slap at Under Secretary of War Robert P. Patterson for his recent testimony before the House Patman Committee on Small Business that soldiers should not be released from the Army until jobs have been found for them.

In a report dealing with postwar planning, the Truman committee criticized "predictions by Army officials" that soldiers would not be released until industry has jobs for them and that war contracts would be continued pending re-conversion of war plants.

"The Congress has never authorized either the War or Navy Departments to provide a new Work Project Administration by forcing soldiers or sailors to re-

main in the Army or Navy, or by permitting the production of war goods for which there is no military use," the report said.

"The Congress did not vote billions of dollars of appropriations to the War and Navy Departments for such purposes as these, and the job which the Army and Navy did in peacetime planning for wartime needs does not support a conclusion that they should be allowed to determine the conditions under which peacetime business is to be operated. This is not a military function."

The report said that in preparing for our own postwar prosperity consideration should be given to seeking some repayment from the British for lend-lease

(Please turn to Page 192)

with the selectees was established.

Briefly, the program starts as follows: When the employe becomes established in the armed forces, Theodore F. Smith, president, writes him a letter. This is followed with a carton of cigarettes as a token that the company hasn't forgotten him. The company then sends a photographer to the employe's home. Pictures of all members of the family are forwarded to the boy in camp, together with a letter from his immediate supervisor back on the job. Copies of the employe paper are sent regularly to all former employes, and every effort is made to encourage correspondence. All letters the men write are answered immediately by the man to whom the letter is addressed, whether he is the president of the company or a fellow worker. Many of the letters received from fighting men are published in the company paper.

The whole program is designed to keep contact between the former employe and the company. It is the first of three important steps which comprise the general plan.

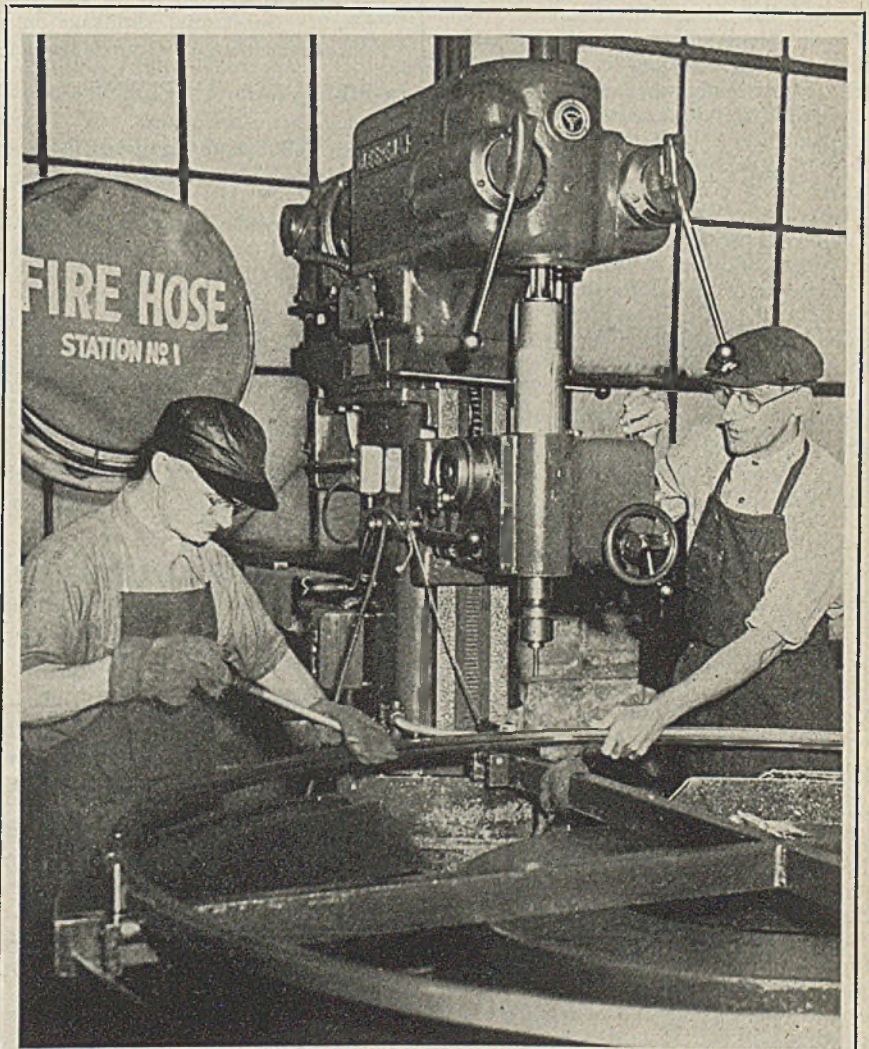
The second step is assembling of personal information about the employe since he has left the company. This is done by the personnel department, and comes mainly from letters written by the man to the company. His army training, his experience, where he was located—all these are gathered so that the personnel department will be better able to evaluate his worth when he returns, and place him in a job where he will be able to do the best work for himself and for the company. In some cases, latent talent unsuspected by his former supervisors may come to light, while in others army training may make him a much greater asset to the company after the war, either through giving him responsibility as an officer or by technical training.

Company Formulates Postwar Plans

The third step in the plan is the overall postwar plan of the company, which will insure jobs for these men when they return. Part of the company has been converted to war work, part remains on prewar items which are useful in the war effort. Plans are being carefully laid, including introduction of new products, improvement in existing products, new manufacturing techniques designed to cut costs, and studies of work completely different from the plant's activities before the war. This planning has reached a stage where it is ready to go as soon as conditions warrant, and it is already detailed enough so it will assure a minimum of lost time in changing over from war to peace production.

The Oliver management is confident the plan will pay dividends. It will pay not only in money, but in better employe relations and in more production per man.

Recent statements by the National Association of Manufacturers indicate there will be about 1,000,000 men returning from the armed forces next year.



BLIND WORKERS: These two men, Frank Webber, right, totally blind, and his helper, George Frank, with partial vision in one eye only, equal the output of normal teams in operating a drill press at the plant of the American Welding & Mfg. Co., Warren, O.

Anglo-American Mission's World Tour Completed

Group makes recommendations aimed at co-ordinating distribution and effecting efficient use of materials

AFTER a five-month globe-circling tour of some 48,000 miles, an Anglo-American mission has completed a special survey of steel production and use in several of the dominions, in India and in the Middle East.

The Combined Steel Committee, headed by Operations Vice Chairman H. G. Batcheller, was established to obtain information on steel production and requirements of the United Nations for the combined boards and to consider means of improving efficiency of distribution and the use of steel.

"It is imputed," Mr. Batcheller said, "that with information obtained from the various dominions and India it will be possible for the combined boards to complete the Allied Nations' balance sheet of steel production and requirements."

The mission consisted of Sir John M. Duncanson, controller of the British Iron and Steel Control, and Earl A. Emerson, president of Armco International Corp., Middletown, O. They were accompanied by Norman Anderson of the British Iron and Steel Control and Capt. Alexander H. Gaal of the A. U. S. Visits were made to New Zealand, Australia, India, South Africa and the Middle East. The report also covered Southern Rhodesia.

The report draws attention to the progress already made in empire countries in surveying the control of steel. Four recommendations were made to the combine steel committee:

1. That there be established in the United Kingdom an organization to co-ordinate information on British and American steel controls, and to circulate such information among the dominions.

2. That dominions should be asked to advise this co-ordinating body of savings they have been able to make, the methods used to be considered for adoption by the United States and the United Kingdom.

3. That careful study be made of any further surplus capacity arising in the dominions, so that one dominion might supply more of the requirements of another.

4. That when the standardization of controls is completed, all possible steps be taken to facilitate action on the requirements submitted by the various dominions to the United States and the United Kingdom.

POSTWAR PREVIEW

WAGES—Present rates plus increases now demanded by unionists will pose critical problem to steel producing industry when operations return to peacetime levels. See page 81.

SURPLUS MATERIALS—Unified program for disposal of government-owned surpluses sought by Patman Small Business Committee. See page 83.

RECONVERSION—Bernard Baruch, now the administration's top postwar planner, seeks to establish uniform contract termination policy. See page 84.

DEMOBILIZATION—Truman committee attacks Army's suggestion that servicemen be retained in armed forces until jobs for them are available in private industry. See page 87.

AUTOMOBILES—General Motors Chairman Sloan forecasts production of six million cars annually for three or four years after reconversion of the industry from war work. Cites huge accumulated demand for consumer goods. See page 97.

EMPLOYMENT—No. 1 postwar problem for industrialists will be to find maximum number of jobs for returning soldiers and workers in war plants. Substantial shrinkage in present level of industrial production throughout country thought inevitable. See page 97.

POSTWAR AIRPLANE—Air-minded youngsters building "flapping wing" airplane models. W. B. Stout, interested in the ornithopter, has gone so far as to rig up a wing and motor unit for tests. "Flapping wing" airplanes still far from anything approaching practical stage. See page 97.

JEEPS—Size, cost and performance of car of future thought likely to be influenced by performance of the "jeep." Designers and engineers impressed with the possibilities of a small, light-weight vehicle. See page 98.

NOISE ABATEMENT—New sound-deadening material known as Vibration developed by United States Rubber Co. has postwar possibilities. May alleviate effects of noise and vibration on ears of airplane crews. May have applications in other than airplane field. Made of asbestos and other nonstrategic materials. See page 98.

CUTTING TOOL—Use of double-end cutting tool in machining insides of molds results in man-hour savings. Output of machined molds per operator doubled. See page 98.

SYNTHETIC RUBBER—Uskol is new type synthetic rubber developed by U. S. Rubber Co. Said to offer new high degree of assistance to solvents; can be vulcanized. Also can be blended with other synthetics. See page 98.

ROLLER TURNER TOOLS—Among newer types of carbide cutting tools which have significance for the postwar period are the "roller turner" tools intended for use with standard turret lates, being specifically planned for turning operations on bar stock. See page 114.

TUBULAR RAILWAY AXLES—Development in railway car axles has implications for the postwar railway field. Replacement of solid steel axles with axles of forged seamless tubing estimated by railroad officials to save from \$12 to \$18 per ton per car per year in cost of hauling non-paying weight. Reduction in usurping weight, as much as 43 per cent, expected to effect substantial savings in maintenance. See page 116.

WELDING GUIDE—Newly introduced scheme which enables accurate predetermination of arc-welding currents, speeds and preheats without lengthy preliminary tests seen as contributing to postwar production efficiency. Production of a weld joint retaining desired ductility in the base metal is said to be assured. See page 136.

Allocations May Be Suspended As Supplies Become Easier

WPB officials and industry advisers study effects of coal strike on production before reaching final decision. . . Capacity considerably increased since beginning of war program. . . High cost furnaces pose problem

NEW YORK

SUSPENSION of pig iron allocations is expected within the next few weeks, or as soon as it is possible to evaluate the effects of the recent coal strike on production.

For some time, pig iron and some other products have been under review by the War Production Board, looking toward possible revision of overall policy. A few weeks ago it was believed likely that a decision in regard to pig iron allocations might be reached by the middle of November, but interruptions due to the coal strike may delay the action.

WPB officials and industry advisers will consider the issue this week. However, even if a decision is reached, it is believed unlikely that suspension of al-

locations would become effective before the first of the year. Applications for December iron already have been made.

Ending of allocations would not mean the freeing of iron from all limitations because WPB undoubtedly would continue to restrict consumption to war products and 'essential civilian items, although the latter category probably would be broadened.

Among various considerations involved in the lifting of allocations are the positions of furnaces whose costs have influenced Office of Price Administration to permit them to quote premium prices and the politics which might be involved in the cases of certain nonintegrated furnaces being built with government funds in localities where their very existence depends on their ability to ship

iron relatively long distances and whose positions normally would be considered uneconomic.

Recently, reports from various parts of the country have indicated the spread between monthly requests and actual pig iron allocations has been narrowing, with overall war requirements being met with little difficulty. Capacity production and the advent of new and enlarged blast furnaces have contributed to easier supply conditions. Additional blast furnace capacity, blown in since the start of the war program or scheduled to blow in the near future, is listed in the accompanying table.

In the New England area it is reported the threat of a pinch in pig iron supplies has long since passed. Production of the Everett furnace, distributed through Metals Reserve Co., accounts for roughly half the melt in the district, the balance coming from Buffalo district furnaces; several of the latter are reported piling iron. The Everett product is selling at a premium, consumers absorbing \$2 a ton above the market while an additional \$1 is taken up by MRC. Conjecture is rife as to the continuance of distribution of higher cost iron in view of the easier supply at Buffalo, selling at the lower prices.

Recently, production of pig iron has been hampered by the shortage of coke resulting from the coal strike. It is the intention of the government, however, to press output to the limit. Reports that production was being held down at some points have been denied by government authorities.

Scrap Collection Campaign Falls Far Short of Goal

The autumn scrap collection campaign has fallen far short of its goal, a survey by STEEL's editors reveals. The drive was launched Oct. 1 and was scheduled to end Nov. 15.

Collections in many districts were little more than 10 per cent of quotas. This is attributed to the fact that last year's drive drained households of accumulated scrap and that labor and transportation facilities shortages prohibit gathering of farm scrap.

In Saginaw, Mich., for example, an Army cavalcade of 26 trucks, supplemented by 219 private trucks manned by 1000 volunteer workers, spent a full day scouring farms and homes of the county. The result was a collection of only 400 tons, compared with 4000 tons brought in a year ago.

In New York city, collections in four boroughs totaled only 387 tons of all metals, against a city quota of 2900 tons. Brooklyn produced 118 tons, against a quota of 1000 tons; the Bronx turned in 49 tons, with a quota of 400 tons; Richmond collected 50 tons with a quota of 200.

In Pittsburgh, the drive was called a complete failure. No increase in volume moving to mills was noted.

NEW BLAST FURNACE CAPACITY SINCE START OF WAR PROGRAM

FURNACE	CAPACITY (tons)	REMARKS
American Rolling Mill Co. Ashland, Ky.	Bellefonte 430,000	Blown in—Aug. 20, 1942
Sheffield Steel Corp. Houston, Tex.	245,300	Due—Dec., 1943
Bethlehem Steel Co. Bethlehem, Pa.	C 432,000	Blown in—July 1, 1943
Lackawanna, N. Y.	C 432,000	Blown in—July 18, 1943
Sparrow's Pt.	H 432,000	Blown in—Nov. 23, 1941
Colorado Fuel & Iron Corp. Pueblo, Colo.	G 432,000	Blown in—Oct. 10, 1941
Inland Steel Co. Indiana Harbor, Ind.	F 225,800	Blown in—Jan. 29, 1942
National Steel Corp. Weirton Steel Co. Weirton, W. Va.	6 7 8 419,350	Blown in—Nov. 16, 1942 Due—Nov., 1943 Due—June, 1944
Kaiser Co. Fontana, Calif.	3 431,400	Blown in—Dec. 25, 1941 Blown in—Jan., 1943
Koppers United Coke Granite City, Ill.	A* B* 193,550 233,850	Blown in—Jan. 16, 1943 Blown in—Sept. 15, 1941
Lone Star Steel Co. Daingerfield, Tex.	399,850	Due—Dec., 1943
Pittsburgh Steel Co. Monessen, Pa.	3 432,100	Due—Jan., 1944
Republic Steel Corp. Cleveland	5 450,250	Blown in—Oct. 28, 1943
Gadsden, Ala.	2 280,350	Blown in—May 28, 1942
So. Chicago, Ill.	450,250	Due—Jan., 1944
Youngstown, O.	6 392,000	Blown in—Oct. 12, 1942
United States Steel Corp. American Steel & Wire Co. Duluth, Minn.	2* 259,400	(moved from Joliet) Blown in—Feb. 24, 1943
Carnegie-Illinois Steel Corp. Braddock, Pa.	B C 430,100 430,100	Blown in—July, 1943 Due—Nov. 15, 1943
Columbia Steel Co. Provo, Utah	2* 299,700	(moved from Joliet) Blown in—Jan. 16, 1943
Geneva Steel Co. Geneva, Utah	2 3 4 383,500 383,500 383,500	Due—Jan., 1944 Due—Jan., 1944 Due—Jan., 1944
Tennessee Coal, Iron & RR Co. Fairfield, Ala.	7 353,450	Blown in—May 1, 1942

*Rehabilitated.

WINDOWS of WASHINGTON

Patents Under Fire

SUBCOMMITTEE on War Mobilization of the Senate Military Affairs Committee has become the sounding board of the Department of Justice in its campaign against cartels and to gain control of the American patent system. Appointed to study S. 702, a bill to mobilize the scientific and technical and research resources of the nation and to establish an Office of Scientific and Technical Mobilization, the original aim was understood as one of helping small businesses by making available to them the results of research work which they could not afford to obtain through their own organizations; the idea was that the big corporations who can afford extensive research work have too great an edge over the small companies. Trend of the testimony developed by Wendell Berge, assistant attorney general, indicates the hearings are tending toward charges against large corporations. He said titanium has been priced exorbitantly because of monopolistic control by a world cartel. He said American members of the cartel, National Lead, du Pont and Tutan Co. Inc., were placed in a position where they felt obliged to help the Japanese evade the British embargo, and have seen fit to aid I. G. Farben of Germany in attempting to prevent seizure of German-owned patents by the Alien Property Custodian.

Big Resurgence

Two months ago it was believed that the peak demand for industrial heating and heat treating furnaces had been passed, and that production from then on would dwindle rapidly. Instead, there has been a big resurgence in demand for furnaces of numerous types, particularly for preheating forging bars and billets. A large amount of this business is coming from Russia but a large portion also is domestic.

Fast Work

Removal of rivets from wrecked airplanes has been speeded 300 per cent by use of a "de-riveter" developed by a civilian employe of the AAF Training Command, Scott Field, Ill. It is a regular rivet hammer with a small cold chisel welded to the shank of the rivet punch. It is welded onto the rivet set so as to have the proper shank for insertion in the gun.

No Repeal

Tax hearings by the full House Ways and Means Committee interrupted the work of the Disney subcommittee regarding revision of the Contracts Renegotiation act. The subcommittee up to last week agreed that the act would not be repealed; that contractors should be able to appeal for relief when they consider renegotiation unfair; that renegotiation will be limited to contracts of \$500,000 or more; that some costs allowed in computation of taxes should be

allowed in renegotiation; that full amortization deduction, particularly under five-year amortization plans be allowed as costs; that excessive salaries will not be allowed as cost items.

Regional Consultants

To provide engineering aid for increased war production, the Management Consultant division of the War Production Board now has a management consultant in each regional office as well as a Washington staff. These

SCARED TO DEATH

How does it feel to bear the responsibility of spending billions of government money? Navy Secretary Knox answered this question at a hearing of a House subcommittee on appropriations as follows:

"The funds you have made available to the Navy in large amounts, frankly, scare me to death. I regard them as a trust fund and, believe you me, I have made the fellows, when they come to me and want to make expenditures of those particular funds, make the most complete justification before they get them; because I expect to be held accountable for the expenditure of those funds and I want every penny justified by darn good reasons."

Here's how he feels about the national debt:

"I am thoroughly alarmed at the size of the debt and I confess my own economic education has not progressed sufficiently for me to find the answers to how you are going to meet it all; also that consciousness is associated in my mind with the knowledge that you cannot stop this war and you cannot impair your effectiveness in the war just because it is going to cost money. We had better spend every damn cent and lick our enemies than to try to save something and be licked by them. So that you are between the horns of the dilemma. I am terribly alarmed; I am nonplused as to how it is to be met; yet, at the same time, I am conscious that we have to win the war."

consultants are men who have had practical supervisory experience in the application of industrial engineering practices such as wage payment plans, job evaluation, time and motion study techniques, production control, wage incentive plans and so on. They also have been selected because of an understanding of the labor point of view. They work in close collaboration with the Office of Labor Production. Their services may be had on request.

Cheap Wrist Watches

The Ordnance department is endeavoring to develop a "dollar wrist watch" which will give satisfactory performance to millions of men in the armed services who do not need the fine watches of split-second accuracy that are required by men in the front lines, who must be at a certain place at a definite moment in order not to get caught in their supporting artillery barrages. Because of the tremendous demand for jeweled watches, there is a shortage of personnel capable of repairing and maintaining them in the field.

Strategy

Strategy of Republican members of the House Ways and Means Committee in opposing the income tax increases recommended by the Treasury Department is to force the administration to change its attitude toward a retail sales tax. They want the administration to acquiesce, if not sponsor, a move for a sales tax. That would offend labor leaders.

Big Jump

Aircraft Production Board, representing both the Army and Navy, reports triple-alloy National Emergency steels now are being used in 75 per cent of all possible applications in aircraft construction. This is a gain of about 100 per cent as compared with six months ago when aircraft parts manufacturers were less certain than now about what they could do with NE steels.

Curtain Raiser

As a curtain raiser in an effort to get favorable action on S. 1243 and H. R. 3209, bills that would authorize the Bureau of Mines to spend \$30,000,000 in erecting and operating a plant of commercial size for manufacturing synthetic gasoline by hydrogenation of coal, and to install apparatus required for the reclamation of by-products of coal, Chairman Jennings Randolph (Dem., W. Va.) of a House subcommittee on mines and mining flew 175 miles in an airplane from Morgantown, W. Va., to the National Airport at Washington on Nov. 6, using as fuel synthetic gasoline produced from coal at the Pittsburgh Experimental Station of the bureau. Mr. Randolph is sponsor of the bill favoring a synthetic gasoline plant.

Minimum Standards

A move is under way by the War Production Board in conjunction with the Dimensional Gage Industry Advisory Committee to establish minimum standards of accuracy for all standard dimensional gages. The committee is expected to submit a report and recommend standards before the end of November. Purpose is to guard this industry against encroachment by the "10-cent-store" trade.



The bird that is its own mother!

THE FABLED PHOENIX lives for 500 years. At the end of that time, it builds itself a nest in the branches of an oak or the top of a palm tree. After the funeral pyre is complete with cinnamon, spikenard and myrrh, the phoenix sets the nest on fire and burns itself alive.

From its body, or its ashes, a young phoenix issues forth, destined to live another 500 years. When it is strong enough, it carries the nest—its own cradle and its parent's coffin—to the temple of the Sun.

We think the modern parallel to this story is even more interesting, because it's true! Did you know that machine tools are the mothers of machines? They are the only things made by man that can reproduce themselves. And it's fortunate for us they can, because

machine tools are a measure of the degree of civilization of a country.

Machine tools are the foundation of all modern industrial production. They are not only essential for the manufacture of every class of engine and kind of mechanism, but every manufactured product—metal goods, textiles, foodstuffs, scientific instruments, building materials—all must be built on machine tools or on a machine constructed with their help!

In the post-war era, Cone Multiple Spindle Automatic Lathes will be even more essential than they are now. Their unique advantages of departmentalized control will be available to industry to help bring us all better living than we have ever known before.

CONE Automatic Machine Company, Inc., Windsor, Vermont

House Probers Get Lowdown on De Lorenzo, Brewster's "Bad Boy"

Union leader, described as master mind behind "hellish labor contract," at committee hearing into production failure at airplane plant, admits to untruths and use of aliases. . . Attributes labor difficulties to management policies

AT HEARINGS to establish the reasons for the lamentable performance of the Brewster Aeronautical Corp. in producing military aircraft, the Drewry subcommittee of the House Naval Affairs Committee heard one witness after another place a large share of the blame on Thomas V. De Lorenzo, president, Local 365, UAW-CIO, the union which has a contract with Brewster. He had been termed everything from a "smart cookie" to a "dictator," and the master mind behind a "hellish labor contract."

De Lorenzo was described as a shrewd, hard-driving labor leader of whom a great deal more will be heard in the future. When he took the stand, the members of the subcommittee were well prepared to take him apart and see what makes him tick. Because he is regarded as typical of many labor leaders now in the ascendency, many congressmen who are not committee members were in attendance. Hence, it is more than likely that the facts brought out in this hearing may have a bearing upon future labor legislation.

Under merciless questioning a peculiar dual personality emerged. On the one hand there was the De Lorenzo who is fanatically a believer in his union and who would gladly die for it; he gave a strong account to justify his conduct as the union president. On the other hand there was the De Lorenzo who at various times went under half a dozen or so aliases and who never hesitated to lie or swear to false statements when it suited his purposes to do so.

It was proved that about the only true statement in his application for employment with Brewster was his social security number. In it he falsely claimed to have been an airplane riveter and assembler. He gave his birthday as Aug. 17, 1902, whereas, he actually was born on March 20, 1909.

He told his draft board falsely that he had worked as an aircraft assembler from 1937 to 1939 and from 1935 to 1937 as a riveter, explaining, "I had gone so far that I couldn't seem to get away from it."

When he swore to the truth of statements made to Selective Service in applying for a position on a War Labor Board panel he claimed his parents had been born in this country and that he had never been arrested. Rep. F. Edward Hebert (Dem., La.), forced him to admit his father had been born in Poland and his mother in Austria. Also, that he had been arrested once,

and indicted for vehicular homicide, once for inciting to riot, and that he had had 15 charges of traffic violations on most of which he had paid fines.

Hebert brought out how he had been born in a squalid part of Brooklyn and how he had fought his way in the streets and how he had continued to fight until now he heads his union. He brought out that whereas the witness was born Harry Posner he had used numerous aliases and finally had his name legally changed to Thomas Vincent De Lorenzo. On one occasion he had impersonated another Brewster employe, Sidney Taurig. Pressed for the reason for this he was embarrassed and, upon being assured by Mr. Drewry he must reply or be liable to fine and imprisonment, he consented to whisper the answer to the committee.

He frequently got tangled up in his testimony. At one time, asked to explain why he adopted the legal name of Thomas Vincent De Lorenzo, he said he had gotten it out of a telephone book because it "sounded pretty." Later he explained his sister was studying Italian at college and was going under the name "De Lorenzo—so we all started to use it."

Used Wrong Name

He filed a 1940 income return in the name of Harry Posner, stating himself to be a salesman, whereas legally he then was De Lorenzo and had been working as a Brewster employe. "I used the name Posner," he said, "because I had started something I couldn't get out of. But I filed the correct amount of my income and certainly had no fraud in mind."

Some of these untruths he blamed on lawyers who filled out forms which he signed without reading them. In other cases he did it because he "just felt that way."

Hebert questioned De Lorenzo about the effort the latter made at the recent CIO convention in Buffalo to get that organization to rescind its wartime no-strike pledge. "Does that mean that you believe in striking during time of war?" asked Mr. Hebert.

"I do not believe in strikes during the war," answered De Lorenzo, but I do believe in the right to threaten to strike. That increases the union's bargaining power."

"Do you mean that abandonment of the no-strike pledge would put the union in a better position to deliver a mandate

to the Commander-in-Chief to bargain with it for concession?" asked Hebert.

"I've seen Congress bargain with the President," retorted De Lorenzo.

"Congress let us down by failing to keep prices down," he added. "We would be satisfied without wage gains if the cost of living were kept pegged down."

Under questioning by Chairman Patrick H. Drewry (Dem., Va.), De Lorenzo stoutly maintained that strikes and slowdowns at no time interfered with production at Brewster plants.

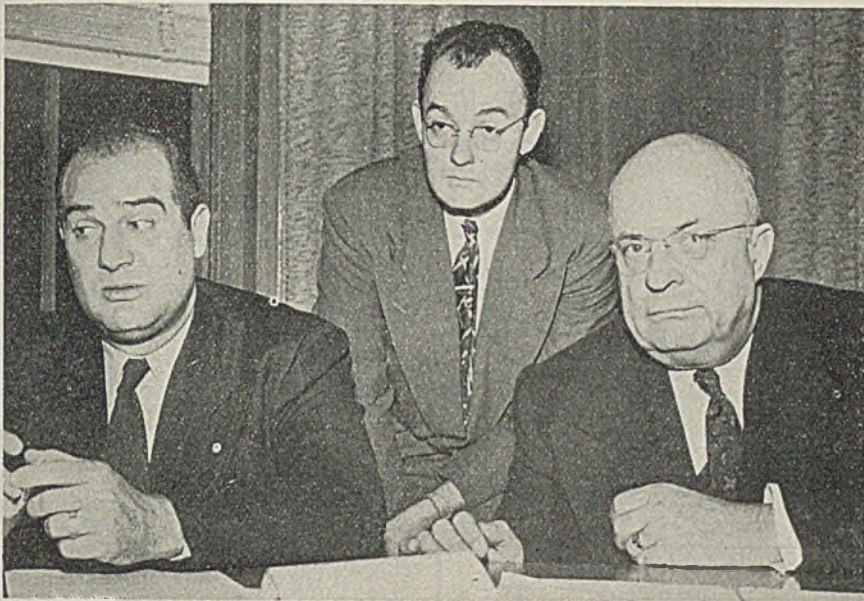
"There never was a time," he said, "when the plants were operating at more than one-third of capacity. Men were begging for work. They could do in two hours what they were having to do in ten." Principal reasons, he said, were six model changes in three years, changes in management, production layout and failure of the management to furnish materials and parts where and when needed.

He was sharp in his criticism of the two managements the Navy installed at Brewster, those headed by C. A. Van Duzen and Frederick J. Riebel Jr. Instead of attending to their real job, that of production, these managements aimed principally at "breaking the union," he said. Questioned in detail about the issues involved in the various strikes and slowdowns, he declared that the union never broke any of the contract provisions until after management had taken the lead in violating them. Management again and again delayed in carrying out promises and in many instances broke its promises. De Lorenzo said he was forced to take an interest in Brewster labor union affairs because of the difficulty of getting fair treatment from the management. There were two unions, one CIO and the other AFL, at the time, and so as not to get caught in the middle he joined both. That put him in a good position when the CIO union became the bargaining agent.

When he started work at \$22 a week back in 1939, he was held to that level for an indefinite period instead of getting a promised increase after he had qualified as an assembly worker. He was put off month after month. The slowdown in December of 1942, he said, resulted from an order that men were not to do work outside of their classifications.

"We had waited for 15 months for the management to carry out a promise to reclassify the workers—it meant a raise from 62 cents an hour for helpers to 77 cents for the qualified workers. Finally, Van Duzen repudiated his word by throwing the whole thing out of the window," said De Lorenzo. "The men had been cheated by the company for over a year by getting helpers' pay. The men are just as good citizens as the men in the Army."

Asked whether De Lorenzo put the union ahead of the country, the latter replied: "I do not separate them—you can't have one without the other—they go together. I put employment ahead of production because that is what



Henry J. Kaiser, shipbuilder, steelmaker and new president of Brewster Aeronautical Corp., right, his son, Henry J. Kaiser Jr., and Tom De Lorenzo, union leader, left, discuss means of restoring company's plants to full war production. De Lorenzo last week testified before a congressional investigating committee

I am paid for. As a citizen I put production first."

Another thing that aroused the union's ire, said De Lorenzo, was what happened when the Navy recruited Brewster plant guards into the Coast Guard reserve. "The guards did not want to go into the Coast Guard," said De Lorenzo, "so the Navy came to us and asked our assistance. It was agreed that we would encourage the men to enlist on this basis: They would go in voluntarily, there would be no interference in any way with their seniority and other rights under the union contract, and they could resign from the Coast Guard any time they desired.

"The guards were assigned to their posts on a seniority basis. A little while later the management at the Johnsville, Pa., plant wanted to order these guards to take different posts than had been assigned to them under seniority and that would have been in violation of our contract. We asked for an arbitration and argued it with Mr. Riebel from 6:30 one evening to 3:30 in the morning. Mr. Riebel refused to arbitrate and ordered the guards to the new posts. Then the militia arrived with machine guns and tear gas and four guards were thrown in the brig. The men struck."

Another time, said De Lorenzo, three girl helpers were fired on the charge that they were asleep on the job. This charge was groundless, he said, as actually they had been guilty of signing an application for the removal of a supervisor. "Riebel," said De Lorenzo, "first agreed to give this case a hearing. Later he reversed himself—and the men left the plant at 4:30 in resentment."

While the union was under contract to work eight hours a day, he explained, the men had agreed to work ten under a voluntary arrangement. But though

they showed their displeasure by walking out at the end of eight hours on that day, said De Lorenzo, no production was lost as they always were killing two-thirds to three-fourths of their time anyway because of lack of materials.

Chairman Drewry wanted to know why the union had gone to Washington and protested to the War Production Board and the Navy against changing from a dive bomber to another type of plane. "What business is that of the union," he asked. "Isn't that something for the government and the management?"

Roundly Attacked Model Switch

"In 1941 we had been changed from a fighter to the dive bomber," replied De Lorenzo, "and had lost a year's production due to retooling. Thousands of men had been laid off. We had been through one mess and we did not want to go through another." The union at that time, in a letter to Carl Vinson, chairman of the House Naval Affairs Committee, roundly denounced Assistant Secretary Ralph Bard for making another model switch at Brewster. "That letter," said De Lorenzo, "was answered by the Bureau of Aeronautics and after the matter was explained to us we stopped raising hell."

De Lorenzo testified that his pay as union president is \$95 a week. In addition he gets \$30 a week for expenses, plus remuneration covering railroad transportation and hotel rooms. At another point in his testimony he expressed the view so customary among CIO leaders:

"Here are managements," he said, "getting new plants, making untold profits. We're not getting equal treatment. Some of our members feel we have given up too much already and if

we give up any more we'll wind up with a fascist form of government."

The two former Navy managements, said De Lorenzo, hired public relations experts, one at \$30,000 and the other at \$16,000 a year. "But Riebel and Van Duzen handled it all themselves and they would say things that mortified these public relations men in our meetings to the point where I felt bad about it."

Asked whether he would get along with the new Brewster president, Henry J. Kaiser, De Lorenzo said: "Kaiser is the first man I've seen in 15 months in that management who has the brains, intelligence, ability and forcefulness to run that plant. Riebel and Van Duzen are not fit to black his boots."

Rep. Ward Johnson (Rep., Calif.), showing his anger only by his heightened color, was unable to get the witness to admit that he ordered strikes or slowdowns; De Lorenzo denied this—he said that would be illegal under the Connally-Smith act.

"Then you would say that you are not indispensable to this union?" asked Mr. Johnson.

De Lorenzo nodded vigorously in agreement, whereupon Johnson neatly sprung a trap on him by asking: "What is your draft classification?" Startled, the witness replied: "It's 3-A, I think." Asked what he was contributing toward the war effort, he said he thought he was engaged in an essential occupation. He admitted that not only is he of military age but that he is in sound health.

Stenographic report of the hearing was requested by representatives of Selective Service which is about to review the deferments made by the local draft board which has dealt with De Lorenzo and many other Brewster workers. It also is concerned with what were described as attempts by the union and its president to dictate the draft deferments of Brewster employees.

De Lorenzo admitted that he had at one time told Mr. Riebel to tell Major Brady, Selective Service official in Long Island City, "to go to hell", when he insisted that draft replacement schedules be passed on by the company management, not the union.

The witness denied that he is a Communist and it was brought out that he had been violently attacked in the *Daily Worker* for his opposition to communism.

At the conclusion of the hearing, Mr. Hebert said he was going to recommend that the House Naval Affairs Committee request withdrawal of the Brewster contract by the Navy if De Lorenzo continues as president of the Brewster union. De Lorenzo argued that such action would indicate that the fascism he fears had already come to the United States.

Word was received from Philadelphia, where the CIO convention was in session, that R. J. Thomas, president of the UAW-CIO, had declared the national officers would investigate affairs of Local 365, the union headed by De Lorenzo.

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 LOANS: Temporary loans of controlled materials and class A products obtained pursuant to an allotment are permissible under terms of CMP regulation No. 1. However, when a loan is made, the consumer making it must assure that the material or products loaned will be returned to him when he needs them in order that there will be no interference with his authorized production schedule. Generally, a loan for a period of more than three months would be considered equivalent to a transfer of the materials and therefore unauthorized, except as transfers are specifically permitted by CMP regulation No. 1.

A consumer borrowing controlled materials or class A products need not reduce his allotment account by the amount of controlled materials involved, since the materials must be returned to the lender and the borrower must be in a position to make the return. Full records of the loan transaction must be kept by both parties.

CLASS B PRODUCTS: Customers may make allotments to class B product manufacturers in two instances: Where the customer has obtained an allotment or material believing that he would make the product himself and finds that unforeseen contingencies prevent him from doing so; where the customer designs and engineers a product and it is his practice to subcontract for the production of all or a portion of such products and the actual manufacturer is not in a position to anticipate requirements of materials or components for making it. Applications for allotments must not include controlled materials needed to make class B products which will be incorporated in the product covered by the application, and that a customer must not make an allotment for a class B product unless he has received an allotment covering such product.

PD-1A CERTIFICATES: An applicant receiving a PD-1A certificate should retain the original certificate as basic authority to extend ratings for the items and materials which it covers. A certification placed on or accompanying a purchase order is all that the supplier should receive. If the supplier insists upon evidence of existing PD-1A certificate, a photostatic copy should suffice. Method of application and extension of preference ratings is set forth in priorities regulation No. 3.

MINIMUM PRODUCTION RUNS: In placing orders for materials other than controlled materials and class A products, manufacturers may take into consideration in some cases minimum production runs of their suppliers as well as immediate needs of their own plants. A customer may order and receive requirements for a longer period in advance than he needs at the actual time of delivery if, but only if, it is not practicable for him to get the item from any supplier in the smaller quantity which he needs at the time of placing the order. If a customer can order in such a manner that his minimum requirements and inventory conditions are met, but wants to order or accept deliveries in excess of his actual needs, he should apply to the Redistribution Division of WPB for permission, stating why it is not practicable to meet the above conditions.

PACKAGING EQUIPMENT: Approved leases for certain types of packaging and labeling equipment used for can closing may be renewed without applying again for approval or for new ratings.

OFFICE MACHINERY: Persons receiving authorization to purchase restricted types of office machinery must buy it from the supplier named in the authorization and are permitted to procure only the brand of equipment specified.

GENERAL SCHEDULING ORDER: All purchase orders which were approved or delivery schedules which were frozen prior to Sept. 17, 1943, under provisions of orders superseded by order M-293, as amended that date, retain their approved or frozen status. Where purchase orders for class Y items under order M-293, or for items covered by similar procedures under other orders which have been superseded, were approved under the previous procedure, the approval remains effective and the person with whom the order is placed must accept and schedule it accordingly, even if he receives it after the item has been reclassified.

INDEX OF ORDER REVISIONS

Subject	Designations
Automotive Equipment	L-270
Flatware	L-140-b
Generating Equipment	L-102
Ice Producers	CMP No. 5
Insignia, Military	L-131
Jacks	L-322
Jewel Bearings	M-293
Machines and Parts	PS No. 136
Solders	M-43
Tin Plate	M-21-e

CMP REGULATIONS

ICE PRODUCERS: Preference rating available to manufacturers of ice to obtain maintenance, repair and operating supplies has been increased to AA-1 from AA-2. At the same time, radio communication and radio broadcasting have been removed from the MRO regulation inasmuch as purchase of supplies for these activities now is covered by order P-133, which deals with them exclusively. (CMP No. 5)

L ORDERS

GENERATING EQUIPMENT: "Used electrical generating equipment" covered by order L-102 now is limited to that having a rated capacity of 1500 kilowatts or more. Used steam boilers, formerly subject to the order which prohibits transactions on used electrical generating equipment without specific approval of WPB, has been removed. (L-102)

MILITARY INSIGNIA: Military insignia containing plastic or metal may be produced only on orders or contracts originating in certain specified government agencies or firms designated by WPB in an amendment to order L-131. (L-131)

FLATWARE: Permission has been granted to produce durable flatware for restaurants, institutions and home use but production is restricted to essential eating utensils. Specifications, outlined in table A of the order, provide for a small amount of nickel for plating under silver or chrome which will produce a heavier and more durable grade of flatware. Alloy steel flatware may now be made for restaurant and institutional use from alloy steel in distressed stocks. Flatware for preferred orders will not come under the specifications of table A but may be produced according to specifications of the procuring agency. Each manufacturer is allowed to use during the balance of 1943 35 per cent of the average quarterly amount of iron, steel and other metals he used during the corresponding period from July 1, 1940, through June 30, 1941. Beginning Jan. 1 production of flatware, including preferred orders, will be on a quarterly quota basis.

The order also prohibits manufacture of hollowware, except for preferred orders, from

metals other than gold, silver and sterling silver unless the metal was first put into process prior to Nov. 5, 1943. (L-140-b)

AUTOMOTIVE EQUIPMENT: Permissive production of a long list of automotive maintenance equipment will be increased under provisions of an amendment to the WPB limitation order. At the same time, distribution of these items will be more closely controlled regardless of how they are to be used. Manufacturers can make delivery of these items only on ratings assigned by specified forms. (L-270)

JACKS: A new order, L-322, simplifies and standardizes models and sizes of mechanical, hydraulic, air and electrically-operated jacks. Number of jack models is reduced from 403 to 225 and the number of sizes from 1825 to 864. Manufacture after Nov. 1 is restricted to the simplified and standardized capacities, sizes and models set forth. It is also ordered that 25 per cent of each month's non-military production of 3, 5, 8, 13 and 20 ton portable, upright hydraulic jacks is to be set aside and held available for delivery against orders rated on WPB-541 and 547. (L-322)

M ORDERS

TIN PLATE: Under terms of supplementary order M-21-e, as amended, it is permissible to recoat material in a number of applications, thus permitting the salvage of misprinted or rusty material. Minimum practicable coatings in excess of 1.25 pounds per base box for hot dipped tin plates in gauges heavier than 112 pounds per base box are permitted. Tin orterne plate coated with less tin than specified in schedule A for any permitted use is specifically allowed. The provision restricting use of tin to the quarterly quota assigned by the WPB is removed. Eight items have been added to list A. Items of less than 5 net tons of tin plate short terms or long terms in the inventory of a person not regularly engaged in the sale of such material are released from control. (M-21-e)

SOLDERS: Restrictions on tin content of solders have been relaxed where it has been found that higher tin content is necessary. Under former provisions of order M-43, this higher content could be used only upon the granting of appeal. Specific provisions now permit higher tin content in some cases above 21 per cent for certain solders, thus reducing paper work. Reworking of block tin pipe also is permitted. (M-43)

JEWEL BEARINGS: Jewel bearings have been removed from general scheduling order M-293. These bearings have been unclassified products subject to reporting when operators of plants producing them were instructed to file reports. (M-293)

PRICE REGULATIONS

MACHINES AND PARTS: Following items previously covered by either price regulation No. 188 (Manufacturers' Maximum Prices for Specified Building Materials and Consumers' Goods other than Apparel) or the General Maximum Price Regulation, are now added to price regulation No. 136 as amended: Dressers, abrasive wheel (except diamond dressers); pipe and tube tools, manually operated, including beading, belling, bending, cleaning, cutting, expanding and flaring, and wrenches for operating; jacks and jack screws, manually operated; tools, manually operated for the cutting, forming and punching of metals, vices, all types; vise mounts, stands and supports; springs (except springs subject to section 1390.32, appendix A, of regulation No. 136, 1390.32, appendix A, of regulation No. 136, and bed and furniture springs subject to regulations Nos. 188, 213, and 380; wheels (exclusions Nos. 188, 213, and 380; wheels except those specifically designed for military use and subject to section 1390.32, appendix A, of this regulation, and price schedules Nos. 6, 246, and 452. (No. 136)

Appointments-Resignations

R. L. Vaniman, director of the Automotive Division, has been appointed

chairman of the truck committee of the Combined Production and Resources Board, WPB.

Davis M. DeBard has been appointed deputy director of the Conservation Division, War Production Board.

Andrew Leith, has resigned as chief of the Ferroalloys Branch, Steel Division, War Production Board.

Lewis S. Greenleaf Jr. has resigned as director of the Consumers Goods Bureau, War Production Board.

WPB Rules on Position of Special Tooling Under CMP

Any person who is eligible to purchase controlled materials for maintenance, repair and operating supplies under any War Production Board regulation or order may use the allotment number or symbol assigned by such regulation or order to buy controlled materials for special tooling for his own use or for the use of a tool maker in manufacturing such special tooling for him, even though the tooling is a class B product, WPB has announced.

Special tooling is designed to mean, "any jig, die, mold, fixture or other tooling of a type which has only one special use, is not a standard product and is not produced for general sale by the manufacturer of the tooling." This ruling is contained in direction 35 to CMP regulation I.

The direction is a special exception to the general rule which prohibits a customer from supplying materials to the manufacturer of a class B product and prohibits the manufacturer of a class B product from accepting materials from another manufacturer.

Persons who buy special tooling under the direction must charge the cost of controlled materials used in the manufacture of such tooling to their MRO expenditures for the purpose of complying with the quantity restrictions imposed by CMP regulation No. 5. However, manufacturers of special tooling need not charge their allotment accounts with the quantity of controlled materials delivered to them by their customers under that direction. Persons operating under MRO orders or regulations which permit the acquisition of capital additions may treat their acquisitions of special tooling as minor capital items.

New B Product Code, 690, Assigned to Storage Tanks

Manufacturers of processing and storage tanks have been advised that a new B product code, (No. 690), under the jurisdiction of the Building Materials Division now appears in the product assignment directory and in the alphabetical index of products in the War Production Board publication, *Products and Priorities*.

Steel and Aluminum Redistribution Activities of WPB Decentralized

Regional offices will maintain inventory lists of idle material for use "as is" and will record holdings of manufacturers who have not reported them previously. . . Supplies not moving within 30 days after listing will be reported to Washington

REDISTRIBUTION activities of the War Production Board at the Steel Recovery Corp. are being discontinued and the corporation's records are being transferred to WPB regional offices. A similar procedure is being followed with regard to idle aluminum listed with WPB. This is in line with WPB's program of decentralization.

Since November, 1942, WPB has located in idle stocks, through this agency alone, more than one million net tons of steel, of which more than 600,000 tons already have been moved into plants engaged on essential contracts.

Inventory lists of idle steel classified for use "as is" have been transferred from Steel Recovery Corp. to those WPB regional offices in whose areas the material is physically located. Any manufacturer who holds idle steel which has not been reported should do so now to the regional office having jurisdiction. Significant quantities of steel which do not move within 30 days after listing will be reported by the regional office to the Surplus Inventory Branch, Steel Division, Washington, for assistance in arranging for disposition of the material.

Records of idle aluminum stocks also will be forwarded to WPB regional offices which will assist authorized buyers to locate shapes and forms listed as available for redistribution and use "as is." Aluminum and Magnesium Division will maintain a national inventory in order to assist regional offices in disposing of the materials reported to them.

Of the more than 46 million pounds of aluminum reported to WPB as idle, only some 5 million remain to be redistributed. Holders of idle aluminum, which has not been reported, are urged to file with the nearest WPB office.

Records of idle copper stocks listed with the WPB at the Copper Recovery Corp. will not be transferred to field offices. Instead, holders of copper who have filed reports with Copper Recovery are requested to list with their regional office any additional material which has become idle since the time of their last report. For a period of 30 days the facilities of the regional office will be used to locate authorized users of the material in its present form. At the end of this time, records of remaining material will be transferred to the Copper Recovery Branch, Copper Division, New York, for inclusion in a national inventory file of available surpluses.

To date, 355,000,000 pounds of cop-

per have been reported under the copper recovery program, of which 294,244,000 pounds already have been redistributed.

Copper, aluminum and steel in forms which must be remelted before they can be used in the war effort, will move according to existing regulations and through normal scrap channels.

Provision has been made for the movement of controlled materials under priorities regulation No. 13, on what is known as an "ex-allotment" basis. Regional offices now have authority to grant permission for such transfers without requiring the purchaser to charge the material against his CMP allotment, provided he does not exceed his dollar limit authorized. In the case of steel and aluminum, a producer who has a permitted use but no allotment may make application to acquire the materials he needs if they have been reported as idle or excess to WPB.

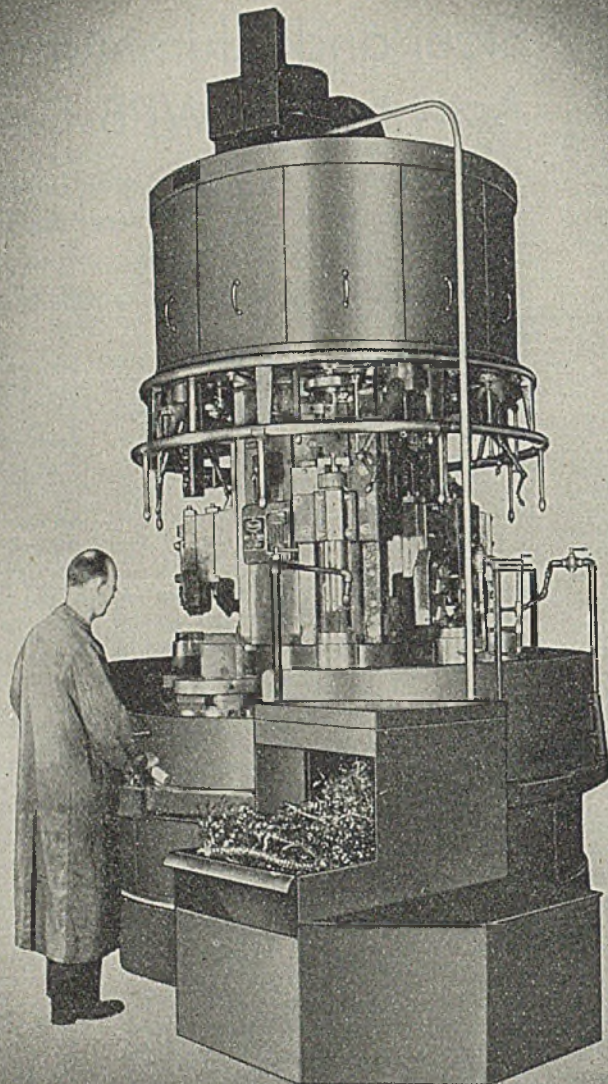
Less Critical Areas Should Be Used for Subcontracting

Prime contractors have been requested by the War Production Board to cut down further on the placement of subcontracts in tight labor areas and to utilize to the utmost the less critical areas for sub-contracting. Charles E. Wilson, executive vice chairman, WPB, stresses the necessity for bringing labor supply and production requirements into balance and has asked that suggestions on how to relieve the pressure on critical labor areas be forwarded to WPB's Procurement Policy Division.

Antifriction Bearing Deliveries Not Frozen

Reports circulating to the effect that antifriction bearing deliveries have been "frozen" after a certain date are wholly unfounded, War Production Board said last week.

About 30 of the larger bearing consumers have been informed that they must secure WPB approval of deliveries of bearings requested by them for the months of December, 1943, through May, 1944. Such approval is required only as to types and sizes of bearings which the consumer wishes to receive in substantial quantities in connection with authorized production schedules.



Mult-Au-Matic PRODUCTION . . .

The Bullard Mult-Au-Matic keeps producing while your operator loads the work. One of its 8 stations is for loading, while the other stations keep right on going. Result:—on the job shown here, a finished cylinder sleeve at every index of the carrier.

One user doing war work says—"The machines themselves are doing an excellent job, and an important result of their use is the releasing of 48 operators to serve in the armed forces. So that not only are your machines producing parts for tanks, but, indirectly, soldiers for the Front. I am sure that our experience is multiplied many times by the results obtained by the numerous other concerns using your equipment, and your men should be very proud of the substantial direct and indirect contributions they are making to the war effort."

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Independent Speeds and Feeds
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BRIDGEPORT, CONNECTICUT U. S. A.

Providing maximum number of jobs to be foremost postwar industrial problem. Shakedown in employment inevitable even though automobile production reaches high levels. . . Experiments under way on flapping-wing airplane by Stout

THINKING on postwar industrial problems usually simmers down to the one primary problem of providing the maximum number of jobs, and at this point three claimant groups can be discerned: Returning soldiers, the seniority males now at work, and the females.

The first of these groups will be vociferous enough to make its demands felt ahead of both the others, and no one in management, government, or labor unions will dispute the service men's right to first consideration. As far as the "seniority" males and the working females are concerned, the problem here would seem to be in large measure one for union leaders to assume, one which they will have to assume if their organizations are not to be broken by dissension.

In considering the matter of postwar jobs for X-million people, it must be recognized at once that there is going to be required a considerable shrinkage in the present level of industrial production throughout the whole country—shrinkage in total man-hours worked, shrinkage in dollar volume of output, shrinkage in amounts of material consumed, shrinkage in requirements for new equipment. Even if we are to build automobiles at a rate of 50 per cent beyond the best ever achieved thus far, there will still be necessary a thorough if not violent shakedown in all forms of production. The present pace is wasteful, inefficient, in many places even sloppy. To revert to an economical and profitable basis once more will require a generous sprinkling of the powdered alum of sound business methods.

Foresees Considerable Unemployment

This is going to hurt many people and many businesses. It may mean considerable unemployment and certainly the dismissal of those who are not "normal employables." It could give rise to powerful minority cliques clamoring for special privilege from government, from labor unions and from industry.

It might mean the U. S. Employment Service, which even now with a local staff of 600 is incapable of handling the overall hiring problems of a city like Detroit, will have to be converted to the U. S. Disemployment Service to weigh the merits of plant dismissals and render judgment on whether this employe or that employe is entitled to continue work.

Current activities of William Bushnell Stout—"the Dearborn screwball" as some of the snap-judgment boys call him—and his research staff in the development of a helicopter, a roadable airplane, and a flying automobile have been well publicized. As recently as last week, Waldo E. Waterman, one of Stout's en-

gineers who has had extensive experience in designing and building flying automobiles, said that within six months to a year he expected to be able to demonstrate some flying models of these advanced vehicles now being readied for

SLOAN OPTIMISTIC

Postwar automobile production should exceed prewar production by at least 50 per cent for three or four years after the reconversion period, Alfred P. Sloan, chairman of General Motors Corp., Detroit, told 1200 Cleveland business leaders, Nov. 9, speaking at a Cleveland Chamber of Commerce luncheon in honor of General Motors and its Cleveland divisions.

Before the war automobile output averaged about 4,000,000 cars annually. Mr. Sloan said he looked forward to yearly production of 6,000,000 to 6,500,000 after the war.

He pointed out that great backlogs in consumer demand for all kinds of goods, durable, semidurable and perishable have been building up during the war. He said estimates have been made that if the war continues until the end of next year there will be a backlog of more than \$100 billion of purchasing power in the hands of American consumers and an additional backlog of \$30 billion to \$40 billion in the hands of business other than insurance companies and financial organizations.

"From the standpoint of today's technology," he said, "the greater part of the American industrial system is now obsolete and must be rebuilt."

The General Motors executive further expressed the belief that control of prices, wages, goods, etc., should be continued until industry had "re-established itself" for the manufacture of peacetime goods and was able to create enough goods to enable the law of supply and demand to operate again.

possible postwar manufacturing projects by Consolidated Vultee Aircraft.

Also fairly well known are some of the general details of the light-weight airplane engine on which Stout is working. It is aimed at the 150-horsepower, 150-pound, 150-mile-per-hour, \$150 goal which may or may not be achieved. At any rate it embodies a number of inno-

vations in construction, such as a multi-piece crankshaft, antifriction connecting rod bearings, etc.

What only a few intimate friends know as yet about Stout is that he is doing some still further advanced aeronautical thinking in connection with the ornithopter—or flapping wing airplane. He has not gone very far with the idea, but it is known that studies are being based on the "aerodynamic" characteristics of, not the bird, but the dragonfly which can outmaneuver just about any air-borne creature or object, it is said.

A number of air-minded youngsters are building ornithopter models at the behest of Stout, and he has gone so far as to rig up a wing and motor unit for tests. He is the first to admit, however, that flapping-wing airplanes are far removed from any semblance of the practical stage, and he will make no predictions as to their eventual practicability.

More cogent thoughts by Stout on the future of aviation, particularly in respect to its commercial possibilities and "colonizing" influence on the world may be read in a forthcoming book, *Tomorrow We Fly*, written by Mr. Stout in collaboration with Franklin M. Reck and to be published shortly by Thomas W. Crowell Co., New York.

Report Unhealthy Labor Situation

Observers are expecting the news to break any day about the unhealthy labor situation at the former Hudson Naval Arsenal now being operated by Westinghouse. It is fairly common knowledge that this large Navy job shop was overstaffed for the amount of work being done, but as has been discovered in Washington, it is not so easy to start dismantling a large working force once it has been organized, in spite of the internal mumbling among people on the scene.

It is difficult to assign the specific blame for the trouble. Hudson operating men ostensibly were running the shop, but the Navy Department was signing the paychecks and supposedly instructing Hudson on the extent of planned production. Meanwhile, a system of upgrading developed, by which various employes were selected to be "leaders," their hourly rate boosted 10 cents above the basic rate, and subsequently new "leaders" appointed whose rate went up another 10 cents beyond the previous leaders.

The practice of rapid upgrading of unskilled labor to so-called skilled labor rates has been prevalent throughout the Detroit area, but it seems to have been carried to extreme lengths at the Naval arsenal. Many are freely predicting an imminent WLB investigation, whether here or in Washington.

It is difficult to see any motive other than rank selfishness in the recent vote of 10,000 Chevrolet employes at Flint, Mich., who in balloting conducted by the NLRB on the question, "Do you

wish to permit an interruption of war production in wartime as a result of this dispute?" responded to the tune of 8099 for striking and 2070 against. The dispute in question was said by a union official to be over a dozen or more grievances of the petty type, and not over any fundamental issues. The vote, it will be seen, was not on whether to insist on settlement of the grievances or to drop them, but rather, "How about a strike, boys, yes or no?"

New sound-deadening material known as Vibeston, which may go far to alleviate the effects of noise and vibration on the ears of airplane crews, has been developed by the general laboratories of United States Rubber Co. Composed of asbestos and other nonstrategic materials Vibeston goes beyond the comparable material used for this purpose—mica—in utility since it is as much as 50 per cent lighter, and thus permits noise-proofing larger areas of plane interiors. It is also claimed that by dampening vibration, the material improves the fatigue properties of structural members. A number of postwar uses are envisioned outside the aircraft field.

U. S. Rubber also has announced a sixth major type of synthetic rubber to be discovered through chemical research. It is called Uskol and takes its place alongside Buna S, Buna N, Neoprene, Butyl and Thiokol. It is said to offer a new high degree of assistance to solvents, can be vulcanized in several ways to acquire high physical properties, shows high tear resistance (exceeding natural rubber), has no odor either in raw or fin-

ished state, can be blended with other synthetics, and is highly resistant to the effects of sunlight, ozone and oxygen.

Uskol resulted from research to find a rubber which would provide greater resistance to high-octane aviation fuel and the aromatic fuels used in aircraft. It will be produced at the company's chemical division, Naugatuck, Conn.

Use of a double-end cutting tool in machining the insides of molds for centrifugally casting airplane engine cylinder barrels at the Ford Rouge plant has resulted in the saving of an appreciable number of man-hours, and by eliminating the uneven torque incidental to slower operation has simplified the setting-up procedure. Output of machined molds per operator has been better than doubled.

GM Purchasing Orders Increase

Survey of General Motors purchasing records for 1942 shows that orders totaling \$384,307,433 were received by 4913 companies in Michigan alone, an increase of 86 per cent over the figure for 1939. Michigan stood first among the states in dollar volume of business with GM, accounting for 28 per cent of the U. S. total of \$1,390,572,624, and also ranked first in number of subcontractors and suppliers.

"It is imperative that automobile graveyard operators increase their purchase of old jalopies and production of scrap during the next four months a minimum of 25 per cent over the average of the past three months," warns the WPB regional salvage manager in Detroit. To make the goal, the WPB is assigning

quotas to car wrecker lot operators. Nevertheless scrap dealers and brokers in this area are virtually unanimous in the opinion that supplies of all types of scrap are ample, even to carry through the winter, and fail to see the need for current pressure to collect additional scrap which in most cases is of inferior grade and difficult to process. They feel the movement of scrap would be facilitated by the WPB if it would abandon efforts to maintain both a floor and ceiling on scrap prices, permitting the market to fluctuate beneath the established ceilings.

To help solve the critical bottleneck in facilities for machining transmissions and axles for the large military truck program mapped out for 1944, industry experts here have suggested to the WPB in Washington that machine tool builders be drawn into the picture, inasmuch as their new orders have tapered off sharply, and some already have been soliciting subcontracting work.

The fact most of the trucks now being scheduled are of the six-wheel drive type, plus the need for 100 per cent replacements in the field, seriously complicates the supply of ax'es and transmissions, since the truck industry in the past has built only a fraction of the quantities now being proposed.

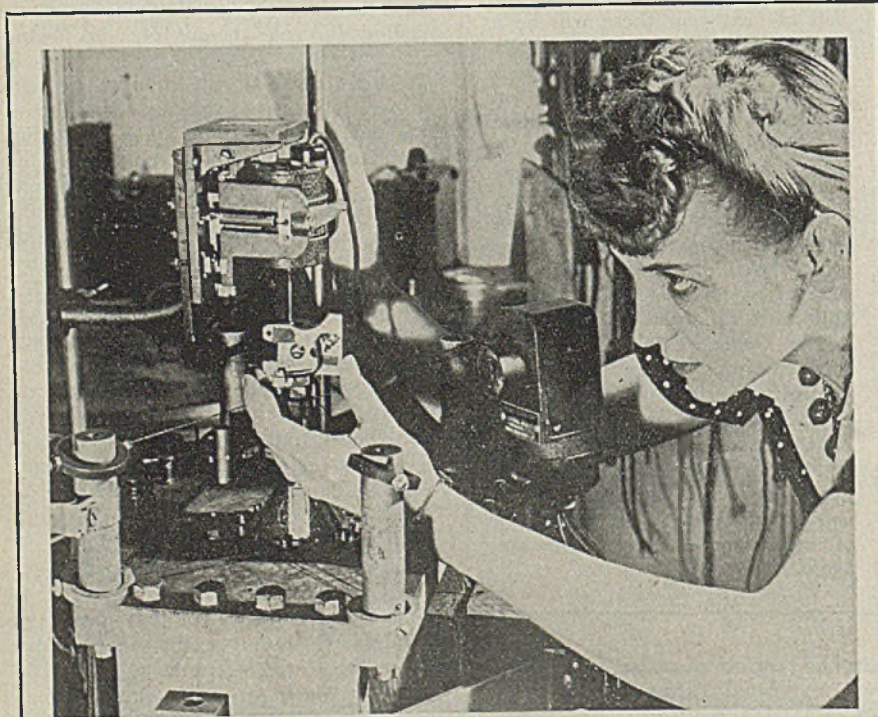
Predicts Jeep To Influence Design of Postwar Autos

The "jeep" will have a profound influence on the size, cost and performance of the car of the future was the prediction advanced by Ray Elmer Thompson, secretary of the Automobile Club of America.

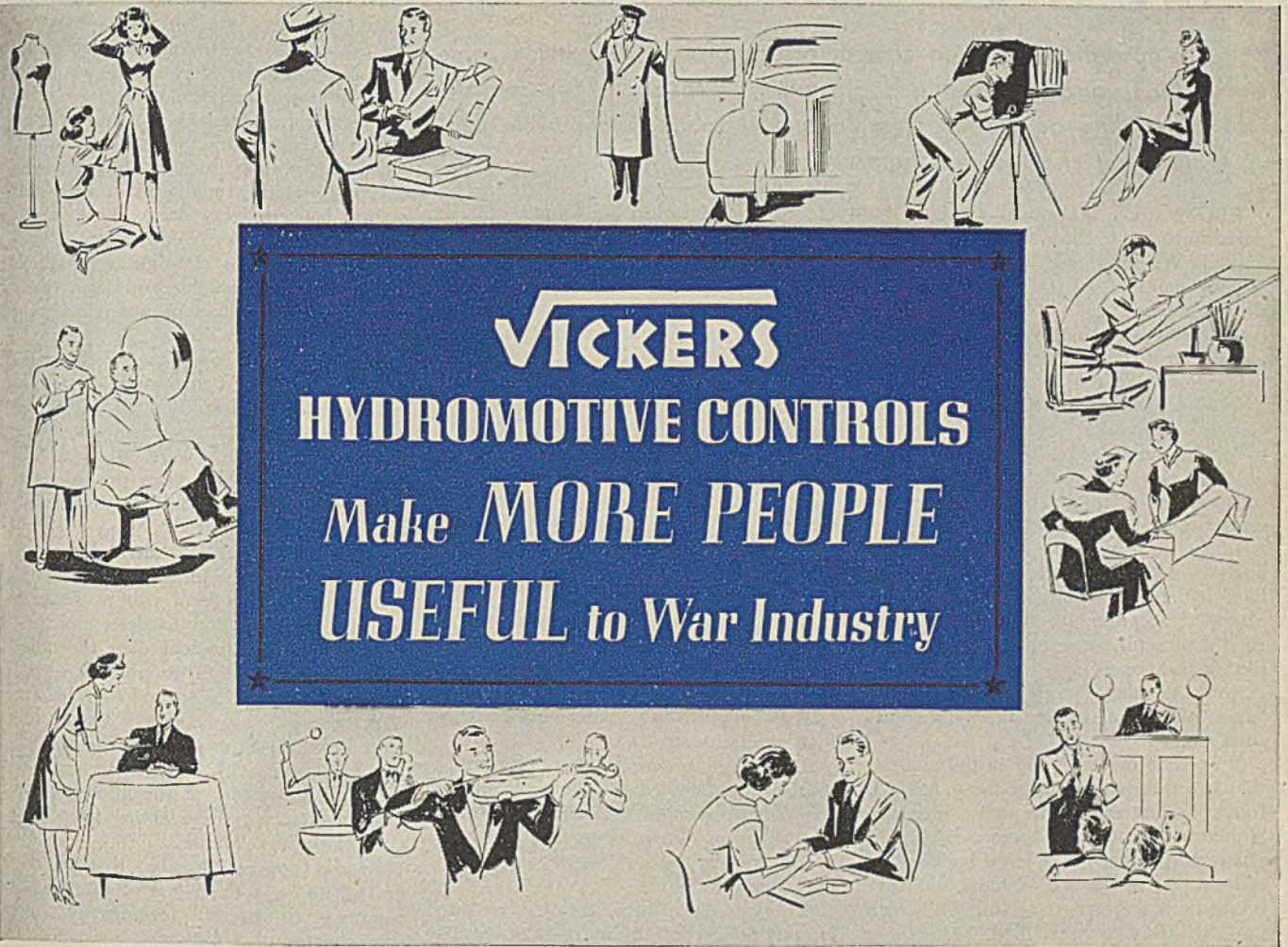
He said the famous scout car has introduced a new concept in motor vehicles and that its influence is already being felt among the designers and engineers making plans for postwar automobiles. The jeep, he added, has proven to an economy-conscious nation that a small, light-weight vehicle can perform effectively in competition with larger, more powerful cars.

Jones & Laughlin Plants Set Records in October

More all-time steel production records were broken in October by Jones & Laughlin Steel Corp. Pittsburgh works broke its previous record of October 1942 for production of steel ingots and castings. Bar mills of this works also broke the previous record of October 1942 while the hot strip-sheet mill broke its best record of May 1942 for total finished products and of April 1943 for plates. At the Aliquippa Works, the No. 1 blast furnace broke its previous record of August 1943 while the sintering plant broke its best record made in October 1942. At the Otis works, Cleveland, the No. 2 blast furnace and the sintering plant broke production records established in September.



FATIGUE TESTER: Engineering assistant in General Electric Co.'s laboratory tests a metal sample to determine to what extent it can withstand vibration. Energized by powerful electronic equipment, this machine vibrates the sample up and down about 10,000,000 times in five hours



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USEFUL to War Industry

Lawyers—manicurists—barbers—waiters—salesmen—housewives—all sorts of people must be used by industry to meet the critical manpower shortage. These people are usually entirely unfamiliar with machines and shops. Before they are useful in production, their sense of strangeness and their lack of self confidence must be overcome . . . and they must be taught to run a machine.

A complex machine makes the training task extremely difficult. It is much easier with machines equipped with Vickers Hydromotive Controls.

When one of these people is shown a Vickers controlled machine—shown how simple the con-

trols are—how easy it is to produce good work, his strangeness and lack of self confidence are quickly overcome. It becomes much easier to train him to useful production needs.

With Vickers Hydromotive Controls, most of the required skill can be built into the machine. Complex operations can be reduced to simple routines or made automatic. Controls can be interlocked so it is impossible to do the job wrong. Exact load limitations are easily applied.

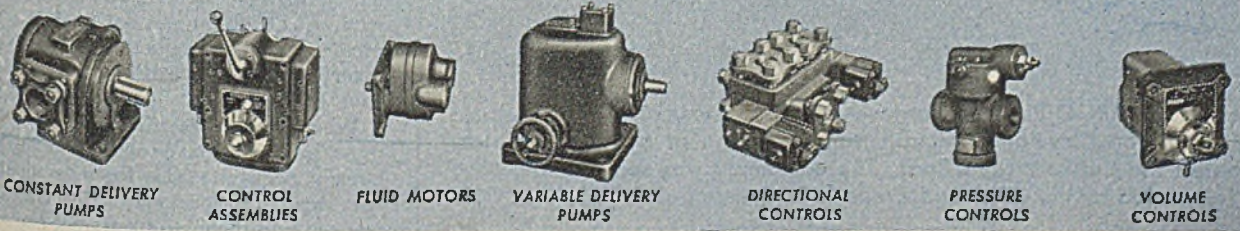
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WING TIPS

Co-operation between contractors and producers helps solve critical aircraft forging shortage. . . Procedure for realistic scheduling developed from factual data. . . Time cycle procurement chart proves helpful

FROM study of critical shortage reports flowing into the Aircraft Scheduling Unit at Wright Field, Dayton, O., from aircraft contractors, it became apparent this summer that one of the most troublesome situations was in respect to aircraft steel forgings, inasmuch as a disproportionately high per cent of the shortage reports were in this classification. Hence an immediate and intensive study to determine basic causes and methods of correction was initiated by the forgings section of the Steel Unit of the Aircraft Scheduling Unit office.

First step was a breakdown and analysis of ASU-16 critical shortage forms filed by aircraft contractors. They were classified according to the number from each contractor, according to the number filed against each major forge shop, according to plane models, JAC groups, "age" of orders, basic causes of shortages, etc.

It became evident early in the analysis that the information from these ASU-16 forms did not reflect the entire problem. Numerous instances were discovered where forge shops had large backlogs of orders on which no definite delivery promises had been made and on which no ASU-16s had been filed. The filing dates on some of the shortage forms studied were quite old and while on some of these orders shipments had been made, the reporting company had never had sufficient forgings ahead of sched-

ule to regard orders no longer critical.

Heading the basic causes of shortages in forgings by wide margin was the manpower problem in forge shops, which since spring has become steadily more critical because of inroads of the armed forces and loss of men to industries with less arduous working conditions. It required no crystal-gazer to realize at once that there would be no quick solution to the manpower problem. Production of the steel forging industry, excluding the "captive" shops, dropped 20 per cent in tonnage from April to August, but aircraft requirements increased.

Serious Problems in Forgings

Recognizing the serious situation in forgings, the Steel Unit of ASU moved in on the problem with a three point program under these general headings:

1. Squeeze all the "water" out of forgings requirements.
2. Arrange a consolidation of forging sources (without compulsion) to reduce the overall number working on similar jobs and thus obtain longer hammer runs on the specific types of forgings and save die sinking facilities.
3. Try to bring more forge shops into aircraft production, by overcoming timidity of outside sources to tackle aircraft work, and the reluctance of contractors to look for new sources.

The technique followed in the first of these steps was to obtain at Dayton the

records of all open orders for both Army and Navy aircraft steel forgings against forge shops where the conditions were most critical. Letters then were directed to the aircraft contractors involved asking them to review forging requirements carefully, stating minimum needs and setting back delivery dates to the maximum degree. They were asked to dismiss considerations of forgings on which deliveries were past due and recast their schedules in the light of immediate and near-term needs.

Summary and consensus of these replies from aircraft manufacturers were prepared and transmitted to the forge shops as "bedrock" requirements. The forge shops in turn were asked to determine the best deliveries possible and to indicate what it would be impossible to schedule as required.

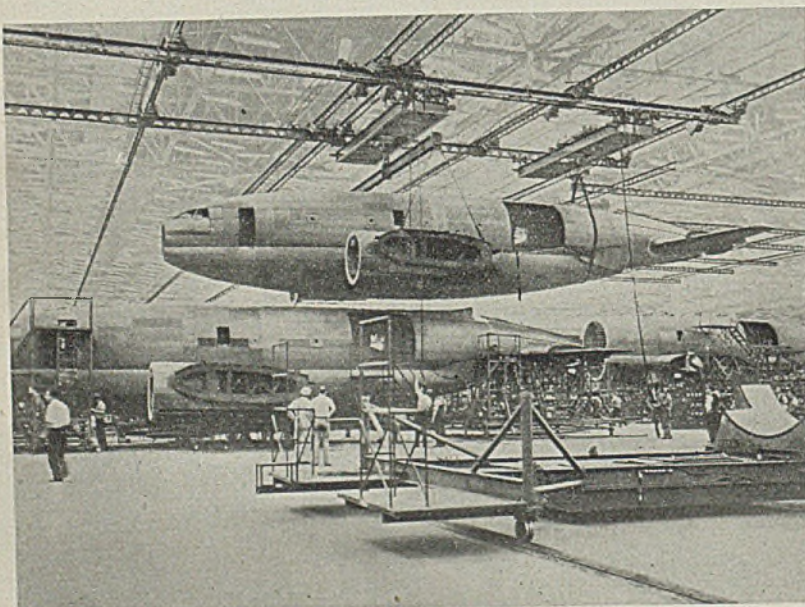
With this factual data direct from producers and users of forgings, the attempt was made by the Steel Unit to make a realistic schedule and to determine priority of one requirement over the other where necessary. This procedure has now been applied to several forge shops, with exceptional success. There are only about 60 forge shops in the aircraft supply picture, with 20 of them accounting for 95 per cent of the aircraft alloy steel melted for these shops from December through March.

It now appears possible that by the first of the year the worst of the critical shortages in aircraft forgings will be things of the past. Of major assistance in working toward this goal has been the exceptional co-operation shown by both aircraft contractors and by forging producers in assisting the Steel Unit of the ASU in working out a realistic solution to shortages. One helpful by-product of mutual understanding between the producer and consumer has been a time cycle chart for procurement of typical aircraft alloy steel drop forgings. In some instances late ordering on the part of the aircraft manufacturers has made it impossible to meet their requirements. This chart appeared in STEEL for September 27, p. 64, and showed graphically how the 21 weeks' time lapse between ordering and shipment of forgings, (overlooking delay factors) breaks down into clerical and production phases.

Teamwork on Repair Job Averts Work Stoppage

Working against the clock to avert a threatened work stoppage at Ryan Aeronautical Co. in San Diego, company men recently rushed a 5-ton hydropress cylinder across the continent, crammed a two-week repair job into six days, and got the press back into production a few hours before work in some departments would have had to stop.

When the main cylinder of the hydropress broke down, a new cylinder had already been on order for nine months. An expediter located it in Chicago, wedged into the end of a freight car on a



HANDLES CARGO PLANES: Large C-46 Curtiss Commando air transports ride a 10-ton Cleveland Tramrail transfer bridge at a New York state plant of the Curtiss-Wright Corp. The equipment was specially designed for the job by the Cleveland Crane & Engineering Co., Wickliffe, O.

OPEN-HEARTH ALLOY STEELS SINCE 1912

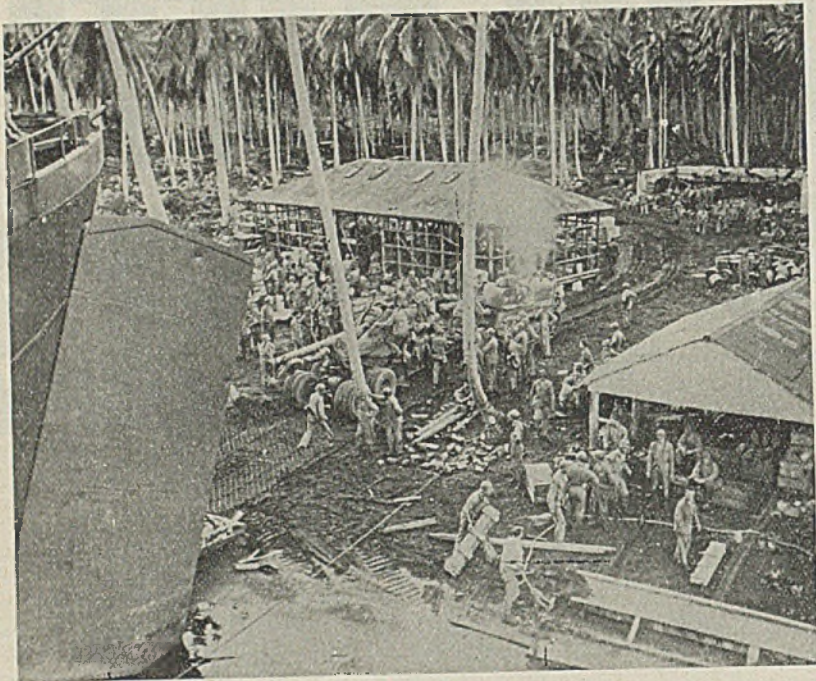
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NEWPORT, KENTUCKY



Electric furnace alloy steel will be available from our electric furnace plant for late January melting and February delivery.



JACK-OF-ALL-USES: A "pocket" airfield steel landing mat fills another role against the Japs in the South Pacific area. Here the jaws of a large LST vessel, left, open and a heavy gun rolls off onto an Irving steel mat in the Solomons

slow train. By some transcontinental string-pulling, he persuaded railroad men to unload the car, move out the cylinder, and load it onto a flat car at a cost of \$450. Then he had the flat car coupled onto a fast passenger train to Los Angeles which cost \$1000, after which the cylinder was rushed by truck from Los Angeles to San Diego.

Meanwhile a crew of picked maintenance men had been working day and

night in the plant to get the hydropress ready for installation of the new cylinder. Maintenance crews had to ease out the main parts an inch at a time in dismantling it. They raised the 20-ton head, drained 700 gallons of oil and removed the cracked 10,000-pound main cylinder. Then they had to slide out the 3-ton ram, which was slippery with oil and could not even be touched—they raised it by jacks wedged under it at a

wide angle, and held it there while rollers were inserted to slide it out.

When the new main cylinder arrived, five men worked 20 hours without rest to get it installed. During the last few hours dies were lined up all around the press, with operators ready to start the instant the maintenance men finished their work.

It was six days, almost to the hour, from the time the hydropress was disabled until the maintenance men finished testing the new installation.

Lockheed and Vega To Be Formally Merged

Vega Aircraft Corp. will be absorbed into Lockheed Aircraft Corp., effective about Nov. 30, it has been announced by Robert E. Gross and Courtlandt S. Gross, presidents of the two companies.

The merger, according to a statement to 90,000 employees of the Lockheed-Vega plants, is simply a continuation of the trend toward closer integration in operations of both companies and had been contemplated for some time.

Courtlandt Gross, Vega president, has been appointed vice president and general manager of Lockheed.

New England Business Increases in September

Business activity in New England during September rose 6.4 per cent from the August level to 146.7 per cent, according to the New England Council's preliminary index of general business activity. All components, except employment, and metal tonnage, contributed to the increase. Industrial employment in Massachusetts declined slightly, while metal tonnage receipts dropped 1.5 per cent.

They Say:

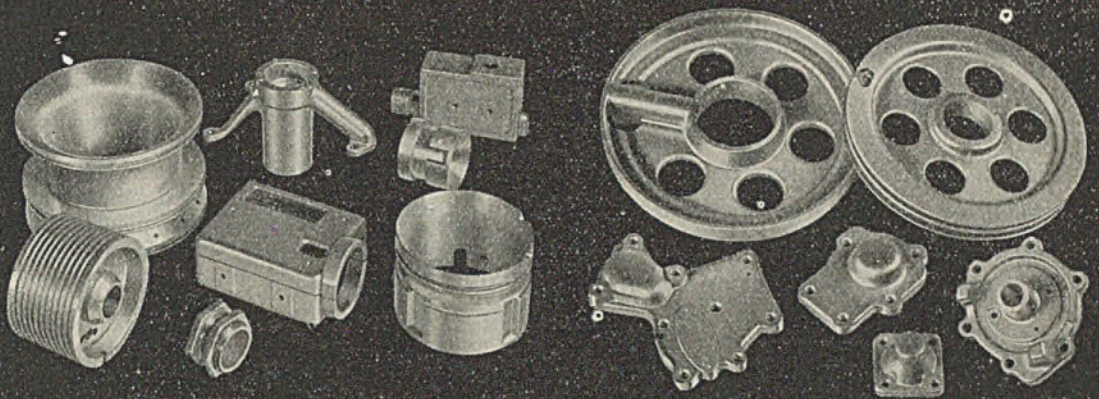
"We know that no one planned to bankrupt private ownership of the aircraft industry in order that the government could come in and take control, but if those who are advocating such control had sought a plan for that purpose they could not have found a better formula than: 'Greatly expanded sales, plus large inventory risks plus renegotiation, plus present tax rates, minus adequate postwar reserves.' Gentlemen, unless changes are made in the renegotiation and tax laws we will be in the position of the gladiators who said, 'Morituri, te salutamus,' or 'We who are about to die, salute you.'"—Ralph S. Damon, vice president and general manager of American Airlines Inc. before House Ways and Means Committee.

"Victory in Europe will be followed by a brief industrial slump in the United States due to reconversion problems which, in turn, will be speedily succeeded by a genuine primary postwar boom lasting two and a half to four years. Twenty to 50 years of broadscale advancement are in prospect for the world, dependent, however, on a mental revolution by people in low-living-standard areas and their acceptance of technical and financial aid from forward na-

tions such as America and Great Britain."—Glenn G. Munn, economist.

"Some day our boys will return. I pray God that they may not come back to find that through love of ease, political cowardice and personal ambition, we have betrayed them. I call solemnly on the American congress and the great American people to join with us in a courageous tax program. Let us keep faith with our fighting men. Let us keep faith with America's future."—Fred M. Vinson, Director of Economic Stabilization.

"A substantial part of the wartime upward shift in the American wage structure will be maintained after the war. The number of families in the income brackets \$3000 to \$5000 a year will be closer to the current 24 per cent than the 12 per cent in 1935-36. Employment levels will fluctuate at around 50,000,000, with unemployment in the three to five years following the transition period reaching about 5,000,000."—A. W. Zelomek, president, International Statistical Bureau Inc., New York city.



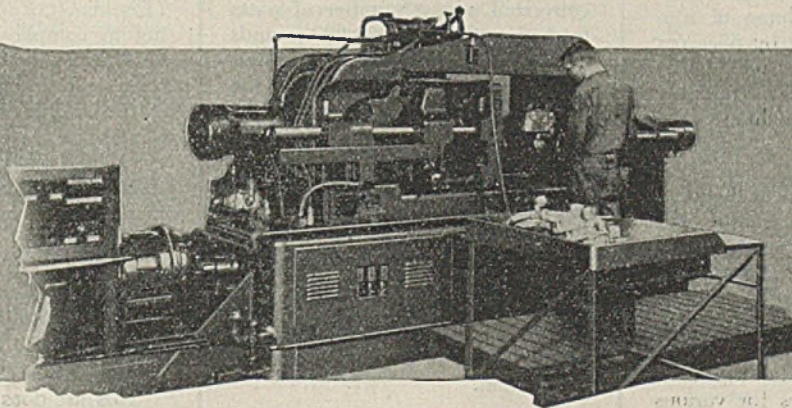
AUTO-LITE takes pride in producing aircraft die castings that are "Denser . . . Stronger . . . More Uniform"

Above you see a few examples of the many aircraft parts produced by the Alemite Die Casting Division of Electric Auto-Lite Co.

This organization makes a specialty of

providing *the densest, strongest and most uniform die castings obtainable.*

Many parts must pass 100% X-ray inspection for freedom from porosity.



AUTO-LITE uses a large battery of the most modern *Super Pressure* Die Casting Machines

Above is one of Auto-Lite's Lester-Phoenix Die Casting Machines. The metal can be injected at pressures of 22,000 to 30,000 pounds per sq. in.

This calls for a machine *built to confine these extremely high pressures to the die cavities.* The Lester-Phoenix has a non-elastic beam type cast steel frame, with 360% greater sectional area for holding the dies closed. Also quicker die adjustment, auto-

matic electric timing, and other exclusive features.

Write us for help in improving *your* die castings. Our experience as pioneers in high-pressure injection is yours for the asking. Send us a print of any die cast part—or better yet, send us a sample.

LESTER-PHOENIX, INC.

2711 CHURCH AVENUE, CLEVELAND 13, OHIO

Have you read "Factors to be Considered in Designing Die Castings," by Herbert Chase? We'll be glad to send you a copy.

LESTER-PHOENIX

DIE CASTING MACHINES

HIGHER PRESSURES *make*
STRONGER CASTINGS

Argentine Steel Supply Shrinks With War Limiting Importations

Possibilities for developing local metallurgical industry studied but prospects are dimmed by absence of suitable range of raw materials. . . Nation produced 80,000 tons in 1942 while average year prewar imports totaled 650,000 tons

ARGENTINA is passing through a period of extreme shortage of many important products, but chief difficulties are now developing in iron and steel supply.

Until recently, the country depended 100 per cent for its steel supplies on imports. But since prewar days the import situation has steadily deteriorated and, in view of the present relations between Argentina and the United States, imports are bound to decrease rather than increase.

For many months, Sweden has not been able to ship goods to South America owing to lack of the necessary documentation from the belligerents; in June last, many Swedish ships were permitted to sail again for South America carrying—among other material—hardware, machinery, and other products of iron and steel. Nevertheless, the volume of iron and steel imported dropped by 53.1 per cent during January-July, 1943, compared to January-July, 1942, while the reduction in the field of machinery and vehicles was 71.1 per cent.

Decline in Foreign Shipments

Since 1940, continental Europe has ceased to be a supplier of importance for Argentina, and since 1942, occasional Japanese shipments of iron and steel products have not been available. England, although doing her utmost to keep Argentina supplied with vital products, has had to reduce her sales for various reasons including lend-lease arrangements with the United States. The United States collaborated in keeping Argentine stocks on a satisfactory level during 1941 and even 1942; lately, however, quotas particularly in iron, steel, and machinery have been greatly reduced.

It is surprising that a real shortage of these products had not made itself felt in Argentina until a few months ago—about the end of 1942. The rapid increase of prices owing to the intervention of intermediaries who were able to buy up considerable supplies from American exporters, including sizes which could not be used for war orders, was cause for considerable concern.

During 1942, many of the smaller American manufacturers had not yet been organized for war work, and their output was available for export. Argentine importers were ready to pay high prices, but as government departments insisted on paying no more than official maximum, public tenders went begging.

On the basis of imported semimanufactured goods, and making use of the large stocks of scrap iron, the Argentine iron and steel industry has made good progress since 1940. Recently, however, apprehensions have been voiced that the industry would have to reduce its working hours owing to the lack of raw ma-

PINCH HITTER

Steel is saving 559,000,000 pounds of aluminum and copper by pinch hitting for these metals in a wide range of war weapons redesigned by Army ordnance, the American Iron and Steel Institute reports. Revising specifications for countless items from tanks to bullet cores, ordnance engineers have converted a vast number of parts to steel so that 440,000,000 pounds of copper and 119,000,000 pounds of aluminum will be saved over the two year period 1942-1943. The most spectacular saving is as a substitute for copper and its alloys in artillery cartridge cases, replacing brass—a feat which took the Germans years of experimentation. American steel producers accomplished it in six months. The saving in aluminum by substituting steel is equivalent to about 10 per cent of current aluminum production.

terials and the breakdown of its machinery for which spare parts are not available in satisfactory quantities to meet Argentina's needs.

The number of workers employed by Argentina's metallurgical industry as a whole was, nevertheless, not larger during the first seven months of 1943 (111.5% of 1937) than during the same period of 1940 (111.3) but the index-figure of wages paid (133.7) reflects not only the 10 per cent rise of the wage rate but (111.4 in 1940) an extension of working hours.

Developments concerned with the production of machinery seem less favorable (index-figure for workers employed: 103.2 in 1943 against 105.7 in 1940; and for wages paid 113.9 against 108.3); but these figures include the reduction of activity in the automobile plants. The yield and rate of profit of practically all factories has been extremely satisfactory.

Among the most important manufacturers of products of iron and steel, in Argentina, are the following:

Compania Argentina de Talleres Industriales Transportes y Anexos (C. A. T. I. T. A.) with about 2500 workers. It specializes in railway, streetcar and bus material, and construction. Other articles are equipment for air-conditioning, electric stoves, boilers, turning lathes.

S.I.A.M., Sociedad Industrial Americana Maquinaria Di Tella Ltda., with about 4000 workers. Production includes electric motors, transformers, pumps for water and petroleum, refrigerators, fans and similar material—partly as a concessionary of Westinghouse.

Talleres Metalurgicos San Martin (Tamet) with about 3000 workers, belonging to the Tornquist group, and formerly connected with the Luxemburg "Arbed". Main products: Wire and barbed wire, sheet iron, T.-U. iron, cast-iron pieces.

Ferrum, with 1100 workers, specializing in enameled iron.

Fabrica de Aceros y Lamincacion de Hierro Crefin (Quilmes), a more recent venture which promises to turn out heavy steel parts totaling up to 4000 tons per month. A 40-ton flywheel has already been delivered to an Argentine industrial plant.

Establecimientos Industriales "FEBO" (Fischbach, Enquin & Siedler) specializing in complicated machinery for local industries and in repair work not usually done in the country, 500 workers.

Muller & Sigrist pumps and cranes. La Cantabrica (Haedo) Iron-and-steel foundry, 1000 workers. Capacity: Fifty to 100 tons of steel and iron and steel semi-manufactured products.

Important Plants at Rosario

Pedro Merlini & Hijos, 400 workers. Schena & Santi specializing in electric motors. Castor, Talleres Metalurgicos specializing in oil presses.

This list does not include those plants which manufacture cans from tin plate; also not included are important plants at Rosario, the best known among the latter being:

Jose Cavalletto & Bros. and Muneratti Hnos & Cia, both specializing in machinery; Knut Sylwan, producing pumps, and Colombres & Cia turning out enameled ware, tubes, iron sheets, etc.

For a long time, Argentine economists have studied the possibilities for a real metallurgical industry making use of local iron ore deposits. Although it may be taken for granted that Argentine steel could never compete commercially with steel produced overseas or even in Brazil, Argentine steel production rose from 50,000 tons in 1941 to 80,000 tons in 1942. Average imports amounted to 650,000 tons in the years preceding the war. No solution has been found, so far, for the question how Argentine coal could be procured in satisfactory quality and quantity for reduction of iron in blast furnaces.

AFA Plans War Congress at Buffalo in April

Several interesting symposia and foundry show of materials, equipment to highlight session

CONGRESS of American Foundrymen's Association will be held at Buffalo, April 25-28, 1943, seeking answers to pressing problems of control, production and quality.

With castings now recognized as the No. 1 critical material, the forty-eighth annual meeting of the group will be held in conjunction with a foundry show of materials, equipment and supplies. The entire program will be staged at the new Memorial Auditorium in Buffalo.

There will be a symposium on malleable iron specializing in heading and gating, another for steel men covering shop practices, melting practice, heat treatment and sand control, and a third on centrifugal casting developments.

Dr. H. W. Gillett, chief technical advisor, Battelle Memorial Institute, Columbus, O., will deliver the annual foundation lecture. His subject will be "Cupola Raw Materials."

Manganese bronze castings work will be stressed at the brass and bronze meetings due to the increasing use of alloy castings in meeting wartime demands. Postwar problems facing the foundry industry will be another of the highlights of the meeting.

New England Conference At Boston, Nov. 18-19

Lt. Gen. Brehon B. Somervell, commanding general of the Army Service Forces, will be one of the principal speakers at the governors' session of the second New England War Conference at Boston, Nov. 18-19.

Charles E. Wilson, executive vice chairman of the War Production Board, and W. Clifford Townsend, deputy assistant to War Food Administrator Marvin Jones, will also speak before the group.

SPWA Plans for Large Crowd at Nov. 19 Meeting

More than 200 steel warehousemen and mill representatives have made arrangements to attend the annual meeting of the Steel Products Warehouse Association Inc. at the Drake Hotel, Chicago, Nov. 19.

In addition to a morning session of detailed examination of problems and

conditions affecting the distribution of steel warehouse products under WPB and OPA regulations, and a timely presentation on renegotiation proceedings, the afternoon program features an outstanding group of government officials speaking on manpower controls, CMP, warehouse regulations, price schedules, and steel redistribution.

Mill Supply Group To Meet in Chicago, Nov. 15

Discussions relating to renegotiation of contracts, contract terminations, personnel relations, salary stabilization, and manpower will be the highlights of the eleventh annual meeting and second war conference of the Central States Mill Supply Association at the Palmer House, Chicago, Nov. 15.

Lincoln To Speak Before Purchasing Agents, Nov. 18

James F. Lincoln, president, Lincoln Electric Co., Cleveland, will speak on "Government by Formula" at the Nov. 18 meeting of the Purchasing Agents Association of Chicago at the Hotel Sherman, Chicago.

Chicago Chapter of Metal Makers To Meet Dec. 4

Electric steel melting practice will be discussed at a meeting of the Chicago section of the Electric Metal Makers Guild Inc. at the Morrison hotel, Chicago, Dec. 4.

A joint meeting of the ingot and castings section will be held in the morning and in the afternoon there will be separate panel discussions for the ingot casting sections. A. J. Scheid, Columbia Tool Steel Co., Chicago Heights, Ill., will be chairman of the meeting.

Texas Chapter Seeks Admission to AFA

Petition for admission as the twenty-fifth chapter of the American Foundrymen's Association was approved by the 110 foundrymen present at a Texas area chapter meeting in Houston, Tex., recently.

The organization work, initiated at the St. Louis Foundry Congress last April, is being carried on by a Texas committee head by F. M. Wittlinger, Texas Electric Steel Castings Co., Houston. J. O. Klein, Texas Foundries Inc., Lufkin, serves as vice chairman, and H. L. Wren, Barada & Page Inc., Houston, as secretary.

California Chapter of Scrap Institute Elects Officers

Marshall A. Shapiro, California Scrap Iron Corp., Oakland, Calif., was re-

elected president of the Northern California chapter of the Institute of Scrap Iron and Steel at a recent meeting.

Vernon Barker, Steel Mill Supply Co., Sacramento, Calif., was re-elected vice president and Harold T. Levin, Salco Iron & Metal Co., San Francisco, secretary-treasurer.

BRIEFS . . .

Shafer Bearing Corp., Chicago, has moved into new headquarters at 1412 West Washington boulevard, Chicago.

Tennessee Coal, Iron & Railroad Co., Birmingham, recently honored a number of its employes with from 25 to 50 years of service with the company.

Detroit Tap & Tool Co., Detroit, has published an eight page technical bulletin, No. HC-43, describing the new universal hook checker.

Sun Oil Co., Philadelphia, has issued a booklet on industrial greases.

H. K. Ferguson Co. Inc., Cleveland, is building a detinning plant at Birmingham. It will be completed early in 1944.

Jam Handy Organization, Detroit, has available a new type of catalog-directory which classifies a wide range of visual aids suitable for training in the metals and machinery field.

Koppers Co., Pittsburgh, has purchased the assets of Coated Products Corp., Verona, Pa.

General Electric Co., Schenectady, N. Y., has saved more than 850,000 pounds of tin since Pearl Harbor as a result of changes adopted by the company in its solders and babbitt alloys.

MEETINGS' CALENDAR . . .

American Zinc Institute: Galvanizers committee wartime conference at the William Penn hotel, Pittsburgh, Nov. 17-18.

National Founders Association: Forty-sixth annual meeting at Waldorf-Astoria hotel, New York city, Nov. 17-18.

Purchasing Agents Association of Chicago: Meeting at the Hotel Sherman, Chicago, Nov. 18.

New England War Conference: Governor's session to be held at Boston, Nov. 18-19.

Steel Products Warehouse Association: Annual meeting at Drake hotel, Chicago, Nov. 19.

American Society of Mechanical Engineers: Annual meeting at Pennsylvania hotel, New York city, Nov. 29-Dec. 3.

Electric Metal Makers Inc.: Chicago section to discuss electric steel melting practice at the Morrison hotel, Chicago, Dec. 4.

Exposition of Chemical Industries: Nineteenth exposition to be held at Madison Square Garden, New York city, Dec. 6-11.

American Society of Refrigerating Engineers: Thirty-ninth annual meeting at Benjamin Franklin hotel, Philadelphia, Dec. 7-9.

Society of Automotive Engineers: Annual meeting and engineering display at the Book Cadillac hotel, Detroit, Jan. 10-14.

American Foundrymen's Association: Third war production foundry congress at Buffalo, April 25-28.

MEN of INDUSTRY

Charles B. Konselman, formerly sales promotion manager, Royal Typewriter Co., New York, has joined Wickwire Spencer Steel Co., New York, as advertising manager. Mr. Konselman succeeds George L. Randall, who recently was commissioned a lieutenant (j.g.) in the United States Naval Reserve.

Robert B. McColl, vice president in charge of manufacturing, American Locomotive Co., New York, has been elected a director of the company.

Reuel E. Warriner has completed an assignment with the Tank Automotive Center of the Army Ordnance Department and is resuming his duties with International Nickel Co. Inc., New York, supervising the movement of nickel required by the steel industry.

E. G. Plowman, formerly traffic manager, Colorado Fuel & Iron Corp., Denver, has been named vice president in charge of traffic, United States Steel Corp., Pittsburgh, and will assume his duties Jan. 1, 1944.

George A. Mohlman, president, Package Machinery Co., Springfield, Mass., has been named president, Packaging Machinery Manufacturers' Institute, succeeding Wallace Kimball, Standard Knapp Corp, Portland, Conn.

John J. Simpson, formerly a representative in the Pittsburgh area for Jenkins Bros., New York, has been appointed general sales manager, Pittsburgh Gage & Supply Co., Pittsburgh.

Daniel C. Teetor, a director and former general factory manager of Perfect Circle Co., Hagerstown, Ind., has been elected vice president in charge of all manufacturing operations of the company. William B. Prosser succeeds Mr. Teetor as general factory manager and William J. Cramer succeeds Mr. Prosser as manager of the Richmond (Ind.) plant.



C. B. KONSELMAN



GERALD CARLISLE



DR. N. I. BAUM

Robert M. Thomas has been appointed sales manager of the company's Automotive Equipment division, and Charles E. McTavish has been named to succeed Mr. Thomas as general manager and secretary, Perfect Circle Co. Ltd., Toronto. Mr. Thomas continues as vice president and a director of the Canadian company.

Gerald Carlisle has been named controller and assistant treasurer, Micro-matic Hone Corp., Detroit.

Ward Wire, vice president, Colorado & Wyoming railroad, subsidiary of Colorado Fuel & Iron Corp., Denver, has been named traffic manager of the parent company and retains his present position.

James B. Rosser has been appointed administrative assistant, Pullman-Standard Car Mfg. Co., Chicago, reporting directly to the president.

C. B. F. Macauley has joined Fairchild Engine & Airplane Corp., New

York, as assistant to Joseph E. Lowes Jr., director of public relations.

Dr. Nathaniel L. Baum has joined Turco Products Inc., Los Angeles, as head of the company's newly-opened organic research laboratory.

Roy C. Kendall has been appointed Milwaukee sales representative, Poole Foundry & Machine Co., Baltimore.

Glenn E. Winton, former chief quality engineer, Minnesota Mining & Mfg. Co., St. Paul, has joined the technical staff of Midwest Abrasive Co., Detroit, as quality engineer, Coated Abrasive division.

J. Murray Whitworth has been appointed a sales representative in the Pittsburgh area for Jenkins Bros., New York.

W. F. Newbery, previously South Central region manager, Dayton, O., Detrex Corp., Detroit, has been appointed sales manager of the company's Industrial division.

Frederick E. Hanson has been appointed superintendent of manufacturing engineering, Western Electric Co., Kearny (N. J.) works.

A. C. Hoffmaier has been named assistant treasurer, American Ship Building Co., Cleveland.

Edwin W. Seeger, director of development, Cutler-Hammer Inc., Milwaukee, has been elected president of the Engineers' Society of Milwaukee.

James E. Webb, former secretary and treasurer, Sperry Gyroscope Co. Inc., Brooklyn, N. Y., has been elected vice president. Mr. Webb continues as secretary, but is succeeded as treasurer by F. W. Kilduff.

Fred T. Turner and Page A. Mead have been assigned to special work at Cleveland headquarters of Osborn Mfg. Co. Replacing Mr. Turner as company



L. F. MCGLINCHY

Who has been appointed assistant manager of operations, Pittsburgh district, American Steel & Wire Co., Cleveland, noted in STEEL, Nov. 8, p. 86.



JAMES R. WEAVER

Who has been named manager of the Naval Ordnance plant, Center Line, Mich., which is under Westinghouse management, as announced in STEEL, Nov. 1, p. 74.



FLOYD ROSE



W. R. MOORE



JOHN DUNN

representative in Pittsburgh is Presley Katz, and succeeding Mr. Mead in eastern New York is Dean M. Boundy. Lloyd H. Ross succeeds Mr. Katz in Chicago.

Floyd Rose, who joined Vanadium-Alloys Steel Co., Latrobe, Pa., in 1926 as vice president, has been elected president of the company. Roy C. McKenna, a former president of Vanadium-Alloys, was elected chairman of the board, and James P. Gill was elected vice president.

Dr. Frank C. Croxton has been named supervisor of organic chemistry, Battelle Memorial Institute, Columbus, O.

H. C. Coffey, formerly manager of sales, Aetna-Standard Engineering Co., Youngstown, O., has been elected vice president in charge of sales and production.

T. S. Mellen has been appointed district manager for the new South Bend, Ind., branch office (601 Tower building), Michigan Tool Co., Detroit, and E. W. Brock has been named district

manager of the new Cincinnati office, 1409 Union Central Life Insurance building.

William R. Moore, former general sales manager, Abrasive division, Norton Co., Worcester, Mass., has been named a vice president of Norton Co.

John Dunn has been appointed works manager, Titeflex Metal Hose Co., Newark, N. J. Succeeding Mr. Dunn as production manager is Arthur F. Pennington, former superintendent of plants at Titeflex.

William Campbell has joined the Chicago district sales office of Inland Steel Co., Chicago, and will handle a portion of the Iowa territory.

J. M. Darbaker has been appointed assistant manager of Chicago district operations, Carnegie-Illinois Steel Corp., subsidiary of United States Steel Corp., Pittsburgh, succeeding R. G. Glass, who recently has become vice president and general manager of United States Steel Corp.'s new subsidiary, Geneva Steel

Co., Provo, Utah. Charles A. Ferguson succeeds Mr. Darbaker as general superintendent of the Gary (Ind.) Sheet and Tin Mill.

Albert H. Pfeiffer, personnel manager, Harnischfeger Corp., Milwaukee, has entered the administrative offices of the Navy Department and has been commissioned lieutenant commander.

OBITUARIES . . .

Henry L. Grede, 78, a director and one of the organizers of Grede Foundries Inc., Milwaukee, died Nov. 5.

Bud H. Rader, 64, vice president, Lehigh Portland Cement Co., Chicago, died Nov. 7 in that city.

Charles Greenwald, 74, former owner of the Greenwald Iron & Metal Co., Sacramento, Calif., died recently in Redwood City, Calif.

Robert Reid, 71, co-founder, Reid Bros. Co. Inc., Beverly, Mass., died there Oct. 30.

G. Denton Myers, vice president and director, F. E. Myers & Bro. Co., Ashland, O., died there recently.

Noble Calhoun Banks, 71, retired president, Gear Grinding Machine Co., Detroit, died Oct. 30 in Palm Springs, Calif.

David Beccroft, 68, vice president, Bendix Products division, Bendix Aviation Corp., South Bend, Ind., died Nov. 5 in that city.

Samuel M. Havens, 66, vice president, Ingalls-Shepard division, Wyman-Gordon Co., Harvey, Ill., died in Chicago Nov. 4.

George D. Moloney, 36, vice president and general manager, Lion Mfg. Corp., Chicago, died there Nov. 4.

M. W. Rogers, president, Universal Unit Machinery Corp. and Davis & Thompson Co., Milwaukee, died in Chicago Nov. 4.

Edgar V. O'Daniel, 59, vice president and director, American Cyanamid Co., New York, died there Nov. 4.

Jacob J. Ripner, 57, founder and president of Aluminum Smelting & Refining Co., Cleveland, died Nov. 6.

Homer Littlefield, 66, manager, mining department, Marion Steam Shovel Co., Marion, O., died Oct. 17 in Columbus, O.

Daniel J. Ryan, 79, founder and president, Allyne-Ryan Foundry Co., Cleveland, died Nov. 8.



DAVID A. NELSON

Who has joined Detroit Broach Co., Detroit, as vice president and general manager of the company's West Coast plant, noted in STEEL, Nov. 8, p. 87.



RAY W. TURNBULL

Who has been elected president, Edison General Electric Appliance Co. Inc., Chicago, subsidiary of General Electric Co., as announced in STEEL, Nov. 8, p. 86.

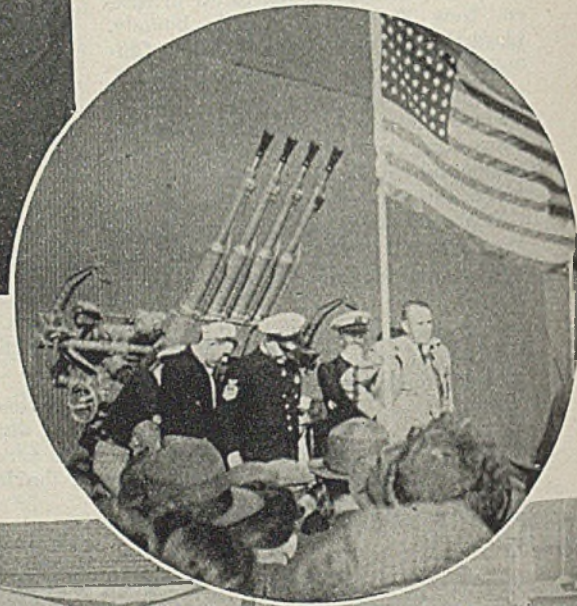
PRODUCTION

By M. F. BALDWIN
Assistant Editor, STEEL

Below, V. H. Lawrence, general superintendent, Otis Works, Jones & Laughlin Steel Corp., Cleveland, speaks to the 600 employes attending the Navy's "Steel for Victory" rally



Above, As a vital factor in inspiring employes not able to leave their work, members of the "Steel for Victory" Navy unit visit every department for personal chats with the workers



Below, Part of the crowd of steelworkers attending the Navy rally at Copperweld Steel Co., Warren, O.



SPURRED BY VICTORY DRIVE

Management and labor co-operate with Navy to boost output through plant rallies at which battle veterans tell workers of their experience and factual exhibits demonstrate vital role steel plays in winning the war

THE three-pronged "Steel for Victory" drive for 2,000,000 additional tons of steel before 1944 seems headed for outstanding success. Begun in midsummer, the drive has three important phases: Procurement of extra steel from nonessential or less essential projects which can be canceled; steel from new facilities just completed, and additional steel from present facilities.

Management and labor have co-operated so cordially in efforts to increase production in existing plants that this division of the drive is making especially notable progress. Among important measures employed to increase tonnage the Navy's "Steel for Victory" program deserves prominent place.

Most difficult "speed up" problem has been the all-important human element. How can a furnaceman, for instance, working on the same job producing practically the same products as in peacetime, be induced to work harder or faster? How can he be made to real-

ize the direct connection between his intensified efforts and winning the war?

The Navy has the answer—an answer so effective it increased by nearly 800 tons the weekly output of one large steel mill. Not only is this a saving of 50 hours melting time but it provides sufficient metal to manufacture about 225 of the "Chicago piano," or 1.1 quad anti-aircraft gun, shown in the accompanying illustration. And this "tonnage stimulator" is available to every steel plant filling orders for the Navy.

Psychology Does the Job

Sound psychology is the entire basis of this "speed up" project. To make that clear, let's examine the probable mental makeup of an average steel mill worker.

His job is "old stuff" to him; he has been working at it for some ten years. When war was declared his duties didn't change to any extent. He sees the same products being shipped out every day,

just as in peacetime. His son is in service, but the relationship between the boy's safety and the father's daily work seems so indirect it has not influenced this steelman's working attitude.

Wartime conditions have also made this employe a bit dissatisfied with his setup. A few months ago his wife took a war plant job, at an hourly wage rate above his. His top place as main family provider has been usurped. He may not hunt employment elsewhere, but the idea of his wife's higher pay rankles just the same.

So here's a rough average of the human factor with which the plant management must deal: A worker who feels little or no "war urge" because his peacetime work continues unchanged, and who is none too satisfied with his wages. Can such workers be induced to put greater effort into a hot, laborious job day after day and increase the plant's tonnage?

"Yes," says the Navy, "if you employ the right psychology. Don't browbeat or threaten them. Instead, place the actual facts before your employes. Show them what ships or guns are being built with the company's steel. Convince them that lower tonnage means fewer of those products—which may mean that their son or other relative in service may lose his life. Let them talk face to face with returned overseas veterans who have operated equipment made from the company's steel; and hear, for instance, how tough plate from their plant helps keep our gun turrets firing while Japanese ship plates crumple. Prove to employes that their steel DOES directly affect the war effort—they'll do the rest!"

Sounds reasonable on paper. But the Navy doesn't end its efforts with theory. Its Industrial Incentive Division, presided over by Rear Adm. C. H. Woodward, offers dozens of ideas for stimulating production in steel plants, most important for the current steel drive being the "Steel for Victory" program. The Navy terms it the "Steel for Victory" exhibit—but the work done extends so far beyond the actual exhibit that the label is a misnomer.

In charge of the mobile unit is Lt. Richard M. Kelly, USNR. As might be expected in an officer assigned to such a mission, he is forceful, energetic, and tactful. His one and only objective is to co-operate with management and labor to increase steel mill tonnage.

Traveling with the unit are six Navy enlisted men, all returned from overseas combat service within the past few weeks. These fighting men have sacrificed most of their shore leave to serve with this unit because they consider it a



These six Navy combat veterans, now sacrificing the greater part of their home leave in effort to increase steel production, will shortly be replaced by other Navy veterans when they return to combat service. The men are: First row, Gunner's Mate (1st class) T. J. McGinnis; Turret Captain (1st class) T. A. Adams; Gunner's Mate (1st class) J. A. Sebastian; second row, Chief Gunner's Mates V. R. Pulliam, C. F. Flynn, G. L. Maginnis

genuine contribution toward stimulating production of more steel. Comprising the present group are three chief gunner's mates, two gunner's mates, and a turret captain. About every six weeks the men are replaced with six others just back from combat areas.

The exhibit consists of three three-ton panel trucks—painted red, white, and blue—in which all personnel and equipment are transported. When the exhibit is set up the panels, covered with combat photographs faced inward while trucks are en route, are removed and placed on the ground against each truck to serve as additional spots of interest.

Focal point of the exhibit is the truck carrying the "Chicago piano," officially known as the 1.1 quad antiaircraft gun, which saw so much action in the South Pacific. This truck, placed between the other two, serves adequately as a speakers' stand.

The second truck features a Navy torpedo with sections of outside casing cut away to display the internal mechanism. On this truck are also shown a section-alized depth charge; depth charge projector, or K gun; depth charge arbor, and complete sea mine. On the third truck are displayed German, Japanese, and Italian machine guns, field rifles, grenades, mortar projectiles, land mines, and aerial bombs. Two especially interesting items are an eight-inch Japanese projectile which imbedded itself in the U.S.S. BOISE during the engagement in which that ship sank six Jap warships, and a fragment of a 1875-pound bomb dropped on the U.S.S. TENNESSEE by the Japanese during the Pearl Harbor sneak raid.

Project Aably Planned

The sound psychology behind the "Steel for Victory" program is not confined to production thoughts put across to steelworkers; it is equally evident in advance arrangements for the program. Lieutenant Kelly gets full co-operation of both management and labor as sponsors of the program, usually through the plant's Labor-Management Committee.

Plans laid in advance of the program's presentation are notably thorough, and show further application of good psychology to "sell" the idea of greater tonnage. For example, the labor-management committee furnishes Lieutenant Kelly a complete list of the products turned out by each department. This serves two vital purposes. First, the Navy speakers can mention in their messages the items of particular interest to company employes. Second, when Navy men go through the plant to talk with small groups of workers who cannot leave their posts they discuss items these men are working on and thereby establish a common ground of interest.

As the overseas veterans related their experiences at Otis Works, Jones & Laughlin Steel Corp., I watched these steelmen. Their somewhat skeptical expressions became more cordial as the fighters narrated their activities in simple terms. After the brief discussion,

as the Navy men moved along to the next group, they were warmly applauded for what had clearly been a convincing presentation. To these steelworkers the personal visit meant much more than listening to speeches out at the exhibit; now they had a really vital reason for working harder to get out the steel.

The main program was staged before an audience of roughly 600 steelworkers,

FOLLOW-UP WORK

Benefits of the "Steel for Victory" program are tangible as borne out by comments from management. But, as pointed out by the Navy, one vital point should be stressed: A psychological "shot in the arm" will not pay dividends indefinitely. Steel mills reaping continued higher tonnage are those whose personnel departments have seen the necessity of vigorous follow-up work to sustain the enthusiasm generated by the Navy program.

Such production spurs as interdepartmental contests; full-color posters; paycheck enclosures; Navy performance communiques on the company's products; action photographs; combat motion pictures; articles in house magazines and labor papers and many other measures pay richly in sustaining the intensive level of mill employes' will-to-work attained through the Navy presentation.

Information on these and other aids may be secured by addressing the Industrial Incentive Division, 2118 Massachusetts avenue, N.W., Washington.

office employes, and plant executives. Properly enough, attention was focused on the comments made by the six enlisted men, although the general superintendent spoke for about three minutes and so did the union head.

The entire program was over in about an hour.

The brief remarks by Lieutenant Kelly and each of the veterans sparkled with shrewd psychology. "If enemy planes were to invade our land," said the lieutenant, "they would head straight here—to destroy this plant, kill you, halt steel production. If they could do that they might have a chance to defeat us." Gunner's Mate McGinnis, after describing his comrades' deaths around him as the ship sank, concluded, "Keep the home fires burning—in your furnaces—and I promise you that the boys out there will keep the gunfire burning into our enemies until they call it quits."

Chief Gunner's Mate Pulliam, returned from the "Murmansk Express" run, drove home the point in this fashion: "On one occasion along that hellish route to Murmansk I saw the better part of a

whole convoy go down. There must have been well over 100,000 tons of steel sent to the bottom in a few hours. Consider what that means in terms of replacements! Multiply it a hundred times over by the steel we'll need to replace other ships that will meet the same fate before this war is through.

"Yes, think it over and then go back to the big job you've got ahead of you. Go back fighting mad so I can tell my shipmates when I return, 'Don't worry, fellows—whatever steel we're going to need we're going to get!'"

Does the program actually increase tonnage? Outstanding evidence on this point is furnished by a large steel plant which had been averaging 6894 net tons per week for seven weeks prior to the visit of the Navy group. That week the mill's production jumped to 7680 tons—an increase of 786 tons, or 12.8 per cent.

Reactions Are Favorable

How have management and labor reacted to the Navy's "Steel for Victory" program and its results? The following are a few quotations from letters from both management and labor:

CARNEGIE-ILLINOIS STEEL CORP., Clairton, Pa.: "It is conservatively estimated that 6650 people viewed the exhibits and attended the rallies throughout the day and night. We feel certain that the program really put across to the employes the necessity for harder work, more hours, less absenteeism, and increased production."

AMERICAN ROLLING MILL CO., Butler, Pa.: "Approximately 2500 of our employes saw the exhibit and listened to the rallies. Everyone expressed their feeling that more good was received from this exhibit than from any previous program we have had at the plant."

LOCAL UNION NO. 2243, Copperweld Steel Co., Warren, O.: "After this program the employes realized the important part that steel is playing in the war. I know the employes of Copperweld Steel Co. will double their efforts to do all in their power to aid our armed forces with ample supplies of steel."

COPPERWELD STEEL CO.: "The leaders of our labor-management committee were particularly impressed with the way in which the entire program was accepted by our workers, and they feel that the inspirational effect created by your group will continue for many weeks."

REPUBLIC STEEL CORP., Youngstown, O.: "Most of the departments in this district were running at record rates for the month at the time of your visit. All of these nine major departments have maintained or bettered their rates since your visit."

MAHONING VALLEY STEEL CO., Niles, O.: "In a plant such as ours where the work is hard and hot, such an exhibit does an untold amount of good and helps keep the spirit of the men up. From the expressions of the men, we know there will be quickening of spirits that will result in more production."



Centrifugal Castings Division of Shenango-Penn Mold Co., Dover, O., receives, left, the "E" award. Photograph shows H. S. Bradley, president of the company, accepting the pennant from Comdr. A. G. Mumma, Bureau of Ships

Below, employes of Cleveland Worm & Gear Co. and the Farval Corp., Cleveland, have been awarded the Army-Navy "E." Shown holding the pennant, left to right: Comdr. H. H. Keith, Bureau of Ships; A. J. Jennings, vice president in charge of sales; George H. Acker, vice president in charge of engineering; and Howard Dingle, president

Additional War Plants Receive Production Awards

The Army, Navy and Maritime Commission announced recently the presentation of production awards to the following companies:

- Kerotest Mfg. Co., Pittsburgh, awarded second gold star for Maritime "M" pennant.
- Ransome Machinery Co., Dunellen, N. J.
- Bullard Co., Bridgeport, Conn., receives third award.
- Lewis Foundry & Machine Co., Pittsburgh, receives renewal.
- Phelps Dodge Copper Products Corp., Tube division, Los Angeles, receives Maritime "M" award.
- Anderson Tool & Mfg. Co., Chicago.
- Appalachian Mills Co., Knoxville, Tenn.
- Avey Drilling Machine Co., Covington, Ky.
- Beloit Iron Works, Beloit, Wis.
- Binks Mfg. Co., Chicago.
- Buffalo Bolt Co., North Tonawanda, N. Y.
- Gellman Mfg. Co., Rock Island, Ill.
- Mines Equipment Co., St. Louis.
- Mississippi Foundry Corp., Rock Island, Ill.
- Pacific Coast Borax Co. plants at Boron and Wilmington, Calif.
- Read Machinery Co., York, Pa.
- Sheet Metal Products Inc., Newark, N. J.
- Wiley Machine Co., Los Angeles.
- York Corp., York, Pa.
- Keokuk Electro-Metals Co., Keokuk, Iowa, receives first star.
- Davenport Besler Corp., Davenport, Iowa.
- Askania Regulator Co., Chicago.
- Greenfield Tap & Die Corp., Greenfield, Mass., receives third award.
- T. J. Edwards Inc., Boston, Mass.
- Ordnance Gauge Co., Philadelphia.
- Radio Condenser Co., Camden, N. J.
- Southern Steel Works Co., Birmingham, Ala.
- Viking Refrigerators Inc., Kansas City, Mo.
- Lindberg Engineering Co., Chicago, awarded star.
- Fitzgibbons Boiler Co. Inc., Oswego, N. Y.



Ransome Machinery Co., Dunellen, N. J., receives the "E"; left to right: Leonard D'Amelio, veteran employe; Lieut. William Murphy, Navy; Vice President L. R. Wilson; Lieut. Col. Austin D. Smith, Army

THE BUSINESS TREND

Industry Alarmed Over Prospects of Inflation

CALL the coal miners' contract inflationary and you've said it all. Other large unions are already taking first steps toward securing higher wage rates. Defense of the Little Steel formula means little, for only the shell remains. With wage control shattered, how long price control can withstand pressure is anyone's guess.

As industry confronted a future offering explosive potentialities, motor transportation held the spotlight last week. Next year's manufacture of military transport vehicles will be heavy, and the industry's production of all types of military or industrial units may reach a million units. Office of Price Administration, in easing restrictions on output and distribution of parts for old cars, has recognized possibility of a critical decline in volume of civilian transportation unless the nation's home-front automobiles are kept rolling by needed repairs. Alfred P. Sloan, General Motors board chairman, glanced ahead into the postwar period and forecast the industry would be building approximately 6,000,000 cars per year.

MANPOWER—Though the problem of labor shortage is far from settled, clear evidence of progress is found in increased West Coast plane production. Several Middle West cities are testing voluntary labor-control plans. The War Manpower Commission's advisory committee, made up of management, labor, and agricultural leaders, has reported adversely on a national service act.

PLANE COMPANIES' ASSETS—Dwindling ratio of aircraft companies' current assets to current liabilities is shown in the accompanying chart, comparing the position of 23 representative corporations in 1939 and 1942. Ralph S. Damon, vice president, American Airlines Inc., recently testified before the House Ways and Means Committee an 8 per cent decline in value of assets of 11 leading plane companies, representing 75 per cent of the nation's aircraft output,

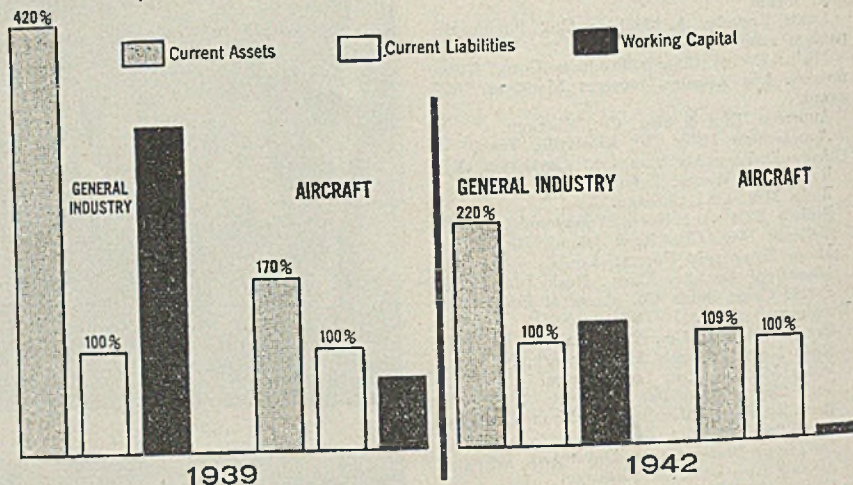
would wipe out stockholders' investments, while an 11.6 per cent drop in value of inventory would consume working capital.

OCTOBER CONSTRUCTION—Civil engineering construction volume in continental United States totaled \$193,379,000 for October, compared with \$264,285,000 in the preceding month and \$691,979,000 for October of 1942. Private construction, at \$47,314,000, slightly surpassed the September figure of \$46,308,000 and was far ahead of the October, 1942 total, \$37,041,000.

RAILROAD CARLOADINGS AND EMPLOYMENT—Revenue carloadings for the five weeks ending within October clearly illustrate the lines' problem of trying to increase volume while operating with worn equipment, fewer employes, and heavier traffic schedule. Carloadings for the current five-week October amounted to 4,518,044, for the 1942 period they were 4,511,609, and for the corresponding period in 1941 they totaled 4,553,007.

Latest figures on railroad employment, issued by the Interstate Commerce Commission, show class I lines have a total of 1,374,485 employes, a decrease of 0.32 per cent as compared with the preceding month. Each classification of employe showed an increase in number over a one-year period except maintenance of way and structures, this group recording a 3.18 per cent decrease.

**RATIO OF CURRENT ASSETS
(CASH, MARKETABLE SECURITIES, RECEIVABLES AND INVENTORIES)
TO CURRENT LIABILITIES
(ALL OBLIGATIONS DUE WITHIN ONE YEAR)**



FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity).....	99.5	99.5	99.5	98.5
Electric Power Distributed (million kilowatt hours).....	4,414	4,415	4,359	3,762
Bituminous Coal Production (daily av.—1000 tons).....	1,633	1,883	2,026	1,963
Petroleum Production (daily av.—1000 bbls.).....	4,389	4,383	4,324	3,838
Construction Volume (ENR—unit \$1,000,000).....	\$35.2	\$32.0	\$50.7	\$137.4
Automobile and Truck Output (Ward's—number units).....	19,585	19,135	21,265	20,180

*Dates on request.

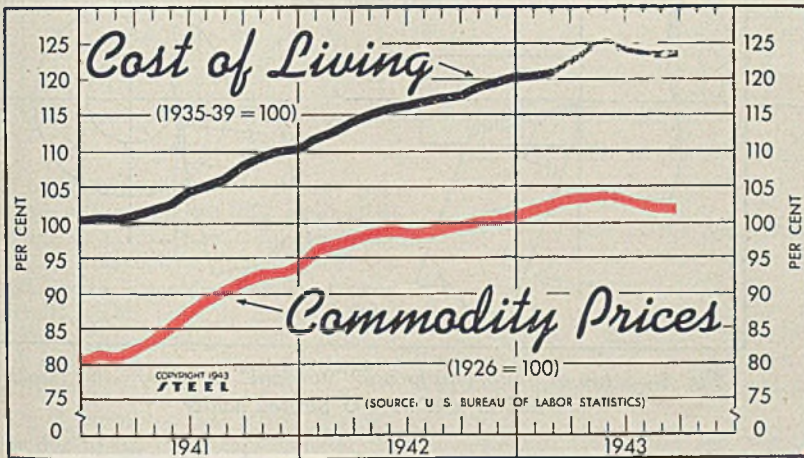
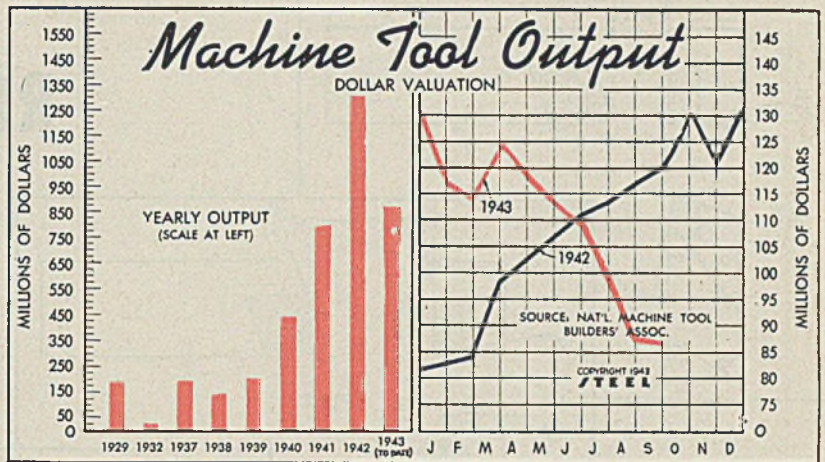
TRADE

	841†	884	911	827
Freight Carloadings (unit—1000 cars).....	42	49	42	136
Business Failures (Dun & Bradstreet, number).....	\$19,354	\$19,090	\$18,818	\$14,312
Money in Circulation (in millions of dollars)†.....	+12%	+13%	+17%	+18%
Department Store Sales (change from like week a year ago)†.....				

†Preliminary. ‡Federal Reserve Board.

Machine Tool Output
(000 omitted)

	1943	1942	1941
Jan.	\$117,384	\$83,547	\$50,700
Feb.	114,593	84,432	54,000
Mar.	125,445	98,358	57,400
Apr.	118,031	103,364	60,300
May	113,710	107,297	60,800
June	108,689	111,090	69,070
July	97,428	113,596	63,019
Aug.	87,405	117,342	70,069
Sept.	85,842	119,883	74,906
Oct.	...	130,008	84,178
Nov.	...	120,871	81,320
Dec.	...	131,980	81,435
Year	...	...	1,321,862
1942	...	...	812,462
1941	...	...	450,000
1939	...	...	210,000



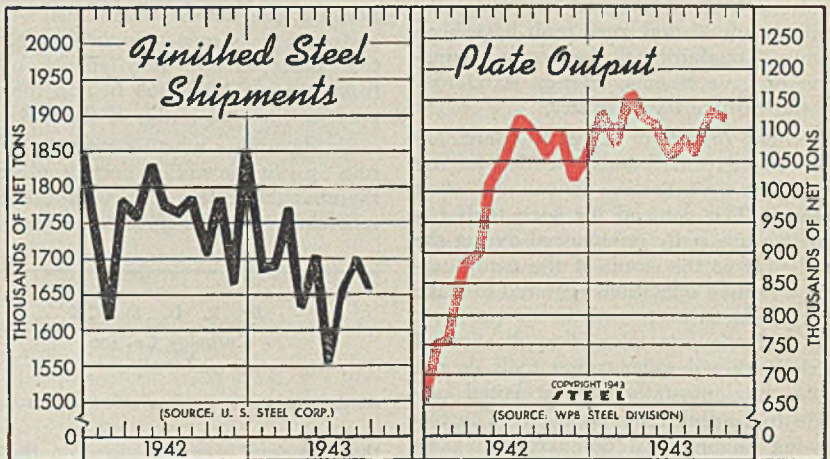
Wholesale Commodity Price—
Cost of Living Indexes

	Commodities— (1926=100)			Living Cost— (1935-39=100)		
	1943	1942	1941	1943	1942	1941
Jan.	101.9	96.0	80.8	120.6	112.0	100.8
Feb.	102.5	96.7	80.6	120.9	112.9	100.8
Mar.	103.4	97.6	81.5	122.8	114.3	101.2
Apr.	103.7	98.7	83.2	124.1	115.1	102.2
May	104.1	98.8	84.9	125.1	116.0	102.9
June	103.8	98.8	87.1	124.8	116.4	104.6
July	103.2	98.7	88.8	123.8	117.0	105.3
Aug.	103.1	99.2	90.3	123.2	117.5	106.2
Sept.	103.1	99.6	91.8	123.7	117.8	108.1
Oct.	...	100.0	92.4	...	119.0	104.3
Nov.	...	100.3	92.5	...	119.8	110.2
Dec.	...	101.0	93.6	...	120.4	110.5
Ave.	...	98.8	87.3	...	116.5	105.2

Steel Shipments†—Plate Production‡
(Unit 1000 Net Tons)

	Shipments—		Plate Output—	
	1943	1942	1943	1942
Jan.	1685.9	1738.9	1135.4	754.5
Feb.	1691.6	1616.6	1072.0	758.7
Mar.	1772.4	1780.9	1167.7	878.7
Apr.	1630.8	1758.9	1121.0	895.9
May	1706.5	1834.1	1114.9	1012.2
June	1552.7	1774.1	1059.3	1050.9
July	1661.0	1765.7	1089.0	1124.1
Aug.	1704.5	1788.6	1061.0	1097.9
Sept.	1664.6	1703.6	1161.0	1061.8
Oct.	1794.9	1787.5	1147.1	1101.4
Nov.	...	1665.5	...	1013.6
Dec.	...	1849.6	...	1060.0
Total	...	21,064.2	...	11,809.7

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



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—billions)	\$8,631	\$8,897	\$9,322	\$7,119
Federal Gross Debt (billions)	\$169.0	\$168.9	\$160.7	\$98.0
Bond Volume, NYSE (millions)	\$44.7	\$51.8	\$41.8	\$46.0
Stocks Sales, NYSE (thousands)	4,007	4,144	3,096	3,538
Loans and Investments (millions)†	\$52,982	\$53,477	\$50,124	\$37,549
United States Government Obligations Held (millions)†	\$39,218	\$38,682	\$35,947	\$23,786

†Member banks, Federal Reserve System.

PRICES

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average	\$56.73	\$56.73	\$56.73	\$56.73
Spot Commodity Index (Moody's, 15 items)†	244.8	247.2	248.7	233.7
Industrial Raw Materials (Bureau of Labor index)†	111.8	112.1	112.6	102.7
Manufactured Products (Bureau of Labor index)†	100.3	100.3	100.1	99.5

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

ROLLER TURNER TOOLS

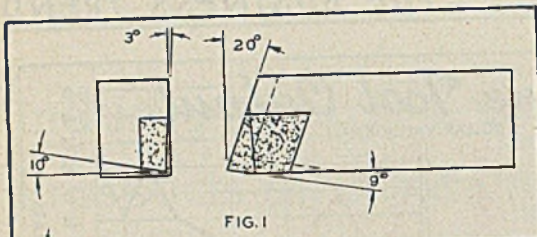


FIG. 1

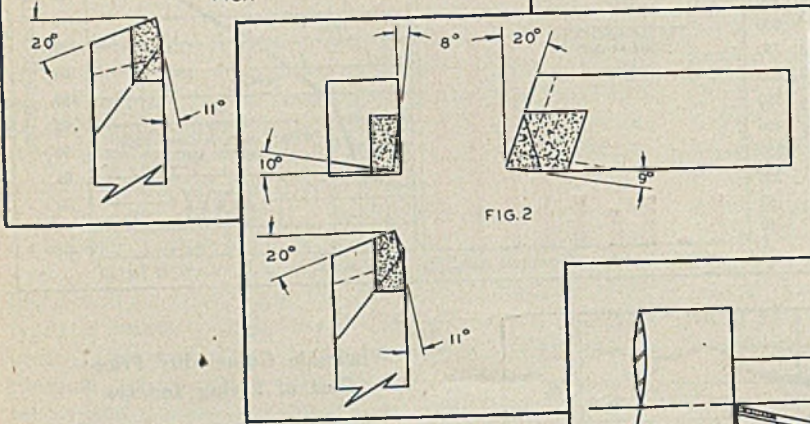


FIG. 2

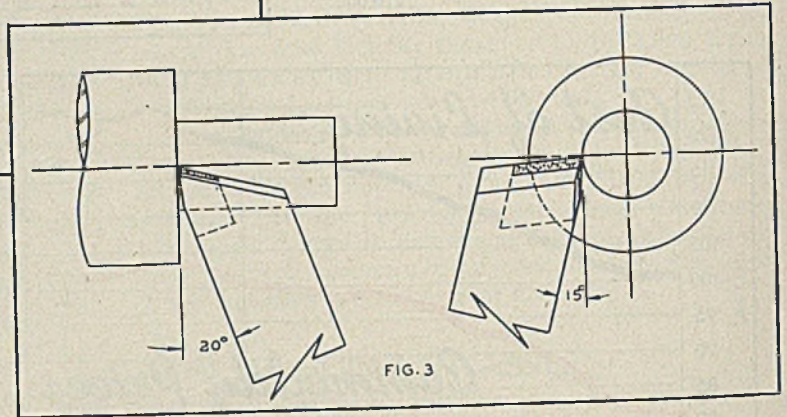


FIG. 3

Fig. 1—Design details of the "standard" design Carboly roller turner tool for Warner & Swasey turret lathes for turning to a 90-degree shoulder

Fig. 2—Details of "standard" Carboly roller turner tool for Warner & Swasey turret lathes when making heavy cuts

Fig. 3—Setup of a properly ground "standard" Carboly roller turner tool in a Warner & Swasey holder

AS RAPIDLY as the use of carbide tools has become accepted for any specific type of application, such tools have been either "standardized" for mass production or have become "design standards" in the carbide tool industry.

Among the newer design standards are the "roller turner" tools intended for use with Warner & Swasey as well as Gisholt lathes. The demand for such tools has become unusually pronounced during the past year as the result of the many bar-stock turning operations required to make war products.

The basic principles of application of carbide tipped roller turner tools do not differ fundamentally from accepted carbide tool application practice. The following factors must be taken into consideration however if such tools are to be used to their maximum efficiency.

SETTING OF TOOL AND ROLL: Carbide roller turner tools should be set on a radial centerline of the work or slightly above (never set it below centerline). Tools set too far above the center will have insufficient front clearance resulting in excessive tool wear. Tools set too far below center will have excessive front clearance and insufficient support under the nose.

Unless a diameter must be turned accurately concentric with a previously finished diameter, the rolls should be set to follow the tool. The advantage of this practice is that the rolls will then help to produce a good finish on the work.

To assure that the rolls will ride on a

finished and smooth cylindrical surface and engage as soon as possible after the tool starts to cut, they should be set from 1/64 to 1/32-inch behind the high point of the nose radius of the tool.

To determine whether pressure of the rolls against the work is correct, place the thumb against the rolls with the work revolving and the feed disengaged so

feed may be decreased to 0.008 to 0.012-inch. Feeds less than these values will subject the tool to more wear due to the increased rubbing action.

TOOL SHAPE: Although only the design of Carboly roller turner tools for both Warner & Swasey and Gisholt type lathes has now been standardized, the same design principles apply to tools for other machines. The major differences will be in tool shape details controlled by the sizes of and the angles incorporated in the tool slot of the roller turner used.

For illustrative purposes the "standard" design roller turner tools for Warner & Swasey lathes will be dealt with in detail.

Fig. 1 illustrates the standard tool design for turning to a 90-degree shoulder. The cutting edge forms a 3-degree angle with the shank. This angle is necessary since the tool shank is held at a compound angle in relation to the work.

Fig. 2 similarly illustrates an 8-degree angle at the cutting edge to produce a 5-degree lead angle with relation to the work. This angle is desirable for heavy cuts when a 90-degree shoulder is not required.

The other tool angles shown are such as to produce the recommended back rake and front and side reliefs when the tool is set on center or slightly above. With tools held in this manner, the effective back rake will be approximately 5 degrees and both front and side relief

By R. D. MACK
Carboly Co. Inc.
Detroit

that the tool is not engaged in the cut. A light thumb pressure should stop the rolls from turning when the roll pressure is properly adjusted. With insufficient or uneven pressure the work is apt to be forced out of line by the pressure of the cut.

SPEEDS AND FEEDS FOR STEEL:

The usual practice in lathe work with Carboly tools for cutting speeds and feeds is applicable to roller turning. In general, the cutting speed for steel should be over 200 feet per minute, the feed 0.015 to 0.030-inch per revolution. The speed should be kept sufficiently high to produce a shiny finish on the work. Too slow a speed will leave a ragged surface and the tool life will be shortened also.

To obtain a fine finish on the work the

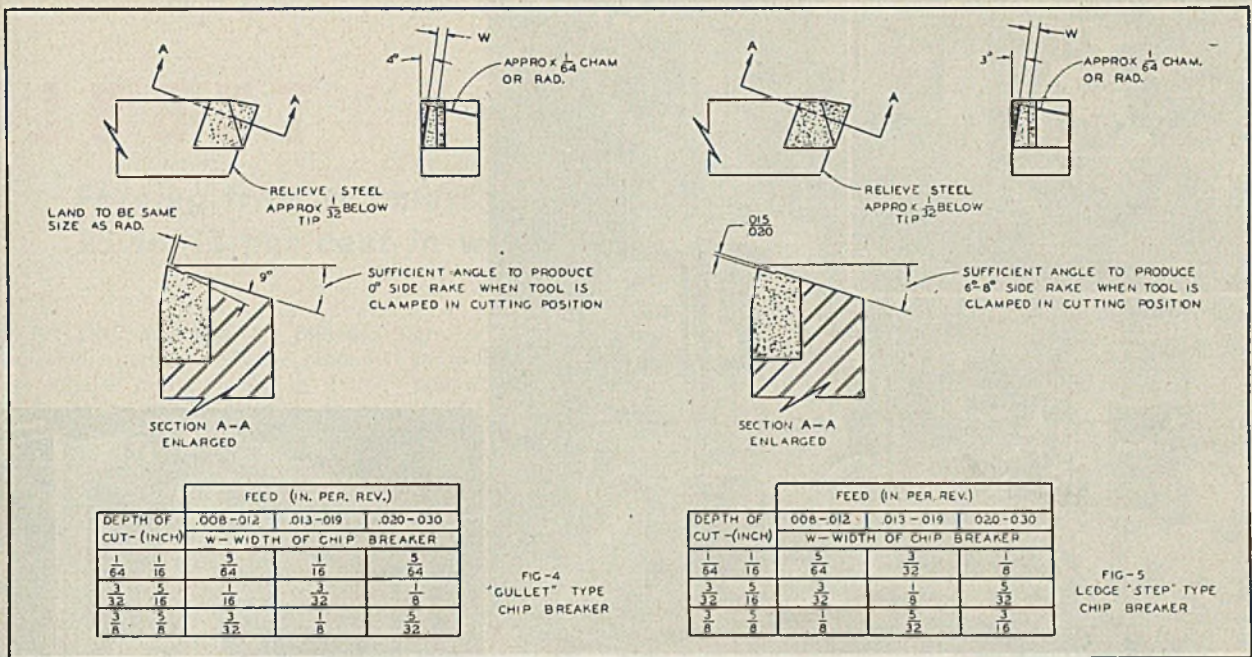


Fig. 4—Details of the gullet type chip breaker as used on Carbonyl roller turner tools

Fig. 5—Details of the ledge or "step" type chip breaker for Carbonyl roller turner tools

will be approximately 7 degrees. An advantage of the 5-degree back rake is that it helps to permit free chip flow away from the tool and thereby reduces the possibility of the chips interfering with the rolls. This point is especially significant when turning small diameter work where the space between the tool and the rolls is limited.

Fig. 3 shows the tool setting that obtains due to the compound angle of the tool holder.

The nose radius should be approximately 1/64-inch for maximum tool life.

CHIP BREAKERS: Roller turner tools today are used almost exclusively for cutting steel. For this operation they must have a chip breaker to coil the chip and direct it away from the tool and rolls.

Ground-in chip breakers similar to those used in some high-speed steel roller turner tools are practical for Carbonyl roller turner tools. The side rake angle is easily incorporated in the chip breaker surface of these tools.

Two common styles of chip breakers are illustrated in Figs. 4 and 5. An advantage of the gullet type shown in Fig. 4 is that it is very effective in directing the chip away from the work. Also advantageous is the fact that any nicks in the cutting edge developed during the grinding of the faces will be removed by the grinding of the land. The ledge or "step" type chip breaker, Fig. 5, has the advantage of being simple to grind.

Dimensions shown in Figs. 4 and 5 for various cuts and feeds are intended to be guides only. Minor deviations will be necessary to suit the requirements of steels of various grades and hardnesses.

The sharp edge at the shoulder of the chip breaker should always be removed with a hand hone. A sharp edge would scrape fine shavings from the chip. These shavings tend to spoil the finish of the work when they are carried between the work and the rolls.

- GRINDING SEQUENCE:** The sequence of grinding operations for tools having chip breakers as in Fig. 4 should be:
- Relieve steel from the vicinity of the surfaces to be finished.
 - Grind front and side relief or clearance surfaces.
 - Grind chip breaker.
 - Grind land and top face.
 - Grind nose radius.
 - Hone front edge of tool and shoulder of chip breaker to remove sharp edges.
- The sequence of grinding operations for tools having chip breakers as in Fig. 5 should be:
- Relieve steel from vicinity of surfaces to be finished.
 - Grind top faces.
 - Grind chip breaker.
 - Grind front and side relief or clearance surfaces.
 - Grind nose radius.
 - Hone front edge of tool and shoulder of chip breaker to remove sharp edge.

To obtain the proper angles in all machine grinding operations, the tool should be held in a universal vise or in a special fixture which automatically presents the tool to the grinding wheel at the angles required for the individual roller turner used.

The front and side relief or clearance surfaces should be ground on a 100-grit silicon carbide or diamond wheel of the cup type. This can be done by hand or machine. Where a large amount of carbide must be removed, time may be saved by hand grinding on a 60-grit silicon carbide wheel. For relieving the steel, an aluminum oxide wheel on a pedestal grinder should be employed.

The chip breaker should be ground on a small tool and cutter grinder or a chip breaker grinder, using a 100-grit straight diamond wheel. The wheel should be fed vertically into the tool at a feed not greater than 0.0005-inch per pass.

The top face can be ground by using the same machine and 100-grit diamond wheel. An advantage of this practice is that it will help prevent the wheel from developing a crown which would make it difficult to obtain a good chip breaker.

To produce a smooth land and a keen edge in grinding the top face of Fig. 4 type tools, the wheel should be set at right angles to the cutting edge and the direction of rotation be against this edge. For tools not having a land, as in Fig. 5, the wheel orientation and direction of rotation is optional since the cutting edge lies below the top face.

The nose radius should be ground by hand. A good even curve can be formed by grinding several small flats approximately tangent to the radius and then using a hand hone to round off the high points.

A new type low-loss vitreous resistor coating, called Lectraseel, is announced by Pemco Corp., Baltimore. It is reported to be highly resistant to thermal shock and its co-efficient of expansion and contraction, will, 99 times out of a 100 parallel that of ceramic cores.

Accelerated weathering tests indicate that a coil treated with the coating is immune to corrosion and should give satisfactory low loss service over a long period even under the most adverse conditions.

TUBULAR

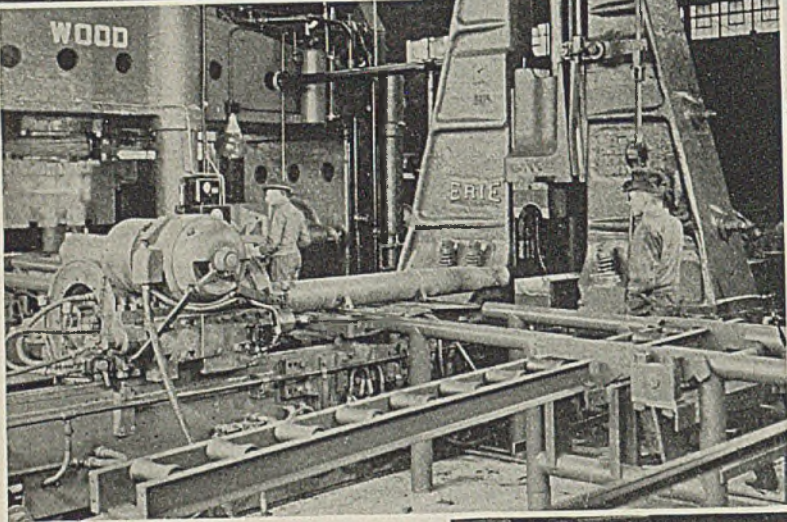
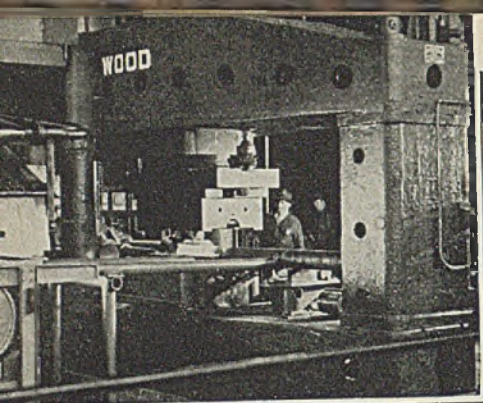


Fig. 1 (Top left)—Tubes come from continuous furnace at left with one end heated for upsetting in the specially designed press at right which increases wall thickness of tubes

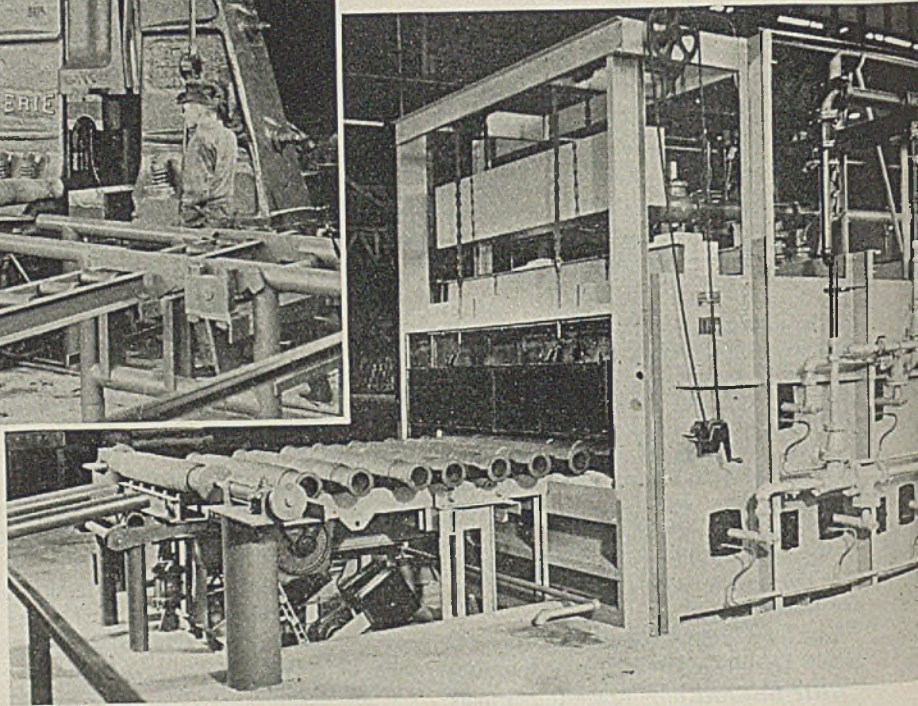


Fig. 2 (Above)—After upsetting, tube moves to forging hammer where journal and wheel seat are forged

Fig. 3 (Right above)—Following hammer operations, axles go through this continuous hardening furnace. Exit end here shows air cylinders on lift and setup for inserting plugs into tube ends so only exterior surfaces of tubes are quenched

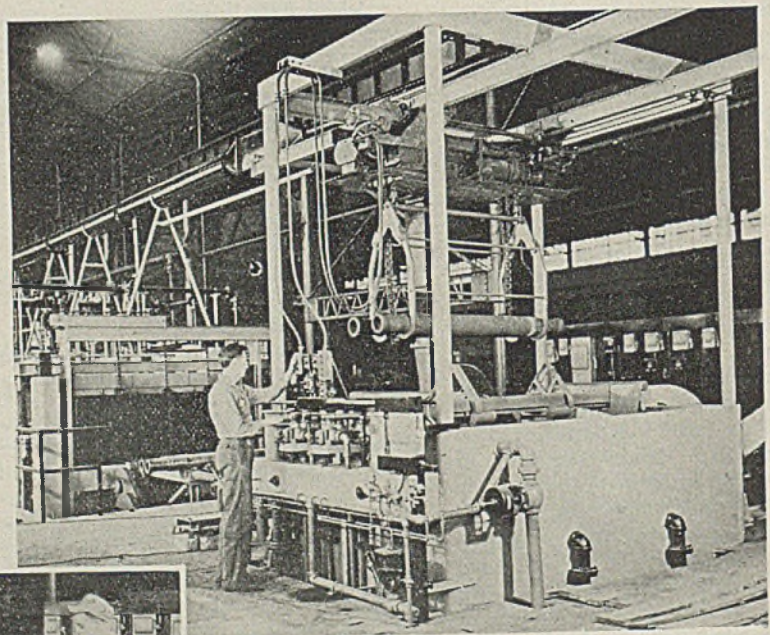


Fig. 4 (Right)—Specially designed machine shown here straightens and quenches axles

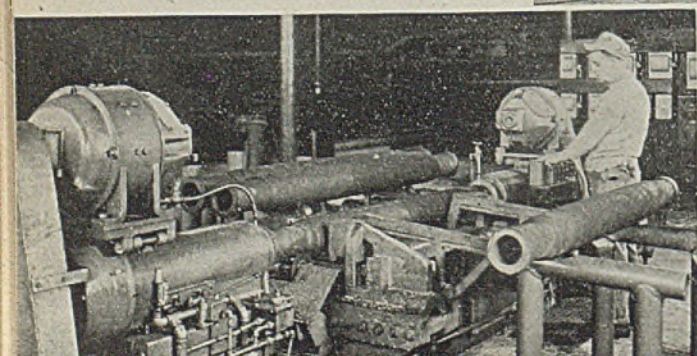


Fig. 5 (Left)—Axles are machined to exact centers in the final operation

RAILWAY AXLES

Forging from seamless tubing saves 25 to 43 per cent in weight

OPERATING economies for railroads are expected to result from the production of tubular railway axles by Pittsburgh Steel Co. at an addition to its plant at Allenport, Pa. The plant, placed in production last week, is designed for a production of 500 axles a day with provision being made for increasing capacity in the future by the installation of additional equipment.

The axles are completely interchangeable with solid axles of the conventional type so that no changes in journal boxes or trucks will be necessary for their use as standard railroad equipment. They are shipped to users with the centers machined so that they can be turned to standard journal and wheel seat dimensions on the types of lathes now in general use by railroads with only the addition of suitable fittings for handling the tubular product.

The raw material consists of seamless tubing produced by the company's adjoining Pilger mill. The principal difference in the external dimensions of the tubular axles and the solid axles is between the wheel seats. Between the wheels, the tubular axles are straight and are left with the natural finish produced by the Pilger mill operation. They do not have the fillets and subsequent taper toward the center which is typical of solid axles.

The accompanying diagram, Fig. A, compares halves of the tubular and solid axles. It also shows the relative external shapes as well as the inside contours of the tubular product.

Substantial savings in weight result from the use of the new product as well as greater resistance in distortion and

greater fatigue resistance. The saving in weight per axle varies from 177 pounds on axles with 5 x 9-inch journals to 510 pounds on axles with 6½ x 12-inch journals. These savings in weight range from 25.1 to 42.8 per cent. With four axles per car, the weight reduction would range from 708 pounds to 2040 pounds per car.

Based on a daily production of 500 medium size axles with 5½ x 10-inch journals on each of which there is a weight saving of 260 pounds, this would amount to 65 tons of steel a day. While this reduction in the use of a critical material has its immediate importance to the war effort, it will result in long range economies in railroad operation, especially after a large portion of railroad rolling stock is equipped with tubular axles.

Railroad operating officials report varying estimates of the cost of hauling the nonpaying weight of freight cars. On the basis of an average operation of 10,000 miles per year for each car, these estimates range from \$12 to \$18 per ton per car per year. Assuming an average cost of \$15 per ton per car per year for hauling nonpaying weight, the savings from the lighter tubular axles would range from \$7.53 for 40-ton cars with 5 x 9-inch journals to \$15.30 per car per year for 70-ton cars with 6½ x 12-inch journals.

The reduction in unsprung weight also materially reduces rail hammer and may be expected to result in a substantial ultimate saving in maintenance-of-way expenses when a sufficient number of cars become equipped with tubular axles.

The process for the production of

tubular axles was developed and tests were completed three years ago by Pittsburgh Steel Co. and Urschel Engineering Co. The difficulties of securing equipment and building a suitable plant for launching a new product under war conditions delayed completion of the plant although axles made on an experimental basis have been in railroad service.

The Pilger process, by which the tubes are produced for the axle plant, is a unique tube manufacturing method. After cylindrical billets are pierced, the rolling process differs fundamentally from the usual method of completing the tubes.

The rolls used to form the tubes are elliptical and they rotate in a direction opposite to the feed of the steel which is pressed against the rolls by a ram. The steel is fed forward by the ram when the pass between the rolls is wide. As the pass narrows, the rolls produce an effect similar to the blows of a forging hammer. The inside diameter of the tubes is maintained by the use of a mandrel. The resulting product has the superior qualities which naturally result from a forging operation in comparison to a rolling operation.

Upsetting Press a Feature

After being cut to suitable sizes, the tubes are taken to the axle plant and are passed through a continuous furnace which heats one end of each tube. The heated ends are then upset in a tube upsetting press. This press, the heart of the operation, was built by R. D. Wood Co., Philadelphia. In it, the heated end is held in a die to maintain the outside diameter constant, while the inside diameter is brought to the proper size. The ends are shaped to form the journals and wheel seats of the axle by a 3000-pound drop hammer.

Following this operation, the tubes are returned to the heating furnace by a conveyor and the opposite ends are heated, upset and forged. In normal operation, each alternate tube is new material, while the adjoining pieces are going through the process for the second end.

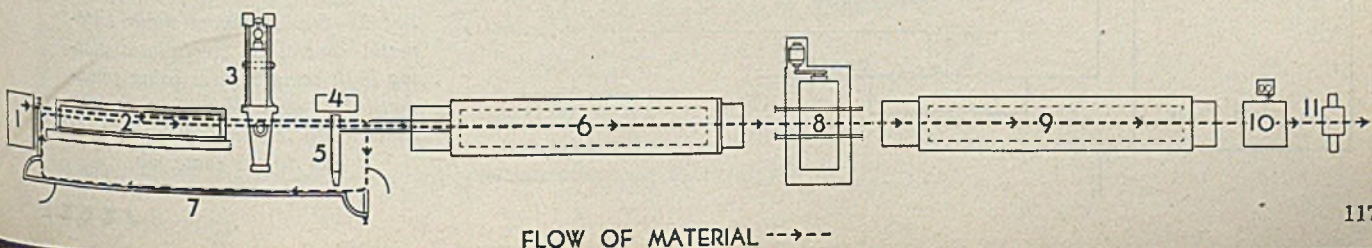
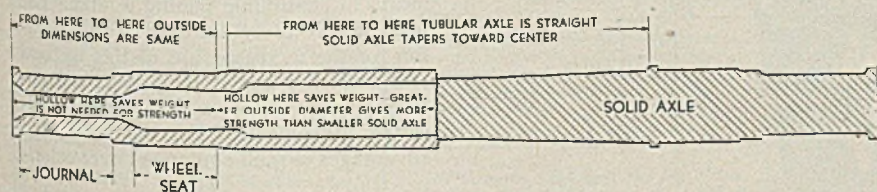
The axles which have been finished at both ends then pass to a continuous hardening furnace. After emerging from this, they are straightened and quenched in a machine so designed that the ends of the axles are plugged and quenching takes place only on the outside.

Following quenching, the axles are passed through a forced convection draw furnace and then go through a cooling

(Please turn to Page 162)

Fig. A (Below)—Comparison of solid and tubular axles

Fig. B (Bottom)—Tubular axle plant: 1, elevator and loading table; 2, continuous tube and heating furnace; 3, 600/900-ton upsetting press; 4, 3000-pound drop hammer; 5, oscillator; 6, continuous hardening furnace; 7, conveyor to return tubes for processing opposite end; 8, quenching machine; 9, forced convection draw furnace; 10, cooling tank; 11, centering machine



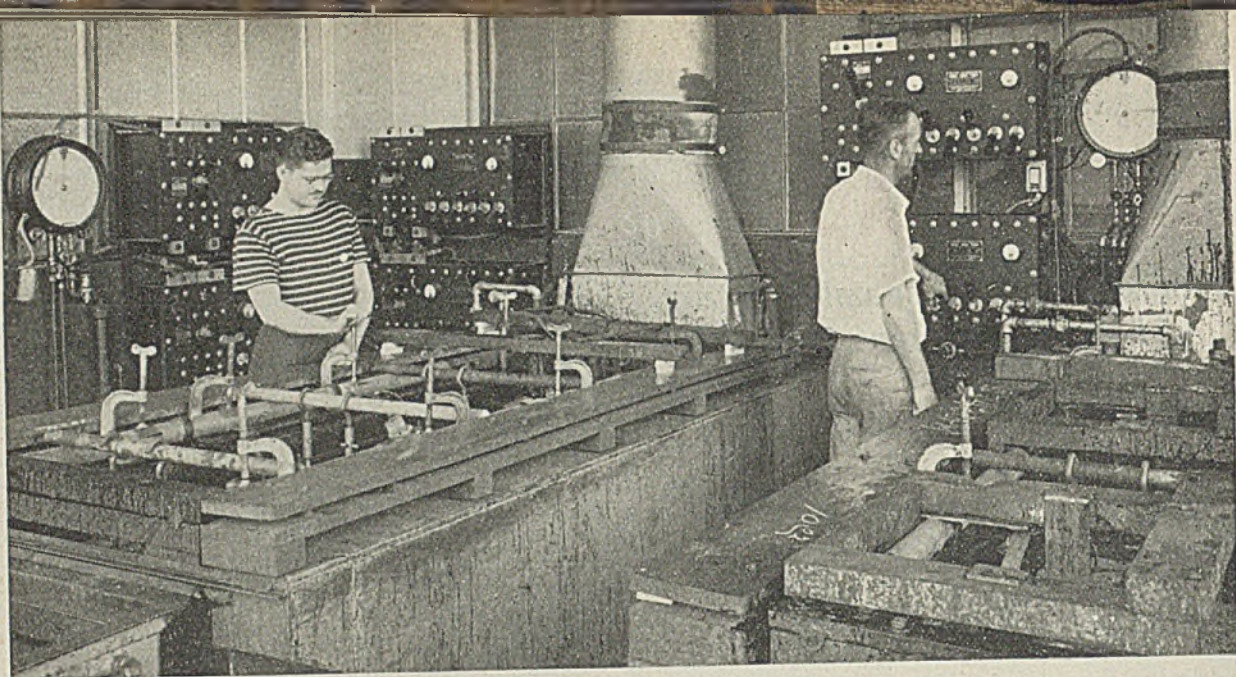


Fig. 1—Shown here are tanks for hard chromium plating in the Paterson, N. J., plant of the Wright Aeronautical Corp. Both heating and cooling of the plating baths are automatically controlled with duplex temperature recording controllers

Select right instruments in setting up automatically CONTROLLED PLATING PROCESSES

AUTOMATIC control of electroplating bath temperatures now is generally accepted but the selection of the right instruments for specific plating operations is most important and, therefore, a discussion of current practice may be helpful to technical men doing this type of work.

In general, an instrument engineer likes to find out what the product specifications are and then control the process variables from this. Examples are the automatic control of a paper machine dryer from a measurement of moisture content in the finished paper, and the automatic control of a multiple effect evaporator from a measurement of density of the product.

In the case of plating, the "product" specifications fall into two general groups.

By D. M. NIELSEN
Control Engineer
Foxboro Co.
Foxboro, Mass.

The first group of specifications is concerned with corrosion resistance or wear resistance properties, such as thickness and porosity. The second group of specifications is concerned with the appearance factors such as color, luster, etc.

For an instrument engineer, the ideal method of automatic control would be to measure these factors continuously with the work in the bath and to remove the work as soon as it meets specifications. The factors controlled would be solution strength, current density and bath temperature, as these have been shown repeatedly to be the main variables affect-

ing the quality of the work.

As a practical matter, this ideal probably will never be reached. First, there are no instruments for continuous measurements of thickness and porosity while work is being plated, and there is little pressure to develop any instruments and measuring techniques for color, luster and the like. Therefore, there is little reason to expect any considerable change from the present technique of establishing suitable solution strength, current density and bath temperatures by trial and using the measurements of plate thickness and porosity of finished work as controls.

Current Density: Automatic control of current density is an instrument engineer's dream until someone invents an instrument for the measurement of surface area of plating work. Practically, nothing more than the usual tank rheostat will be necessary on most processes, as satisfactory operation can be obtained over a wide range of current densities.

Solution Strength: Within recent years, the value of pH measurements as a means of controlling plating solutions has been widely recognized. The main reason for the increased use of this method of control has undoubtedly been the development of simple and sturdy pH indicating instruments. For plant use, the advantages of such equipment over colori-

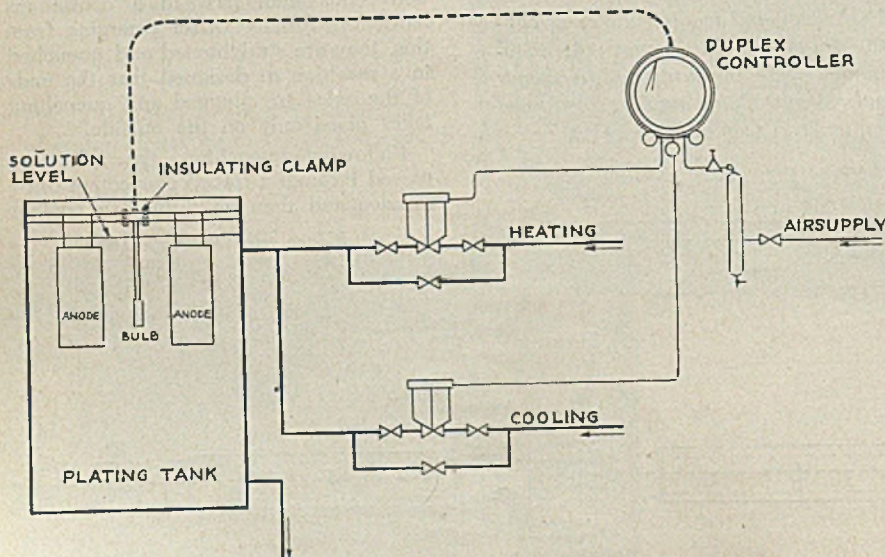


Fig. 2—Typical layout shows automatic control of electrolytic plating bath temperatures using pneumatically controlled instruments. Electrically controlled equipment will do the same job



RIGHT FROM THE PAGES OF THIS TOOL STEEL MANUAL

You can find ways to . . .
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IDLE machines and presses—waiting for tools that must be repaired, reground or replaced—can be kept working more hours per month. And the Carpenter *Matched Tool Steel Manual* can help you keep them on the job to increase output where it is needed.

In thousands of plants, this Manual is helping to eliminate costly machine shut-downs. And its simplified heat treating instructions protect the many valuable hours that go into the making of tools.

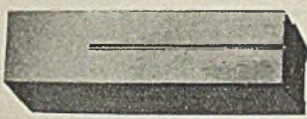

The Carpenter *Matched Set Method* of selecting

tool steel is not "just a fancy name". Ask any Tool Room Foreman who has used it . . . and note the *typical* results shown here.

It's easy to cash in on the advantages of the *Matched Set Method*. Just drop us a note on your company letterhead and we'll start your copy of the Carpenter *Matched Tool Steel Manual* on its way. And, of course, when you need personal help with a special tool steel problem, your nearby Carpenter representative will be glad to put his diversified experience to work for you.



These Two Plants Used the Matched Set Method . . . and look at the Results they Got!

<p>1</p> 	<p>2</p> 
<p><i>The Tool:</i> A striking die for stamping gold-filled spectacle temples.</p> <p><i>The Problem:</i> When made from a straight carbon tool steel, the die would break after about 14,000 pieces.</p>	<p><i>The Tool:</i> A draw die for drawing bearing retainers from plain hot rolled steel $\frac{1}{8}$" thick.</p> <p><i>The Problem:</i> After about 4,000 pieces, the die had to be replaced because of oversize wear. Replacing the worn die consumed 1 hour, during which the press was idle.</p>
<p><i>The Solution:</i> The Tool Engineer saw that <i>greater toughness</i> was needed, so he checked the <i>Matched Set Diagram</i> and found that <i>Solar</i> would probably give best results.</p> <p>With <i>Solar</i>, output per tool jumped from 14,000 to 100,000 pieces!</p>	<p><i>The Solution:</i> Going to the top of the <i>Matched Set Diagram</i> for <i>greater wear resistance</i>, they selected <i>K-W</i> tool steel and got these results:</p> <ol style="list-style-type: none"> 1. Tool life increased from 4,000 to 86,000 pieces. 2. Press shut-down time was reduced by 42 hours a month, which meant 52,500 pieces extra output per month.

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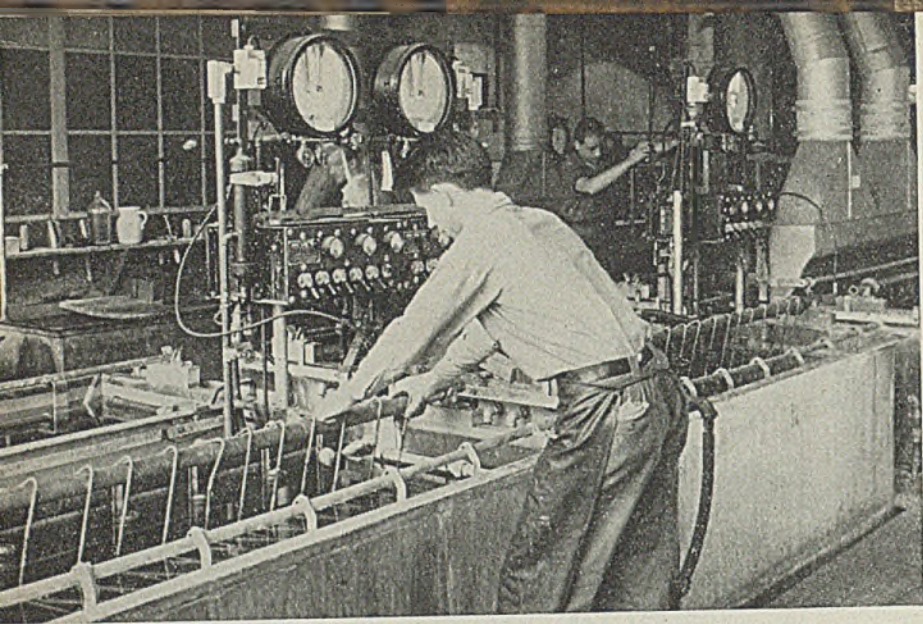


Fig. 3—Single-action temperature recording controllers are employed in controlling bath temperatures in applying tin electrically in Wright Aeronautical Corp.'s plant at Paterson, N. J.

metric methods with indicators is obvious.

Here again it seems very unlikely that continuous measurement of solution pH, and the automatic and continuous addition of chemicals by means of suitable controlling instruments will be necessary. In general, the pH of plating solutions varies slowly so that periodic checks with portable indicating instruments provide entirely adequate control.

Bath Temperature: In contrast with the two variables just mentioned, automatic control of bath temperatures has been common practice for some years.

The general use of automatic temperature control has come with the development of high efficiency baths operated at high current densities and (or) high temperatures to get low bath resistance. With artificial cooling or heating, or both, needed for these baths, the possibilities of the temperature varying rapidly and frequently outside the suitable operating zone are obviously much greater than with a bath operated at room temperatures and with low current densities. And the results of such temperature variations are certainly too well known to require any detailed listing here—discoloration and lack of luster, bath solution decomposition, cracks and porosity, etc.

Is Automatic Control Needed?

The one main criterion of whether automatic temperature control is needed is whether artificial cooling or heating, or both, are needed. If so, automatic temperature control will pay for itself quickly in savings of steam, cooling water and operator's time on every bath in steady use. In small baths a direct-operated thermostat may be all that is economically justified, while high-speed baths use specialized control instruments.

Instrument Selection: The following factors are important in the selection of suitable instruments:

First is the choice of whether the instrument is to control only heating or cooling, or both heating and cooling. If heating and cooling are needed, full automatic control of both is desirable. Generally, if the bath must be heated at morning start-up, after which the bath is cooled normally, it is not satisfactory to

place heating or cooling on manual control when the other medium is under automatic control. If operators forget to close the hand valve, the automatic control instrument is unable to control, and much steam and cooling water is wasted.

Duplex temperature recording controllers such as installed in the plant of the Wright Aeronautical Corp., Paterson, N. J., and shown in Fig. 1, are suitable under these conditions. Diagram of such an installation is indicated in Fig. 2. If control of heating only is required, a single-action unit is sufficient. This type of installation, also in the Wright plant, is shown in Fig. 3.

As a broad indication of plating practice, the following list shows types of control commonly used.

Chromium—control both heating and cooling

Nickel—control heating

Copper—control heating

Brass—control both heating and cooling

Cadmium—control heating and cooling.

The second main consideration in specifying a controller is the choice of the correct type of control mechanism; that is, whether on-off, proportional, or proportional plus reset control action.

With on-off controllers the control valve is either fully open or fully closed and "snaps" from one position to the other as bath temperature passes the control setting point. With proportional controllers the valve is partly open when bath temperature is at the control setting point, and (on heating applications) the valve opens gradually as the temperature falls below and closes gradually as temperature rises above the control setting point. Proportional plus reset controllers have action similar to proportional type plus an automatic resetting of valve position to hold temperature at control point regardless of process changes.

The choice between these types of mechanisms is determined primarily by the characteristics of the plating bath for the application of automatic control. This latter factor is determined by the shape of the tank and amount of liquid in the bath, the amount of circulation or agitation of the bath, method of heating and cooling (that is, pipe coils, circula-

tion of the solution through an external heat exchanger), or similar factors.

For still plating baths with temperature control through pipe coils or electric resistance heating elements, practically universal practice is to use on-off controllers. This covers the great majority of plating baths.

On some small plating baths, temperature is controlled by means of a water jacket through which temperature controlled water is circulated from a separate reservoir. If the water reservoir has a large capacity and its temperature is controlled by direct injection of steam or cold water, an on-off controller may be satisfactory. If the capacity of the reservoir is small and indirect heating through coils is used, a proportional controller may be needed. The experience of an instrument engineer is usually desirable for selecting the correct control instrument for this type of bath.

On plating baths, where the solution is circulated through external heat exchangers, a proportional controller is necessary. With proper adjustment of this type of instrument, control will be stable. However with varying heat loads, the control temperature may drift several degrees. If such small drifts are not acceptable, an automatic reset mechanism should be specified in addition to the proportional control features.

Electric Or Pneumatic Equipment?

The third main point in specifying temperature control instruments is the choice between electrically and pneumatically operated equipment. Equivalent on-off controllers are available in both pneumatic and electric types. However, only a limited selection of electric proportional controllers is available. Pneumatically operated equipment is generally used.

Where either electric or pneumatic equipment can be used, the choice between them will depend very largely on experience and preference and on local installation conditions. If it would be necessary to install an air compressor for a single instrument or if it would be inconvenient to use existing air supply lines, then the electrically operated equipment would be preferable.

Instrument Installation: During the past several years, many plating temperature controllers have been installed and operated by men with no previous instrument experience. Many mistakes have been made, and the following installation tips have been culled from field reports:

—Mount the controller at the end of the plating tank or next to an alley. The instrument should be accessible so that the operator can change charts and ink

(Please turn to Page 160)



**THE TEST
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The Levinson Steel Co. is today serving 99.1% of the now active customers who dealt with them in 1933 ... 98.6% of those now active who were on their books in 1923. Added to these are hundreds upon hundreds of new satisfied customers. *That's a simple story of growth and progress.*

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Accomplishments in . . .

NE STEEL SPECIFICATIONS

SINCE ITS inception in Sept., 1941, the WPB National Emergency Steel Specifications project has been actively engaged in selecting the minimum number of specifications, compositions and sections of steel mill products necessary for the war emergency, in order to increase production with existing facilities.

This project was originally established by Donald M. Nelson, in his then capacity of Director, Division of Purchases, OPM, as an aid to the Iron and Steel Section of that agency, which later became the Steel Division, WPB. Three national agencies—the American Iron and Steel Institute, Society of Automotive Engineers, and the American Society for Testing Materials were asked to direct this work in collaboration with the War and Navy Departments. C. L. Warwick was named administrator of the project and chairman of the Administrative Committee, which is composed of representatives of the five organizations named above. Edwin Joyce was appointed assistant administrator.

Guided by Technical Groups

The organization has remained intact since its inception and has operated as a unit of the Conservation Division, maintaining close contact with members of the Steel Division.

The Administrative Committee is assisted in the highly technical phases of its work by twelve Technical Advisory Committees, appointed by the administrator and in all composed of 136 representatives of producing interests, 211 representatives of consuming interests, and 31 representatives of various federal agencies. Representatives of Great Britain and Canada meet with the Technical Advisory Committees and the Administrative Committee as liaison consultants. These Technical Advisory Committees serve as the meeting ground for representatives of all important producers and all agencies having cognizance over specifications for steel mill products.

The recommendations of the Technical Advisory Committees cover the selection of permissible specifications, modification of existing specifications or preparation of new specifications, simplification of sizes and sections, and conservation of critical ferroalloys. These recommendations are made effective either by the voluntary and co-operative support of producers and consumers, or by the issuance of WPB orders.

The NESS accomplishments in a very large measure have been achieved by co-operative action on the part of spon-

sor agencies in modifying existing specifications at the request of the Technical Advisory Committees. By these modifications the specifications have been made less restrictive or the requirements have been co-ordinated with those of similar specifications. Of the 250 odd specifications selected by the various TACs, exclusive of aircraft steel specifications, approximately one-half have been thus modified either by revision or by the issuance of emergency amendments. These same sponsor agencies have similarly issued 12 new specifications covering products previously on private consumer specifications only. A list of the new and amended specifications issued on the recommendations of the TACs is shown here.

A striking example of co-operative effort by industry to assist in the NESS work concerns aircraft steel compositions, which were reviewed in Jan., 1942, by the TAC on Aeronautical Steels and drastically reduced in number to a preferred list which the industry was then asked to follow. This list was supplemented by a selection of certain alternate compositions designed to conserve

nickel, chromium and molybdenum, which the industry was asked to test and use in place of the higher alloy conventional aircraft steels. Adherence to these preferred compositions by the aircraft industry has made the issuance of a mandatory order unnecessary. The use of these alternate NE steels has increased month by month as laboratory and type tests were completed until at the present time this conversion represents 15 to 20 per cent of the total tonnage produced for aircraft uses.

Mandatory orders pertaining to the NESS work have been issued as schedules to Limitation Order L-211. There are now 13 such schedules as follows:

Schedules:

- 1—Concrete Reinforcement Steel.
- 2—Steel Wheels and Tires.
- 4—Structural Steel Shapes.
- 5—Steel Axles and Forgings (Railroad and Transit Service).
- 6—Mechanical Steel Tubing.
- 7—Rails and Track Accessories.
- 8—Carbon Steel Plates.
- 9—Oil Country Tubular Goods.
- 10—Water Well Tubular Products.
- 11—Steel Pressure Pipe.

TABLE I—EMERGENCY PROVISIONS TO STANDARD SPECIFICATIONS

SPECIFICATION DESIGNATION	PRODUCT
Association of American Railroads	
Manual of Standard and Recommended Practice	
AAR-E-M-101-42	Carbon steel axles for locomotives and cars
AAR-E-M-102-42	Carbon steel forgings for railroads
AAR-E-M-103-42	One wear wheels
AAR-E-M-104-42	Railroad forgings
AAR-E-M-106-42	Locomotive and car tires
AAR-E-M-107-42	Multiple wear wheels
AAR-E-M-111-43	Welded and seamless steel pipe
AAR-E-M-116-42	Structural shapes, plates and bars
AAR-E-M-123-42	Heat treated multiple wear wheels
AAR-E-M-124-42	Heat treated steel tires
American Society of Mechanical Engineers	
Boiler Construction Code Material Specifications	
ASME-S-4	Seamless drums and other special forgings for pressure vessels
ASME-S-11	Carbon-steel castings
ASME-S-17	Lap-welded and seamless boiler tubes
ASME-S-32	Electric resistance welded boiler tubes
ASME-S-33	Alloy-steel castings for pressure vessels and pressure piping for high temperature service
ASME-S-35	Forged or rolled pipe flanges, fittings, valves and parts
ASME-S-40	Seamless boiler tubes
ASME-S-48	Carbon-molybdenum boiler and superheater tubes
ASME-S-52	Seamless alloy-steel boiler and superheater tubes
ASME-S-56	Carbon-steel castings for fusion welding
ASME-S-57	Alloy-steel castings for fusion welding for high temperature service
ASME-S-65	Electric-resistance-welded carbon molybdenum boiler and superheater tubes
ASME-SA-95	Carbon-steel castings for high temperature service
American Railway Engineering Association	
Specifications	
AREA-1942	Open-hearth steel rails
AREA-1939	Heat-treated carbon-steel track bolts
AREA-1934	Soft steel cut track spikes
AREA-1942	High carbon steel track spikes
AREA-1942	Soft and medium steel tie plates
AREA-1942	Hot worked, high carbon steel tie plates

"That Yankee gun they load on Sunday for the rest of the Week!"



These cynical and war-weary words were a Confederate soldier's description of a famous weapon of the Civil War. It was the Henry Rifle — a Yankee answer to a national emergency, back in the days of muzzle-loaders.

Benjamin Tyler Henry, the gun's inventor, was considered one of the greatest gunsmiths of the 19th century, and he helped to found the fame of Jones & Lamson in the early days of American industry . . . while the gun, in turn, commenced the fame of a great American company as the first of the world-famous line of Winchester Repeating Rifles.

* * *

It was on a Sunday that America looked up from the tragedy of Pearl Harbor and asked her industries for a Yankee gun — Today, Jones & Lamson machine tools and engineering are again helping to produce many Yankee guns such as this world has never seen before.

And after the war is over, our engineers and service men will play an equally important part in helping industry to convert to peacetime production . . . when new companies and products will once more stem from the men and the machines of America's oldest machine tool company. Call upon Jones & Lamson, now!



Universal Turret Lathes . Fay Automatic Lathes . Automatic Thread Grinders . Optical Comparators . Automatic Opening Threading Dies



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MACHINE CO., SPRINGFIELD, VERMONT, U.S.A.
Profit-producing Machine Tools

**SPECIFICATION
DESIGNATION**

PRODUCT

**American Society for Testing Materials
Specifications**

ASTM-A1 -39	Open-hearth steel rails
ASTM-A21 -36	Carbon steel axles for cars
ASTM-A25 -41	Wrought steel wheels, electric service
ASTM-A26 -39	Steel tires for export service
ASTM-A27 -42	Carbon-steel castings
ASTM-A53 -42	Water well pipe
ASTM-A57 -39	Multiple wear wheels
ASTM-A67 -33	Steel tie plates
ASTM-A83 -42	Lap-welded and seamless boiler tubes
ASTM-A87 -42	Carbon and alloy-steel castings
ASTM-A95 -41	Carbon-steel castings for high temperature service
ASTM-A120-42	Welded and seamless steel pipe
ASTM-A134-42	Electric-fusion welded steel pipe
ASTM-A135-42	Electric-resistance-welded steel pipe
ASTM-A139-42	Electric fusion welded steel pipe
ASTM-A157-42	Alloy-steel castings for pressure vessels and pressure piping for high temperature service
ASTM-A158-42T	Alloy steel pressure pipe
ASTM-A160-39	Reinforcing steel
ASTM-A161-40	Seamless carbon-molybdenum still tubes
ASTM-A178-40	Electric-resistance welded boiler tubes
ASTM-A179-42	Seamless cold drawn heat exchanger and condenser tubes
ASTM-A182-40	Forged or rolled pipe flanges, fittings, valves and parts
ASTM-A183-40T	Heat-treated carbon steel track bolts
ASTM-A192-40	Seamless boiler tubes
ASTM-A199-40	Alloy steel heat exchanger and condenser tubes
ASTM-A200-40	Alloy steel still tubes
ASTM-A206-42T	Carbon-molybdenum pressure pipe
ASTM-A209-41T	Carbon-molybdenum boiler and superheater tubes
ASTM-A211-40	Spiral-welded steel or iron pipe
ASTM-A213-42	Seamless alloy-steel boiler and superheater tubes
ASTM-A214-42	Electric resistance welded heat exchanger and condenser tubes
ASTM-A215-41	Carbon-steel castings for fusion welding
ASTM-A216-42T	Carbon-steel castings for fusion welding
ASTM-A217-42T	Alloy-steel castings for fusion welding for high temperature service
ASTM-A226-40	Electric resistance welded boiler and superheater tubes
ASTM-A234-42	Forged welding fittings
ASTM-A235-42	Forgings for general industrial use
ASTM-A236-42	Carbon steel forgings for locomotives and cars
ASTM-A237-42	Alloy-steel forgings for general industrial use

**SPECIFICATION
DESIGNATION**

PRODUCT

ASTM-A238-42	Alloy steel forgings for locomotives and cars
ASTM-A241-41	Hot worked high carbon steel tie plates
ASTM-A248-41T	Carbon and alloy-steel blooms, billets and slabs for forgings
ASTM-A250-41T	Electric resistance welded carbon molybdenum boiler and superheater tubes

**American Petroleum Institute
Specifications**

API Standard No. 5-A	Oil country tubular goods
API Standard No. 5-L	Line pipe

**American Water Works Association
Specifications**

AWWA-7A.4-1941	Steel water pipe
AWWA-7A.3-1940-TR	Steel water pipe

**Underwriters Laboratories Inc.
Standard**

U. L. Sp. I-888-38-43	Steel pipe lines
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Federal Specifications

Federal QQ-B-71	Reinforcing steel
Federal QQ-S-741	Carbon steel plates structural
Federal VW-P-403	Steel pipe

U. S. Army Specifications

Army 57-114	Structural steel
Army 57-114	Carbon steel plates, ordnance materiel

Navy Department Specification

Navy 22Y	Structural steel
Navy 22Y	Carbon steel plates for welding
Navy 44T3	Seamless boiler tubes

U. S. Coast Guard Specifications

Coast Guard MIN-51.11	Carbon-molybdenum pressure pipe
Coast Guard MIN-51.10	Carbon-molybdenum boiler and superheater tubes

SPECIFICATIONS DEVELOPED ON RECOMMENDATION OF TACS

**SPECIFICATION
DESIGNATION**

PRODUCT

Coast Guard MIN-51.11a	Welded and seamless steel pipe
Coast Guard MIN-51.11b	Electric-resistance welded steel pipe
ASTM-ES-5a	Carbon-chromium ball and roller bearing steels
ASTM-ES-21	Forgings for magnetic retaining rings
ASTM-ES-22	Forgings for non-magnetic retaining rings
ASTM-ES-23	Forgings for rings for main reduction gears
ASTM-ES-24	Forgings for pinions for main reduction gears
ASTM-ES-25	Forgings for turbine generator rotors and shafts
ASTM-ES-26	Forgings for turbine rotors and shafts
ASTM-ES-27	Forgings for turbine bucket wheels
ASTM-Proposed	Carbon-steel blooms, billets and slabs for reforcing
ASTM-Proposed	Alloy-steel blooms, billets and slabs for reforcing

- 12—Steel Pressure Tubes.
- 13—Steel Pipe.
- 15—Hot Rolled Carbon Steel Bars.

Schedules 3 and 14 covering fencing and fence posts were developed outside of the NESS project. However both are simplification orders.

In order that the above schedules might be kept abreast of changes in processes of manufacture, in the steel and ferroalloy supply and in the rapidly varying pattern of use of steel, amendments, revision or interpretations to the schedules have been necessary. These have been issued only after very thorough consideration and study, and in consultation with the interests concerned. It has been necessary also to devote considerable attention to the appeals filed under these schedules, in order that users might not be deprived of essential products, and grants of appeals might not unnecessarily impede production of the steel mills, by setting aside schedule requirements.

"Customer" Specifications Eliminated

These schedules require the use of selected permissible specifications in the production and delivery of the products covered, and for most of these establish permissible sizes. Specifications set forth as permissible in these schedules are those of the Federal agencies, and those sponsored by National Technical organizations and in common use. This selection eliminates all so-called "customer" or private company specifications which impose "non-standard" requirements and therefore tend to slow up production.

On some products covered by schedules previous size standards were not in existence. Schedule 15 covering sizes of hot rolled carbon steel bars is of this class. For the first time designers and purchasers of carbon steel bars now have a list of standard bar sizes from which to make their selection. This list presents a reduction of 40 per cent in roll sizes, and the increase in production when conversion to the standard sizes is completed is estimated at 10 to 15 per cent of present bar capacity. Similar results are expected from the establishment of standard sizes of steel tubular products, covered by schedules 6, 9, 10, 11 and 13. Under schedule 13, 65 per cent of the sizes carried on manufacturers' books and previously produced have been eliminated.

Products dealt with in the NESS work represent approximately 70 per cent of the entire steel production of the United States. Because of the complexity of the industry and the many ramifications of specifications it is impracticable to show in any statistical manner the benefits of the NESS work to the entire steel program. The industry has reported a 5 to 15 per cent increase in effective use of existing facilities for a number of commodities through longer runs, less roll changes, less rejections and greater recoveries, etc.

Conservation of critical ferroalloys was promoted by the modification of

(Please turn to Page 165)

The Answer to Your Question

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**THEY NOT ONLY MEET, BUT SURPASS,
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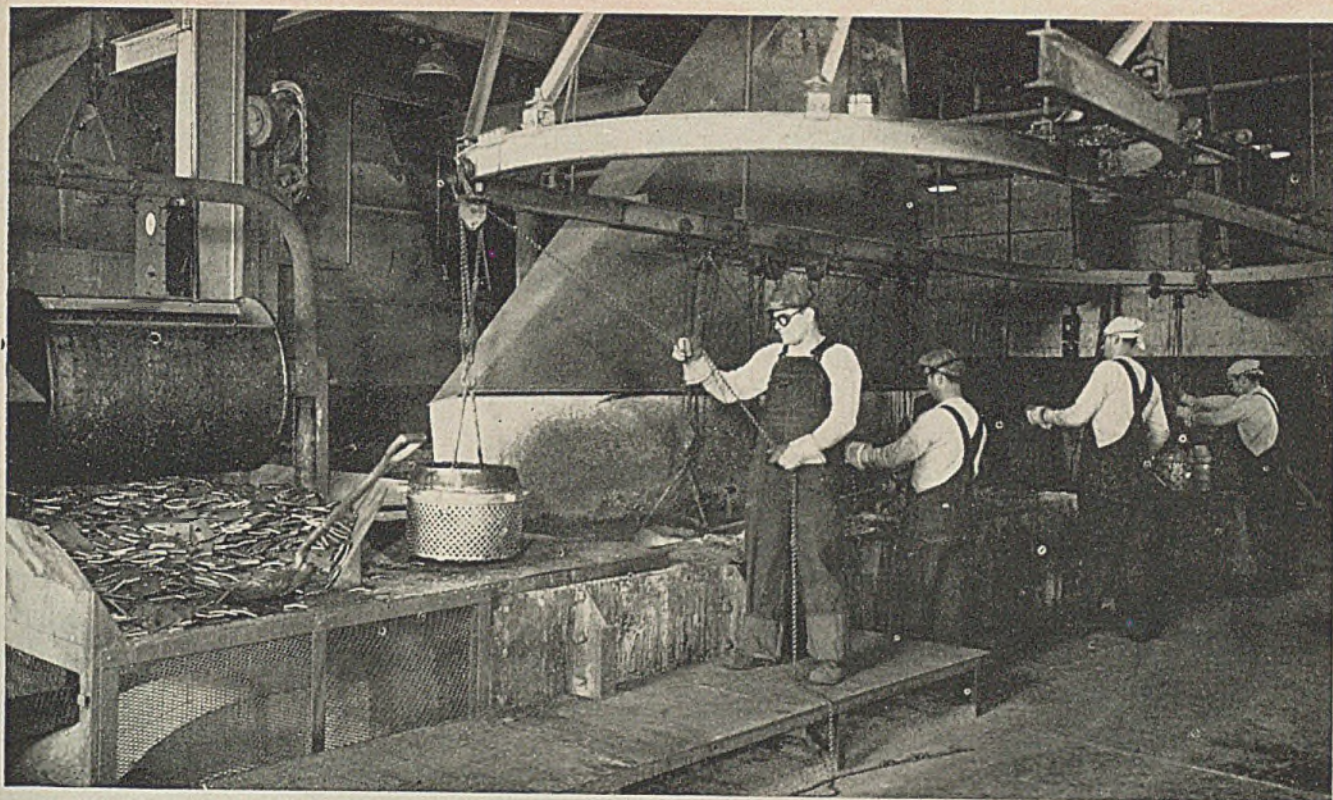
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CRANE VALVES

STEEL



Material to be coated is handled in and out of lead baths by perforated baskets and monorail system

HOT DIP LEAD COATING

Conserves Zinc

Lead coating process is similar to that of galvanizing. Pin holes in coating are minimized by having base metal clean, using a high-grade flux, employing proper immersion time and bath temperature, and avoiding hydrogen formation at time of coating. Lead considered satisfactory substitute for zinc

EARLY in 1941, because of the increasing need for zinc in connection with the war effort, it was felt that steps should be taken toward finding a substitute for zinc used in the hot dipped galvanizing of pole line hardware, thereby releasing this essential material for more urgent requirements. Several substitute materials were considered, including organic finishes, lead and various alloys of lead. Since many of the metals which might be used in lead alloys were also critical materials required for war purposes, effort was concentrated on the use of commercial lead, particularly since the available supply seemed abundant.

The value of lead coatings as a protection against corrosion of iron and steel has been discussed to a considerable extent in the literature and some of the difficulties of application have been pointed out. Lead coatings are resistant to atmospheric corrosion and will, no

doubt, give long protection to iron and steel if a continuous film substantially free from pin holes is applied. It is recognized, however, that pin holes are usually present in lead coatings applied by hot dipping. A superficial rust often appears on lead coated parts shortly after application of the coating and it is felt by some that the pin holes are quickly sealed, affording better protection to the underlying iron and steel than expected or than its appearance might indicate.

Since no alloying layer is formed between the iron and lead, the iron surface is not wetted by the lead and, unless proper care is taken in the application of the coating, the lead forms in globules on the work leaving part of the steel

surface exposed. This difficulty is greatly reduced in the method later described, thus making the process practicable for large scale production.

Coating of steel by the lead dipping process is not new by any means, but as far as known, was not being used commercially on a large scale although some smaller units were in operation. The process being used by the Western Electric Co. in the hot dipped lead coating of pole line hardware at the Clearing plant is as follows:

Cleaning and Pickling:

1. Oil is removed from the parts by any suitable means.

2. Rust and scale are removed in a solution of sulphuric acid. A 6 to 12 per cent sulphuric acid solution containing an inhibitor and operated at approximately 160 degrees Fahr. is satisfactory. The iron content of the acid should not increase beyond 5 per cent.

3. The parts next are immersed in a 5 to 10 per cent solution of hydrochloric acid containing an inhibitor for a period of 10 to 15 minutes at a temperature of 120 to 150 degrees Fahr. The iron content of this solution should not increase beyond 5 per cent.

4. The parts then are immersed in a water solution of zinc ammonium chloride flux at room temperature until they are completely wetted. This solution is made

By W. YONKMAN
Engineer
Western Electric Co. Inc.
Chicago



WHAT ONE COMPANY DID:

JULY '36 - SHOP "A" ORDERED.....10 PITS

NOV. '36 - SHOP "A" ORDERED..... 5 PITS

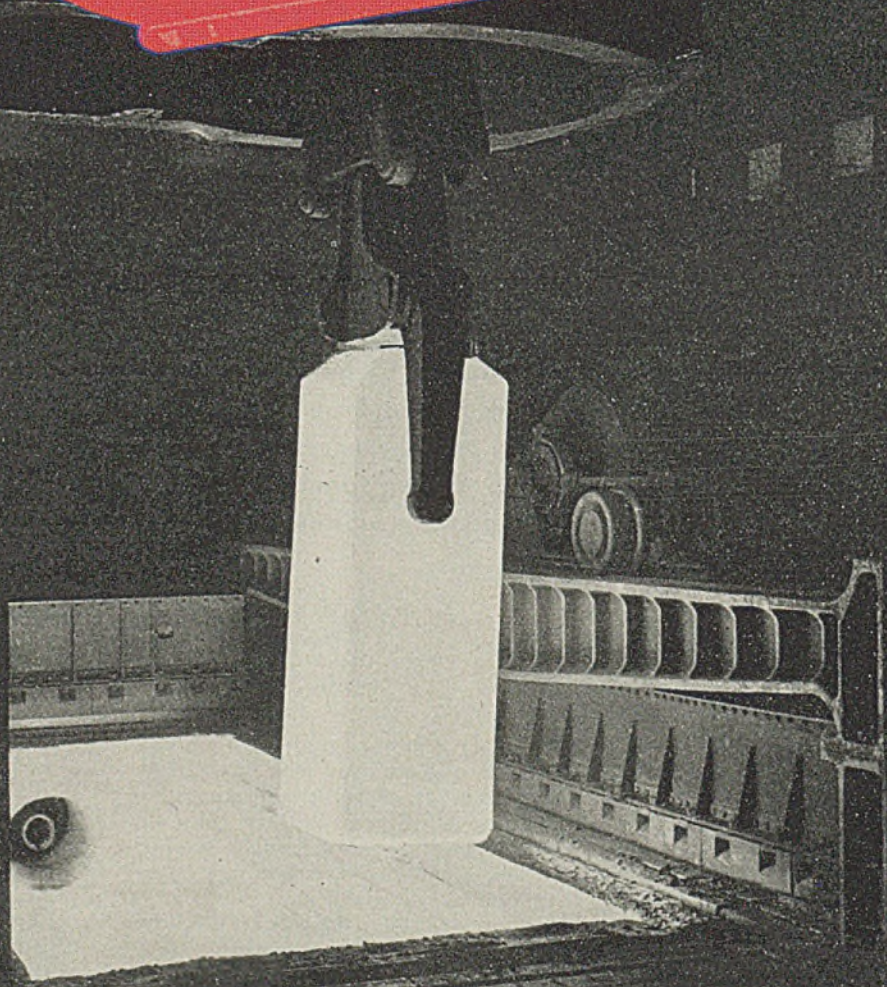
JULY '41 - SHOP "A" ORDERED.....10 PITS

JAN. '43 - SHOP "B" ORDERED..... 5 PITS

FEB. '43 - SHOP "A" ORDERED..... 5 PITS

FEB. '43 - SHOP "C" ORDERED..... 8 PITS

43 PITS IN ALL!



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"Proof of the Pudding is in the eating thereof.."

and proof of the *superiority of Surface One-way-fired Soaking Pits is in their overwhelming acceptance by practical steel men

● Theories come and theories go...but it's the practical, efficient, results-producers that endure. That's the way it is with soaking pits.

With one steel company, for instance, ten Surface One-way-fired Soaking Pits were installed. They proved their superiority, produced desired results. Then more SC pits went in...not one repeat order, but five times. This has happened again and again...in shop after shop. It is truly the "proof of the pudding."

If you want to see how SC pits operate—how they do more work, better work, at lower cost—just accept our invitation to come and watch them in actual service.

Invariably, steel men who see these pits hard at work in the production of steel for war, come away convinced that these tried-and-proved one-way-fired pits are tops.

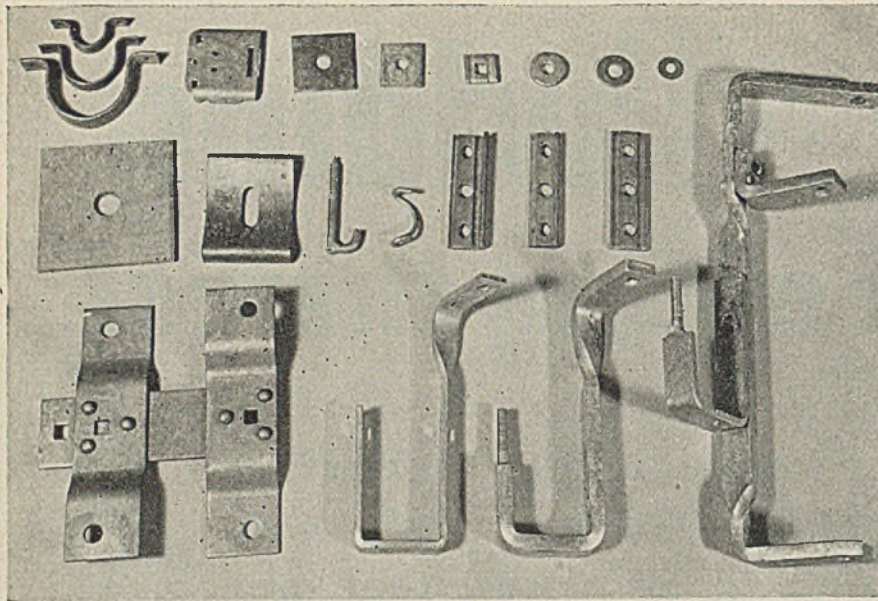
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FOR DRY BLAST USE SC
KATHABAR MOISTURE
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COMBUSTION

JANITROL GAS-FIRED SPACE HEATING EQUIPMENT • KATHABAR SYSTEMS FOR DRY BLAST



Typical pole line hardware lead coated to prevent corrosion

by dissolving five parts of zinc chloride and one part of ammonium chloride by weight in six parts of water. This flux solution should be kept reasonably free of iron sludge at the bottom of the container. Concentration of iron in this solution should not increase beyond 8 per cent.

It is necessary that the parts remain wet with this flux solution before dipping into the molten lead.

Note: Water rinsing is not to be used after any of the foregoing operations except after the first operation if alkali cleaners are used.

Lead Dipping: The bath consists of commercially pure lead and is maintained at a working temperature of 690 to 710 degrees Fahr.

How Flux Is Prepared

The molten bath is covered with a layer of fused zinc ammonium chloride flux. This fused layer is prepared by covering the bath with zinc ammonium chloride crystals and allowing them to melt and fuse thoroughly before the dipping operations begin. The fused layer should be prepared at least two hours before the parts are dipped in the bath. When the flux is in its best operating condition, it is a thoroughly fused dark liquid layer with a minimum thickness of 1/8-inch which gives off little fumes when at the proper working temperature. No additions are required for several days after operations begin, except replacement of flux which is carried out by the work to prevent areas of exposed metal on the surface of the bath. When such additions are necessary, they should be made in small quantities and in such a way that unfused flux crystals do not come in contact with parts being dipped. In no case should such additions be made at the exit end of the pot. When the pot is inactive, larger quantities of flux may be added provided such additions are made at least two hours before the pot is used.

Parts are completely submerged in the molten bath passing through the fused

flux layer. The container holding the parts is passed in and out of the bath through the flux several times to insure contact of all the parts with the flux. They are then submerged in the bath or allowed to float until heated to the temperature of the bath. Immediately before withdrawal, they are again passed

several times through the molten flux until completely coated. Immediately after removal from the bath, excess metal is removed by suitable shaking or centrifuging depending on the nature of the part. After removal of excess metal, the parts are quenched in hot water and removed quickly from the water to expedite drying. In the case of small parts, tumbling in sawdust may be advantageous. Parts not completely coated may be reprocessed without removing the coating already on the parts, by beginning with hydrochloric acid dipping operation.

The molten lead bath does not give satisfactory results until after it has been in operation for several days and from then on it seems to improve with use, an observation which was made on an experimental as well as a commercial basis. Although an analysis of the bath has been made periodically, lack of time has prevented a study to determine the change which takes place resulting in this improvement.

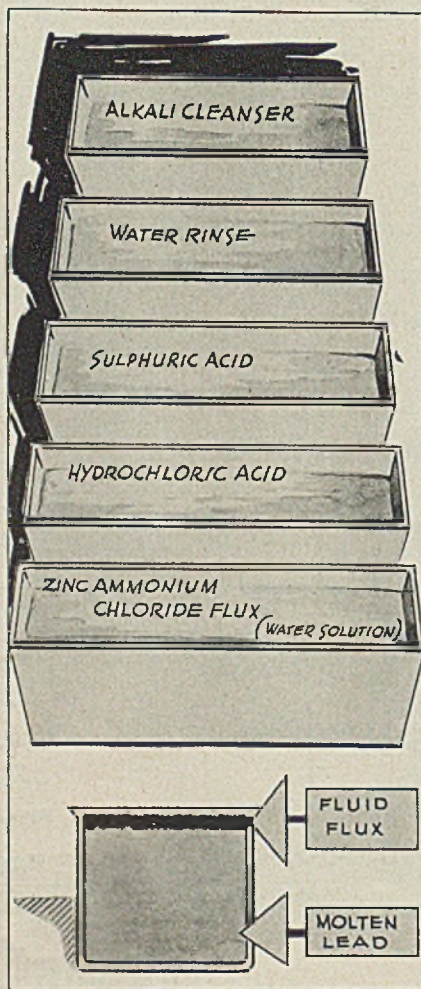
The weights of coating produced in the process vary over a wide range between 30 and 200 milligrams of lead per square inch. The type of parts, the temperature of the bath and the degree of centrifuging or shaking to remove excess lead after dipping are determining factors in the weight of coating obtained. Lead coatings, in general, are somewhat thinner than zinc coatings produced by hot dipping.

Conversion Involves No Changes

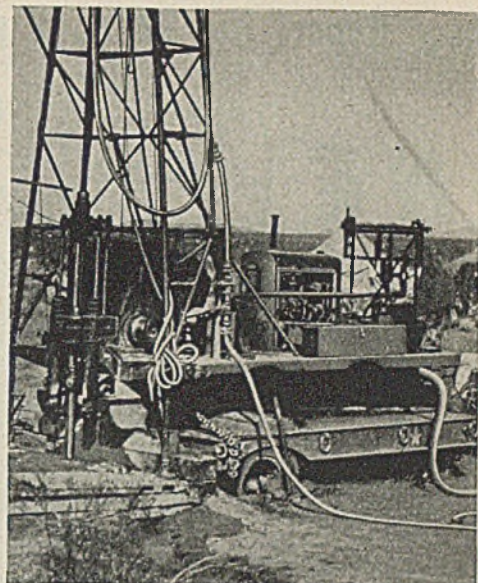
No changes in equipment are necessary in converting a hot galvanizing unit to a hot lead dipping unit. The molten zinc may be ladled from the galvanizing pot as completely as possible and replaced with lead. The lead bath then is heated to the temperature formerly employed for galvanizing which will float the residual zinc to the surface where it can be removed by skimming. Frequent skimming for a few days will eliminate the zinc except for small quantities amounting to a few tenths of a per cent which appears to alloy with the lead. The bath should not be used for coating during this skimming period. When the zinc is removed, the temperature of the bath is lowered to the desired point for lead dipping and the unit is ready for operation. The dipping unit employed by the Western Electric Co. is capable of producing approximately 3600 pounds of lead coated hardware per hour. This unit was converted from zinc to lead dipping in July, 1941.

From an operating standpoint, lead dipping has several advantages over hot galvanizing. There are no losses of metal due to dross and the time required to remove dross is eliminated. The life of the equipment is lengthened considerably due to the lower temperature employed and to the fact that the lead and iron do not alloy. The lower temperature

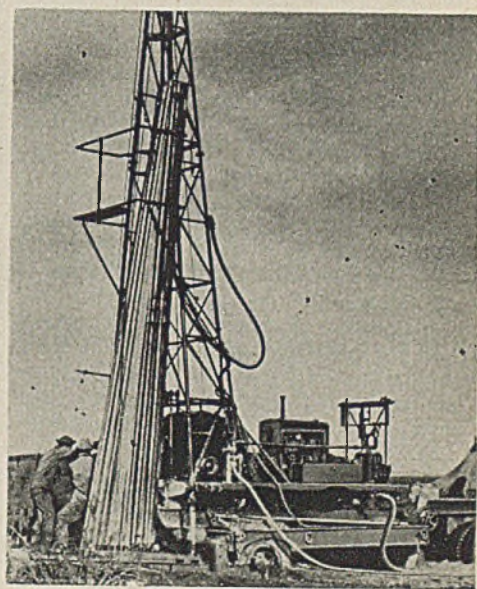
(Please turn to Page 168)



Various operations involved in lead-coating process. Lead bath is depicted at bottom of diagram



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The George E. Failing Supply Company of Enid, Oklahoma, in conjunction with the U. S. Army Corps of Engineers, designed the needed high-speed, portable drilling rig. Working with them, United States Rubber Company provided various types of special hose—rugged enough for this rough, tough service but extra lightweight to keep pounds at a minimum.

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UNITED STATES RUBBER COMPANY

November 15, 1943

NE (National Emergency) ALLOY STEELS

—Replacement, Not Substitution

SINCE INCEPTION of the War Production Board's NE steel program, there have been a great many conflicting statements and wild guesses about the difficulties and complications in choosing and using NE substitutes for SAE grades. Contrary to widespread opinion which has arisen among steel users, the necessary replacements are neither difficult nor complicated.

Large manufacturers who took nobody's word for the truth on NE steels but went ahead and made extensive tests of their own have known this fact for some time. Others are learning it now or will learn it later as it becomes more obvious to everyone.

One of the best examples of successful NE replacement is offered by the airplane division of the Curtiss-Wright Corp., which has a number of big plants engaged in aircraft manufacture. Engineers of this company have made replacements along as broad lines as possible, continuing a trend which started some time before the NE era—the simplification and standardization upon a few necessary grades. The NE program has not interfered with this trend but on the contrary has stimulated it, according to Eric Dudley, materials engineer for Curtiss-Wright's airplane division.

"Almost All" SAE Grades Replaced

"We are sometimes asked for specific examples of successful NE substitution," says Mr. Dudley, "and the answer is simple but perhaps momentarily baffling to those who think there is some mystery about the proper use of NE steels. It is as follows: There are no specific instances, because we have replaced *almost* all SAE grades with NE analyses.

"The subsequent question—How do these substitute grades perform under given conditions and how do they react in forging and heat treating—is answered in the same manner: They perform and react just the same as the SAE grades they have replaced and equally good results are obtained."

This casts considerable light on the NE steel situation. The actual replacements will be of interest to all steel consumers.

By the time NE steels were introduced, Curtiss-Wright had already simplified its steel requirements to a great extent. The statement "Give us three

By GEORGE BISSETT
President
Bissett Steel Co.
Cleveland

steels and we'll make a good airplane", had come to be true with a few minor exceptions. Curtiss-Wright has standardized on the following NE grades of bar and rod stock:

Nickel-Chrome-Molybdenum NE-8620, NE-8630 and NE-8740. These replaced SAE grades 2330, 2512, 4037, 4130 and 4140. These NE analyses, plus SAE-4340, for which Curtiss-Wright has discovered no satisfactory NE replacement, comprise approximately 90 per cent of the steel used in building airplanes, exclusive of the engines and propellers. The remaining 10 per cent is made up of NE-9260 and SAE grades 1020, 1025, 1035, 1112.

With a single exception, the NE grades used are handled in exactly the same manner as SAE steels were previously, passing through similar heat treating, forging and machining operations with end results which are equal, for all practical purposes, to results achieved with the richer alloys. *For this reason, NE steels are used interchangeably with SAE steels of comparable analysis wherever both are available simultaneously.*

The one exception occurs in the case of NE 8630, which requires an additional draw at 900 degrees, though only after normalizing. This is to bring the yield point up to that previously attained with SAE-4130 and 4140.

Following is a record of the change over and the processing involved in manufacture of six important airplane parts made in Curtiss-Wright plants:

—Landing gear attachment forgings, (Fig. 1) formerly SAE-4130, now NE-8740, which are bought already forged. Curtiss-Wright machines their surfaces on a straddle mill, broaches a rectangular hole and burrs all the edges. The forgings are then oil quenched from 1525 to 1575 degrees Fahr., giving a tensile strength of 150,000 pounds per square inch. Then they are cleaned and cadmium plated.

—Engine mount tubing, Fig. 2, formerly SAE-4130, now NE-8735, size 2.525 inches outside diameter by 2.046 inches inside diameter. These tubes are quenched in oil from 1525 to 1575 degrees Fahr., producing a tensile strength of 180,000 pounds per square inch. Next

they are drilled, reamed, and cadmium plated and painted.

—Similar tubing, formerly SAE-4130, now NE-8630, size 1-inch outside diameter by 0.065-inch inside diameter. This tubing is used as received, so far as heat treating is concerned, and is faced, drilled, reamed, cadmium plated and painted.

—Engine mount forgings, Fig. 3, formerly SAE-4140, now NE-8740, bought already forged, milled, drilled and reamed. They are heat treated at 1500 to 1550 degrees Fahr. to give a tensile strength of 150,000 pounds per square inch, cleaned, cadmium plated and painted.

—Special bolts, formerly SAE-2330, now NE-8630, size 1½-inch hexagon. These are purchased ready for use, but the processing is as follows: They are milled from the bar, quenched in oil from 1525 to 1575 degrees Fahr. to give 150,000 pounds per square inch tensile strength, then are drawn at 975 degrees Fahr. and cadmium plated.

Bolts, Carburized Parts Now NE

—Two similar bolts, sized 9/16 and 1/2-inch respectively, same analysis, are made by Curtiss-Wright with a forged head and machined threads, are hardened at 1525 to 1575 degrees Fahr. to 125,000 pounds per square inch tensile strength with a draw at 1125 degrees Fahr. followed by a cadmium plate.

—Several different carburized parts, formerly SAE-2512, now NE-8620. A typical example is a plate ¾-inch thick, 1½ inches wide and 2 15/16 inches long, which is milled, routed, drilled and reamed. It is carburized with a pack hardened depth of 0.025-inch and a core strength of 120,000 pounds per square inch, then is cadmium plated.

Within the range offered by NE series available, the trend is toward standardization *upward* in selection of steel for the job of building airplanes. Curtiss-Wright engineers try to eliminate the specifying of small quantities of low physical property steels along with large quantities of high physical property steels when the latter will do the job required of the former, in addition to its own job. The principal reasons are:

—There is always a chance of getting low physical property steel stock mixed with high physical property steel in shipping, storage or production.

—In most cases, it is more efficient and economical to buy (for instance)

buy more
war bonds



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1000 pounds of high physical property steel than it is to buy 950 pounds of the more expensive steel and 50 pounds of the less expensive.

—It is always more economical to handle and segregate fewer grades of steel.

—This use of alloy steel, when designed into an airplane, offers the best weight-strength ratio with a resultant weight saving.

It will be noticed that the great majority of NE replacements have been made in the 8000 series, and that the 9000 series is not as popular with this aircraft manufacturer. There are several common-sense reasons for this. Curtiss-Wright spent a great deal of time, money and engineering talent on extensive tests conducted in the 8000 series, and have for some time been in production with these NE steels. The results of this research have been correlated with research done by the engine and propeller manufacturers. To make a similar series of tests on the 9000 series before changing over would have slowed production, and furthermore, the stocking of both series would result in much inventory duplication.

This does not mean that the NE-9000 series will not make good parts, or that these grades are inferior to the 8000 series of NE steels. Rather the opposite is true, but having through long experiment proved the suitability of the 8000 series for their parts, this aircraft manufacturer, like some others, decided to standardize on the 8000 series to save valuable time and the cost of additional investigation of the NE-9000 steels.

From the steel man's viewpoint, standardization within the 8000 series is desirable because mills can get more efficient production when running without interruption on a series which is familiar, and the warehouseman who stocks these steels is also benefited since it saves the stocking of another type of steel. Furthermore, the mills have had enough trouble with the NE steels, which brings up an interesting sidelight on the situation:

In the Middlewest, where the scrap drives have brought great quantities of

low carbon scrap from the farming regions to the mills, this preponderance of standard low-carbon scrap made the melts relatively easy to figure. But in the East where more alloy scrap was obtained, the steel mills were frequently thrown off in the calculation of their melts due to the high alloy content of the scrap.

Out of the whole confused situation, certain facts of permanent benefit to industry are beginning to emerge. One of these is that industry generally has been

oversold on the idea of high alloy steels with a special analysis for every job that comes along, contributing in a large degree to the multiplicity of different alloy grades. A questionably high factor of safety has been maintained in the use of many SAE grades.

Another fact of paramount importance is that NE steels are here to stay. Many of the grades now being used are adequate for their jobs, and there is no reason to change back to the richer alloys, which were actually, in some cases, a waste of scarce alloy materials. Eric Dudley makes very pertinent comment on the terminology used to describe the changeover to NE grades:

"The word 'replacement' is a better word than 'substitute' to use in talking about NE steels," Mr. Dudley says. "We have replaced almost all SAE grades with NE grades very successfully, and there is no reason to believe that these

(Please turn to Page 170)

For information on development of NE steels and data on their properties, see STEEL, Feb. 9, 1942, p. 70; March 16, p. 72; June 8, p. 66; June 15, p. 66; July 13, p. 80; July 20, p. 86; Aug. 3, p. 70; Aug. 17, p. 40; Aug. 31, p. 41 and 76; Sept. 7, p. 78; Oct. 19, p. 66; Nov. 9, p. 96; Dec. 28, p. 27; Jan. 25, 1943, p. 84; Feb. 22, p. 102; March 1, p. 94; March 8, p. 90; March 22, p. 78; March 29, p. 76; April 5, p. 116 and 118; Aug. 2, p. 100; Sept. 6, p. 112; Oct. 18, p. 97.

For reports from users of NE steels, see Nov. 16, 1942, p. 106; Nov. 23, p. 90; Nov. 30, p. 62; Dec. 7, p. 112; Dec. 14, p. 99; Dec. 21, p. 70; Jan. 11, 1943, p. 60; Jan. 18, p. 66; Feb. 1, p. 100; March 8, p. 109; March 15, p. 96; March 29, p. 72; April 26, p. 84; June 7, p. 106; June 14, p. 98; June 21, p. 92; July 28, p. 88; Aug. 2, p. 94; Aug. 23, p. 107; Aug. 30, p. 66; Sept. 6, p. 106; Sept. 20, p. 120; Nov. 8, p. 110.

For latest revised listing of NE ALLOY steels, see Oct. 18, 1943, p. 97.

For list of NE CARBON steels, see March 8, 1943, p. 90.

For latest revised list of AMS (Aeronautical Materials Specification) steels, see Aug. 9, 1943, p. 92. AMS nonferrous alloys are also listed there.

For details of WD (War Department) steels and complete listing, see Feb. 8, 1943, p. 80.

For STEEL's latest "Handbook on NE Steels" and the "NE Steel Selector", address Readers' Service Department, Penton Bldg., Cleveland 13. Price \$1.00 per set.

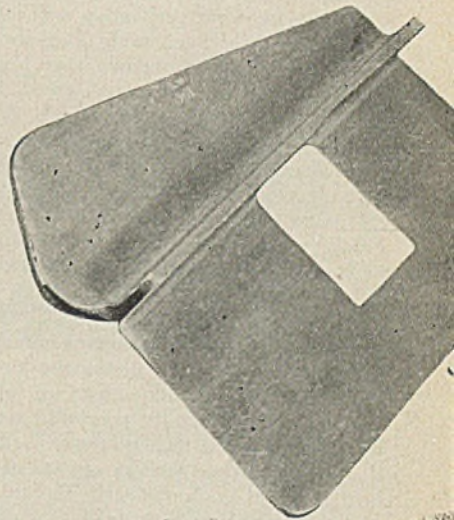


Fig. 1 (Upper right) — Landing gear attachment, a forging formerly made from SAE-4130 and now produced from NE-8740

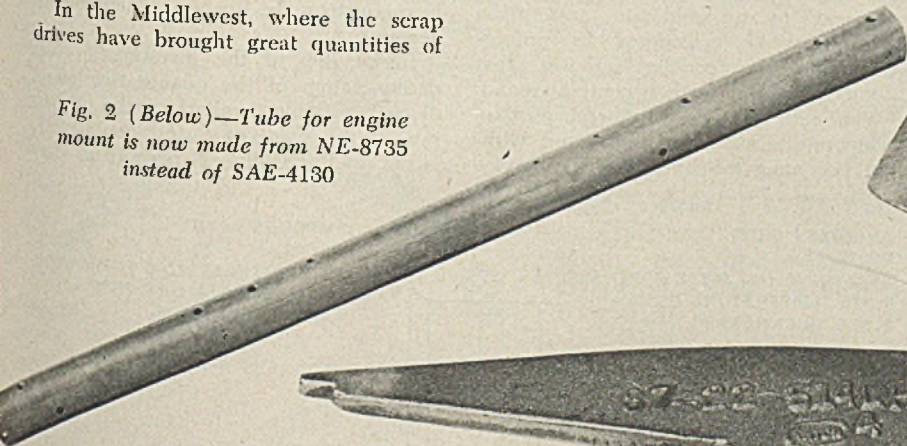


Fig. 2 (Below) — Tube for engine mount is now made from NE-8735 instead of SAE-4130

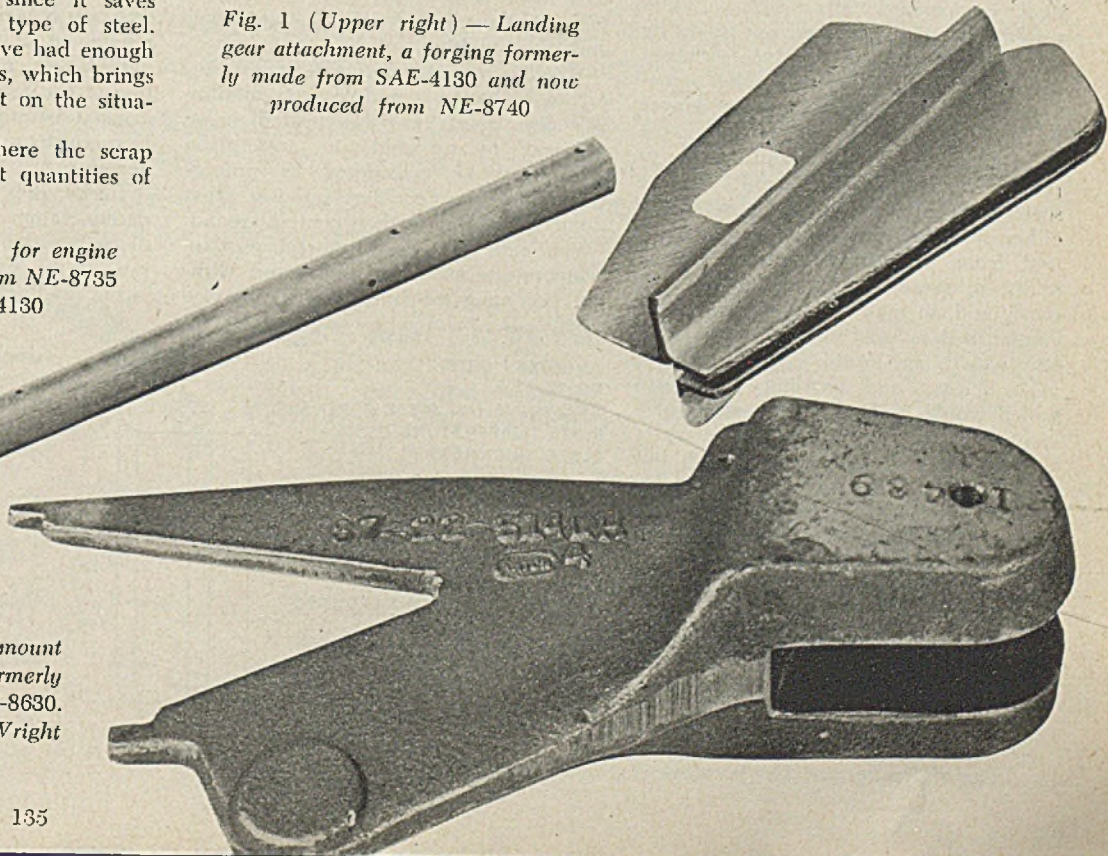


Fig. 3 (Right) — Engine mount forgings for aircraft, formerly SAE-4130 and now NE-8630. All photos from Curtiss-Wright Corp.

A Tentative Method That Can Be Used To

PREDICT WELDING CONDITIONS

Scheme is outlined which permits determining in advance just what welding currents and arc-travel speeds to use to be sure to produce a weld joint that retains the desired ductility in the base metal

HARDENING and embrittlement of the heated zone next to an arc weld prevents the use of welding on many low-alloy steels and the higher carbon steels. When these steels are welded with the same procedure used on low-carbon steels, cracking frequently results in the low-alloy steels just outside the weld.

It is known that preheating will avoid cracks, but how much preheating should be used? It also is known that higher currents and slower arc-travel speeds will diminish the tendency to crack. But who can tell the welding operator exactly what currents and speeds to use either with or without preheating? If the atmosphere temperature drops to 0 degrees Fahr., what changes can the operator make in his procedure to avoid cracking?

Juggling Variables Hopeless?

Once suitable conditions are found for welding 1/2-inch steel plates the design might be changed suddenly to use plates 1-inch thick. When the procedure usually followed for 1/2-inch plates is used for the 1-inch designs, cracks appear as the heated metal cools faster in the thicker plates. If a change is made to a new steel composition all these variables would have to be worked out again by slow cut-and-try methods. Even a change from one heat of steel to another sometimes results in cracking at the danger line near the weld.

To juggle the variables and be able to predict conditions for good welding seemed hopeless. The result was that either many low-alloy steels were prohibited from structures requiring welded joints, or were welded with elaborate, costly and, in many cases, wasteful precautions. A rational solution of the problem would enable the engineer to use joint designs and welding procedures which would insure for each steel sufficient ductility in the heated zone under the weld for the service intended, but would not lead him to wasteful lengths.

Here is outlined a proposed system for predicting in advance, and without resort to a welding test, exactly what welding conditions will preserve a chosen ductility

By GILBERT E. DOAN
And
ROBERT D. STOUT
Lehigh University

in any steel of the low-alloy or higher carbon type, of any plate thickness and joint design, when welded at any temperature, with any combination of current, voltage and arc-travel speed, over a wide range of these variables. It is a product of studies in fundamentals of arc welding sponsored by the Engineering Foundation and of investigations of the fundamentals of arc welding carried on at Lehigh university over a period of 12 years.

If the system proves valid, it will enable the design engineer to choose a steel for his design and specify a welding procedure (current, voltage, arc speed and preheat temperature) on the basis of two tests only—the Jominy and the ductility (notched-bar bend) test.

It should be pointed out that the proposed system has *nothing to do with the weld metal deposited*, but only with the properties of the heated zone adjacent to the weld. It is assumed also that the base metal is of proper quality in regard to laminations, hot-shortness, strain-aging and quiet melting.

Cooling rate determines hardness: Increase in hardness and loss of ductility at any point in the heated zone adjacent to a weld in any given steel may be considered as proportional to the cooling rate at that point. Weldability then centers around, "What rate of cooling from the welding temperature will this steel stand without becoming too brittle for the service

intended?" Welds cool fastest in fillet joints, between thick plates, with low arc current and voltage, high speed of arc travel and with low initial temperature of the base metal. (The combination of plate thickness with joint design is called "joint geometry" here.) These are the variables involved in welding.

To explain the term "joint geometry", it is obvious that greater plate thicknesses give rise to higher cooling rates by virtue of the greater mass of metal which is available to conduct heat away from the weld area. It was suggested that there might be an "effective radius" from the center-point of the weld beyond which metal in the plate cannot be of any significant help in carrying away heat, at least in the period in which the heated zone is cooling through the transformation range. If so, it would be the metal within this radius that is effective in absorbing heat from the weld zone. The larger the mass of metal within this area, the faster would be the cooling rate in the heated zone.

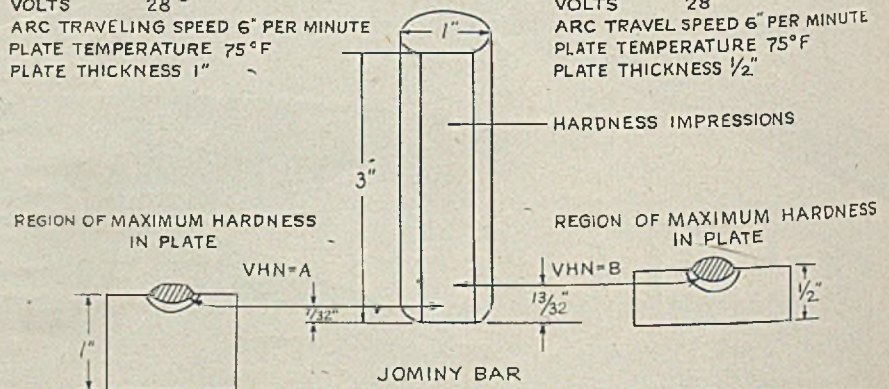
Test 3-Inch "Effective Radius"

This suggests a method of reducing the effect of weld joint shape and the plate thickness on cooling rate to that exerted by the mass of metal within the "effective radius". Evaluation of the mass then becomes the problem of calculating the cross-sectional area lying within this radius. First it must be decided how large a radius should be chosen. Rather arbitrarily, a radius of 3 inches was taken to test the concept. A refinement of the assumption would be obtained by making the radius a function of the heat input, but results of the original assumption have been sufficiently useful to make further refinement unnecessary.

Initial step of the investigation was determination of the quantitative effect of each variable involved on the cooling rate at the point of fastest cooling adjacent to the weld. Experimental data

AMPERES 175
VOLTS 28
ARC TRAVELING SPEED 6" PER MINUTE
PLATE TEMPERATURE 75°F
PLATE THICKNESS 1"

AMPERES 175
VOLTS 28
ARC TRAVEL SPEED 6" PER MINUTE
PLATE TEMPERATURE 75°F
PLATE THICKNESS 1/2"



From material issued by the War Metallurgy Committee of NDRC and published in July, 1943, *Welding Journal*.

Welding conditions translated into terms of Jominy test bar positions



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on which the system is based were obtained in the following way:

Hundreds of welds were made with different combinations of all the above-mentioned variables, using the same heat of steel. Each weld was sectioned and the hardness measured at the hardest point under the weld. This gave a wide range of hardness values—in fact, it gave all possible hardness values for that steel within the practical range of welding conditions.

Then a bar of the same steel was heated to 2100 degrees Fahr. for 30 minutes. This gave it a grain size approximately the same as the grain size reached in the hardest part of the weld zone in this steel. This bar, called a Jominy test bar, was then end quenched by a water jet. As the wet end was cooled very rapidly, it attained maximum hardness. The farther away from the water, the slower the cooling rate in the bar and the lower the hardness. Thus this single bar gives an entire range of cooling rates and, if a flat is ground on the side of the bar, a whole range of the resulting hardnesses can be measured from one end of the bar to the other. The specimen thus gives the entire range of hardnesses which can be attained in this steel.

If the hardness of each of the hun-

dreds of experimental welds mentioned is now matched with its corresponding hardness on the Jominy bar, then the cooling rate in the weld corresponds with the cooling rate at that point on the test bar, as shown in accompanying diagram.

Actually, therefore, each combination of welding conditions corresponds with a position on the Jominy test bar. This is the essence of the proposed system. Any combination of welding conditions, joint thickness and design, initial temperature, current, voltage, arc-travel speed, corresponds to a single Jominy position. Once each possible combination of welding conditions and joint geometry has been reduced to a single Jominy position, the problem is greatly simplified.

For example, a butt weld between 1-inch thick plates, welded at 75 degrees Fahr. with 175 amperes, 28 volts, at 6 inches per minute, corresponds to a Jominy position 7/32-inch from the quenched end. If the plates are only 1/2-inch thick the position is 13/32-inch. If a current of 225 amperes is used for the 1-inch plates the Jominy position is 9/32-inch. If the first set of welding conditions is changed from 75 degrees to 400 degrees Fahr. preheat, the Jominy

position at which the cooling rate corresponds with the weld cooling rate becomes 12/32-inch. Thus every possible combination of welding conditions and joint geometry represents a specific cooling rate, that corresponds to a certain Jominy position.

The Jominy position at which the cooling rate in weld and bar are equal then represents those welding conditions. In the system proposed here, these relationships are to be considered fixed and independent of the steel used. Of course, two or more combinations of welding conditions may give the same resultant cooling rate, the same Jominy position.

If the steel is now changed, a new Jominy test bar is run. But the Jominy positions still represent the same welding conditions as before. That is, the 7/32-inch position still represents the cooling rate in a butt weld between 1-inch thick plates at 75 degrees Fahr. with 175 amperes, 28 volts, at 6 inches per minute. Thus a relationship between welding conditions, cooling rate and Jominy position is established. The hardness at the chosen position on the Jominy bar of the new steel will be different from the hardness of a bar of the first steel at the same position, as was mentioned.

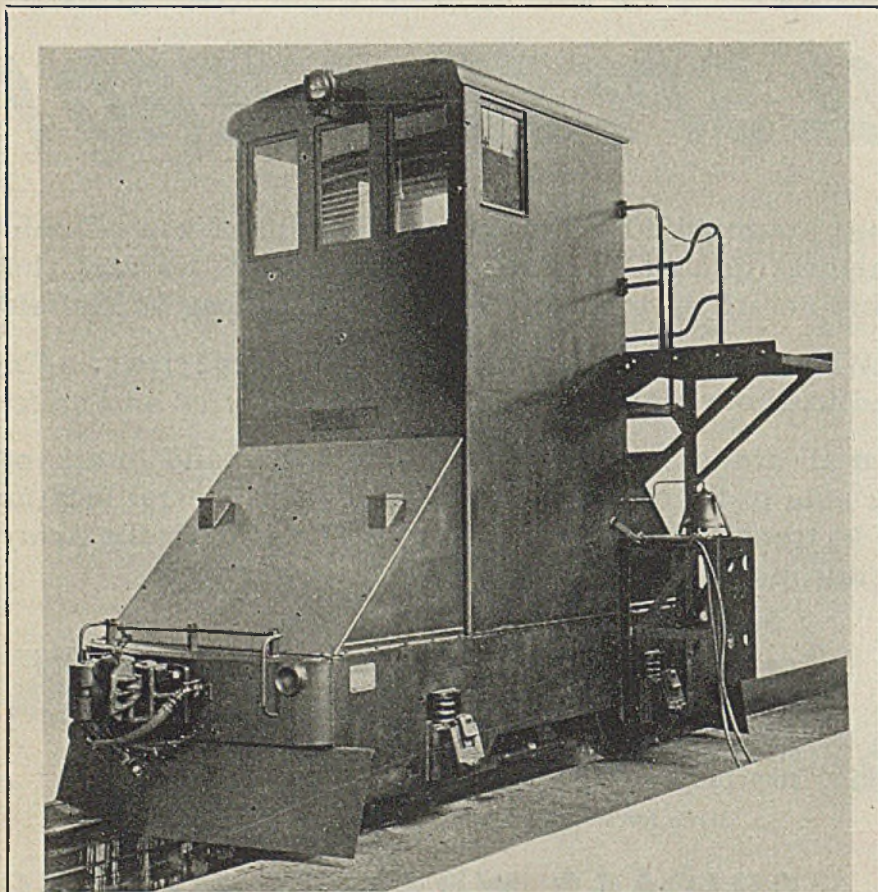
Since ductility, not hardness, is the critical value for the design engineer to preserve in his welded joint, he must first decide upon the degree of ductility which he considers necessary for the new steel.

Prepare Four Bend Specimens

Suppose he says he must have a ductility corresponding to a bend angle of 20 degrees in a notch bar bend specimen with a 1/8-inch radial notch. The Jominy bar for this new steel has a range of hardnesses from water quench at one end to air cool at the other. *The ductility which accompanies each hardness can be ascertained by preparing a series of, say, four bend specimens of the same steel and quenching each one to a different hardness so that the entire hardness range of the Jominy bar is encompassed by these four specimens. These are then bent until maximum load is reached. The angle of cracking is a measure of the ductility associated with each hardness. The hardness of that bend specimen, or interpolated value, which has a bend angle of 20 degrees then becomes the maximum hardness permissible in the weld. The Jominy position corresponding to this hardness then indicates the welding conditions which will result in sufficient ductility in the heated zone of the weld.*

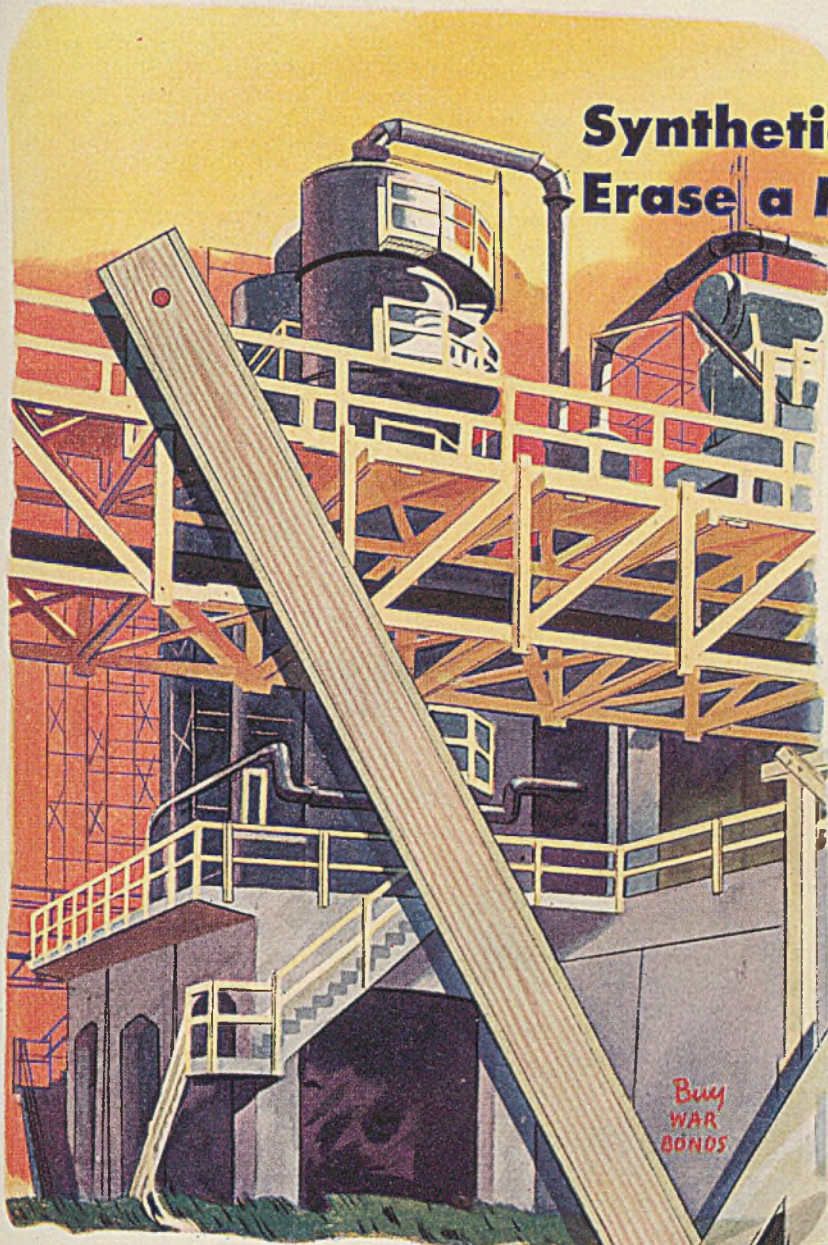
The question arises as to what accuracy can be claimed and what errors are evident. The most reliable measures of accuracy available are from certain test predictions which seem to indicate that the weld hardness of a steel for a given set of welding conditions can be predetermined to within 5 per cent. The absolute necessity for reliable Jominy tests

(Please turn to Page 158)



MECHANICAL GIRAFFE: Long-necked design of this General Electric 20-ton electric locomotive places the operator in an elevated position to better control the loading, quenching, and unloading of the hot coke to and from the cars which the locomotive hauls. The coke quenching unit recently was placed in operation by Lone Star Steel Co., Daingerfield, Texas

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Today, an increasing quantity of our rubber is the product of chemistry and engineering — made in a maze of pipes and tanks.

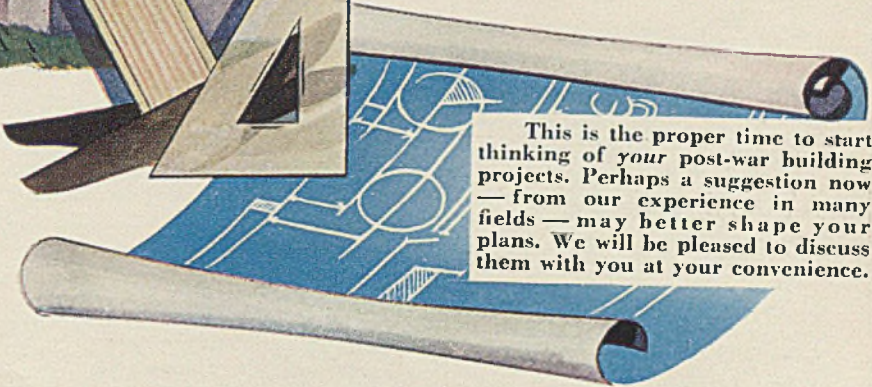
At Baytown and Houston, Texas; at Los Angeles, California, and Akron, Ohio, new synthetic rubber plants are being erected — or are now in operation — by the Goodyear Tire & Rubber Company for the Defense Plant Corporation. At Sarnia, Ontario, a plant is nearing completion for the Canadian Synthetic Rubber Corporation.

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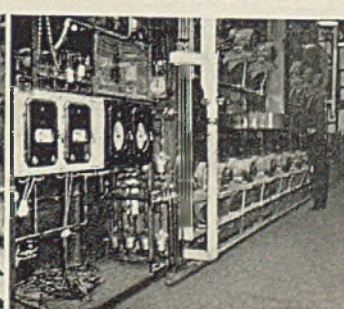
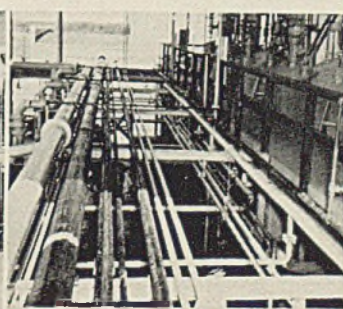
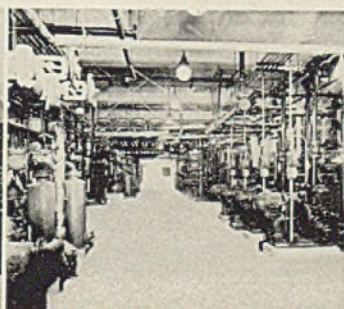
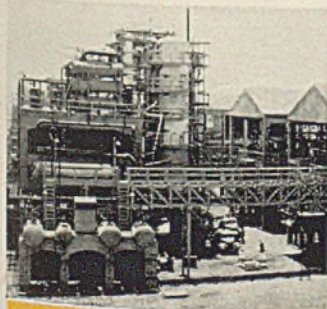


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Shock Loads Sabotage Wire Rope

{This is Number 15 in a series of informative articles on the conservation of wire rope. The previous article, Number 14, discussed the "Breaking-In Period" of wire rope. The present article endeavors to show how wire rope will last longer if shock loads are avoided after proper breaking in.}

* * *

LET'S AVOID SHOCK LOADS

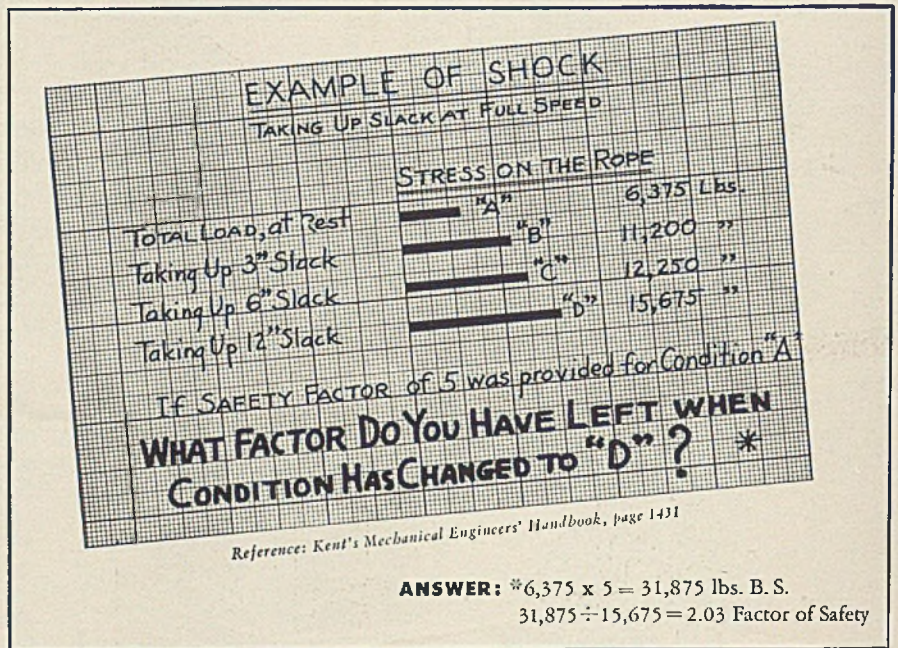
How simple things would be if there were no "ups and downs" in life. Take wire rope as an example. If operating conditions for your rope were always "peaches and cream" . . . if you didn't have to accelerate or speed up to meet performance expectations . . . if nothing went wrong to throw unexpected stresses on wire rope . . . if there weren't any "ifs," what a lot of unexplained things that now happen to wire rope we would never see.

But wire rope will continue to meet unexpected and unforeseen stresses. Knowing that, let's avoid *shock* loads that obviously overstress the rope.

WHAT ARE SHOCK LOADS?

Wire ropes are made to a specified catalog breaking strength. All hoisting equipment is designed with a predetermined line pull or load at drum for loads the equipment is made to handle. *Any load above the normal working load can develop a shock load.* And shock loads today are very definitely saboteurs of the war program.

Look, for example, at the chart. There you see what happens when a given load is applied suddenly to a slack rope. The



given load (in this case 6,375 lbs.) remains the same BUT the sudden impact to the rope the second that slack is taken up creates a shock load that may exceed the rope's elastic limit. The result may not be an immediate break, but, because the rope is overstressed, it often fails on another operating shift, with another operator, who does not know about the overstressed condition of the rope. When the slack to be taken up is 12", for instance, the stress on the rope *at impact* is 15,675 lbs. . . . or more than twice the total load at rest.

DOESN'T SAFETY FACTOR ABSORB SHOCK LOADS?

Safety factors for wire ropes vary with the type of equipment and use, as explained in article Number 4 of this series. Safety factors are based upon standard normal operations and cannot absorb the excessive shock loads, because these are beyond the normal working loads upon which the safety factor is figured.

HOW CAN YOU AVOID SHOCK LOADS?

1. Make sure there is no slack and no jerking of the rope at the start of loading.
2. Watch carefully the loads hoisted to see

that they are not beyond the rope's proper working load.

3. Do not allow rope to become fouled or jammed either on the drum or by jumping a sheave.
4. Start load carefully — too fast acceleration overloads the rope. Watch how the rope "takes it" on the pick-up. Apply power smoothly and steadily.

OPERATOR ALL IMPORTANT!

Provided the equipment is in good condition and the correct rope is properly installed, the responsibility lies squarely on the operator to avoid shock loads. A good operator is a good rope's best friend, and when this friendship ceases, the rope might just as well be cut up with a torch or emery wheel. An operator can "make or break" a wire rope. There is no substitute for experience in handling rope and a desire to get the most out of it.

ALL 15 ARTICLES AVAILABLE ON REQUEST

For the benefit of those who want helpful information on how to conserve their wire rope, Macwhyte Company, its distributors, or mill depots will gladly send a set of all articles when requested on your letterhead.

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Republic To Operate New Stack Under Predetermined Top Pressure

ALL EYES shortly will be focused on the new No. 5 stack of the Republic Steel Corp., Cleveland, which was blown in Oct. 28, as mentioned in the Nov. 1 issue of STEEL. In the next few weeks the furnace will be operated under a top pressure of 8 to 10 pounds with adequate blast being supplied by two 90,000 cubic foot turbo-blowers. Accurate test data will be compiled by engineers from the Case School of Applied Science. This will be the first blast furnace in the world to be operated under predetermined top pressures in order to learn what affect it will have on the rate of smelting operations.

Ore is unloaded from the boats by two 17-ton Hulett unloaders, each capable of handling about 800 tons of ore an hour. A 15-ton ore bridge with a 275-foot span over the ore storage yard and cantilever spans over unloading pocket and furnace stock bins, serves to place ore into storage and from storage to stock bins, via a 75-ton transfer car operating on the stock trestle. The storage yard,

275 x 750 feet, provides storage capacity for about 500,000 tons of ore and 150,000 tons of limestone.

Coke is delivered from the coke plant in hopper cars to two coke bins at either side of the skip, from whence it is automatically screened, weighed and discharged into the skip cars. The furnace charging mechanism is controlled automatically from the stockhouse and interlocked to insure proper sequence of movements on the several component parts of the charging system.

The stack has a hearth diameter of 27 feet, 18 tuyeres and is designed to make 1300 tons of iron per day. It will average five casts of 260 tons which will be handled in two 165-ton mixer type ladles to the open hearths or to the pig machine. Slag will be run into open pits and after solidification will be shoveled into cars for delivery to slag processing plant.

About 6,500,000 cubic feet of gas per hour is delivered from the oftakes through two 7-foot downcomers to dust

catchers where a portion of dry dust is trapped out, thence up through tile baffles in the gas washer and thence through two electric precipitators for final cleaning.

About 25 per cent of the clean gas is used in three 25 x 115-foot Bailey type welded stoves, each with about 200,000 square feet of heating surface. About 1,800,000 cubic feet per hour is delivered through a 54-inch diameter gas main to the coke plant for underfiring the coke ovens, and the balance for fuel on two 6000-horsepower boilers.

Approximately 3000 gallons of water per minute is circulated through the blast furnace coolers, is recovered and recirculated through the gas washer. Water from the gas washer and precipitators is passed through a Dorr thickener for the recovery of solids.

Air normally is supplied by two 90,000 cubic foot per minute at 30 pounds pressure turboblowers, one operating and one spare unit. Blast is heated to 1400 degrees Fahr.

The coke plant of 75 by-product ovens will consume 1700 tons of coal per day to produce 1200 tons of furnace coke, about 18,000,000 cubic feet of 500 B.t.u. coke oven gas per day and other by-products.

Bearing Gage Inspects Inside Diameters

A BEARING GAGE that can be used to inspect inside diameters for errors in straightness, roundness and size, is announced by Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford, Conn. Referred to as the Air-O-Limit, it is equipped with gaging spindles to inspect diameters from 2 to 5 inches. Outstanding feature of the unit is that the product being gaged is not contacted during the gaging operation by any mechanical gage point or gaging plug. The hole being checked will not be scratched or even burnished in any manner no matter how soft the metal surface.

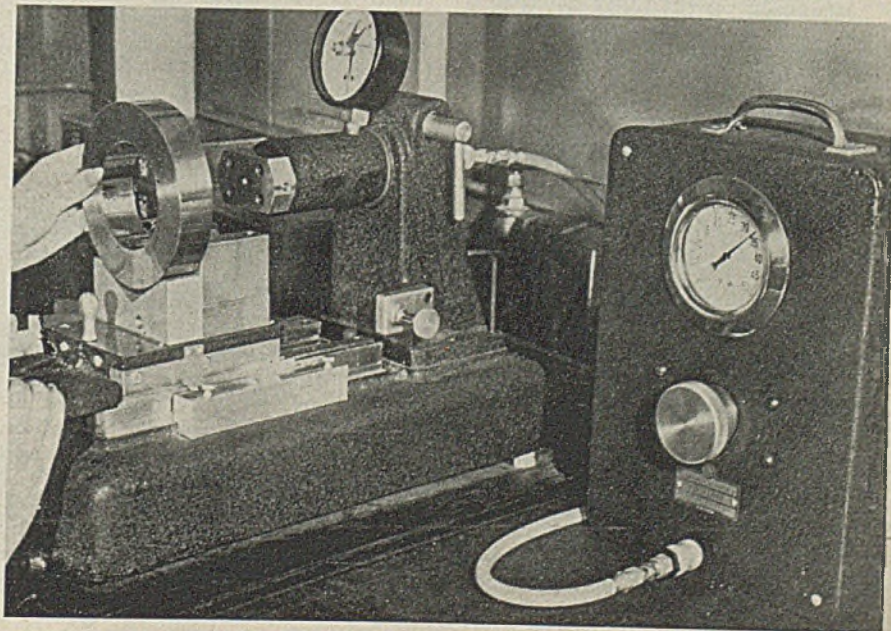
Principal components of the gage are the gaging fixture, gaging unit, and the air-supply equipment. The gaging fixture mounts the gaging unit and a ball-supported work carriage that positions the part over the gage plug. Two V-type anvils with T.C. inserts are fastened to the carriage. The one nearest the operator is permanently mounted to receive master ring gages for setting up the instrument, while the other accommodates the work. All master ring gages are of the same external diameter, and the internal diameter is made concentric with the outside diameter to close limits.

One gaging unit is usually sufficient for checking a bearing both before and after lead-indium plating as the indicator is usually calibrated with a 0.004-inch scale, which is sufficient for the tolerances involved. To make a new setup, the work anvil is exchanged by

removing four socket capscrews, and mounting the new anvil on a tongue in the base of the carriage. The gaging unit is held in the column by a clamp screw and can be readily interchanged.

The air-control cabinet contains a filter unit for removing moisture and foreign matter from air taken from the shop line. The filtered and regulated compressed air from the air-control cabinet is fed into the rear of the gaging unit, which is clamped to the column of the gaging fixture. Here the air

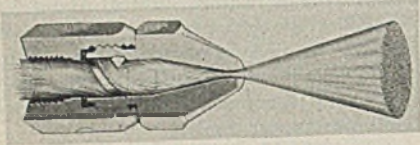
passes through a restriction tube and thence to two orifices placed on opposite sides of the gage plug. The clearance between each orifice and the adjacent bearing wall is usually 0.003-inch. The air gap so created restricts free flow of air from the orifices, and the back pressure is calibrated in terms of tenths on the indicator dial. Use of two orifices permits a spot reading at any plane. Consequently, out-of-roundness is detected by rotating the bearing, and taper by traversing the work carriage.



INDUSTRIAL EQUIPMENT

Spray Nozzle

A nozzle which produces a full-cone spray pattern at a highly uniform degree of atomization is reported by Spraying Systems Co., Chicago. It is designed for



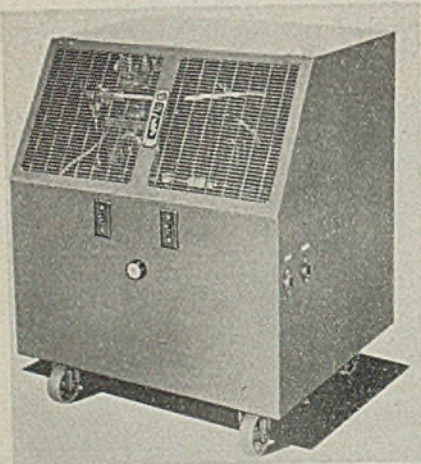
use in gas washers and related process applications and is suitable to handle water and other liquids of similar viscosity.

The concentrated narrow-cone spray of the unit provides a high degree of impact for any given pressure. The unit is offered in brass, steel, monel metal and stainless steel, all with removable internal vanes. It is being made in a wide range of sizes, each having definite performance characteristics.

Fluid Cooler

A new industrial fluid refrigerating system, model 400, which mechanically refrigerates fluids, settles and screens out chips and coarser abrasives, and applies the coolant or fluid to the work through a self-contained pump, has been built by the Gray-Mills Co., Chicago. It is adaptable to the cooling and temperature maintenance of many industrial fluids, with special emphasis on coolants for metal cutting, hydraulic oil applications, maintenance of submerged bearing temperatures, quenching oils, spot welders and laboratory setups.

The unit has a 1-horsepower compressor rated at 11,800 B.t.u.'s. Centrifugal or gear-type coolant pumps op-



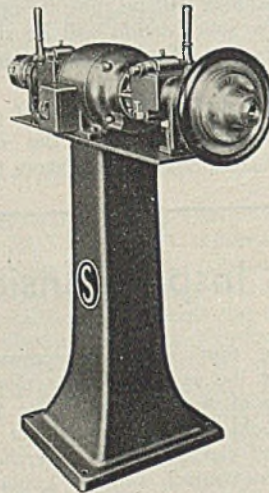
erated by a ½-horsepower motor are optional. The centrifugal unit has a rated capacity of 3000 gallons per hour (water at no head) at 7 pounds pressure, and the gear pump is rated at 180 gallons per hour at 50 pounds pressure. The cooling tank with a capacity of 35 gallons is equipped with removable 45-de-

gree settling and filtering screens of various meshes, and baffle plate for removing chips and the coarser abrasives.

Model 400 occupies 28½ x 33 inches floor space and stands 44 inches high. It refrigerates mechanically, no water or water connections are required. Completely portable, it can be put into operation by simply plugging in to the power line.

Two-Operator Lathe

Double-end construction of the new speed lathe manufactured by Standard Electrical Tool Co., Dept. C-10, 2489 Riner road, Cincinnati, permits two operators to work at the machine at the same time. Each operator is independent of the other as the machine is equipped with a combination clutch and brake that permits either side of machine to be con-



trolled independently. The motor also is individually controlled.

Illustration shows the right end of machine equipped with Sjogren collet chuck, while the lefthand side is furnished with a 4-inch universal lathe chuck. The lathe is being offered as a single-end machine in sizes of ½, 1 and 2 horsepower, with any spindle speeds between 50 to 3450 revolutions per minute. The machine is also furnished in a bench model with foot-pedal control.

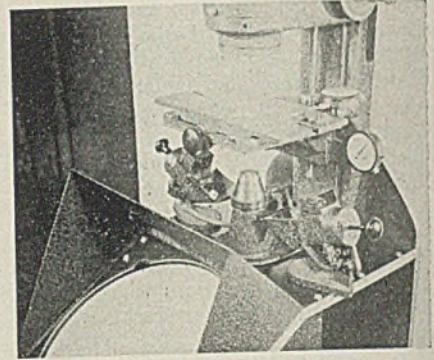
Optical Comparator

A new optical comparator, known as model P2-14, has recently been placed on the market by Portman Machine Tool Co., 70 Mill road, New Rochelle, N. Y. The co-ordinate stage of this comparator, as illustrated, is larger than on previous models. This results in greater mechanical capacity. Also, new type dial indicators, having larger dial faces, are now used giving increased precision measurement control.

Another feature is the new "Shaft-of-Light" blower cooled lamp housing which includes a new type of condenser lens unit of larger size, mounted as an

eccentric assembly within the housing. Provision is made for sensitive light beam adjustment under all operating conditions.

The comparator also may be obtained with a plain work stage unit for use



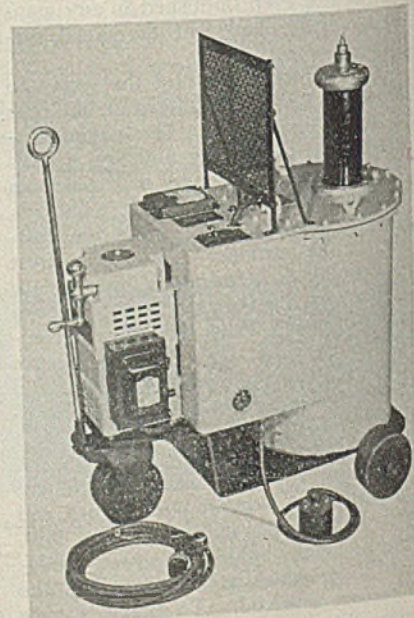
on production jobs or where co-ordinate measurements are not required. Magnification lens units of 10X, 20X, 31¼X, 50X, 62½X and 100X are obtainable as standard equipment. The comparator weighs approximately 400 pounds, has an overall height of 60 inches, and occupies a floor space 24 x 30 inches. It is furnished with a 14½-inch diameter image screen.

Extra accessory equipment available includes surface illuminator attachments and two types of center stages.

Portable Test Set

A newly designed 50,000-volt portable test set for use on single-phase, 115 or 230-volt, 50 or 60-cycle circuits is announced by General Electric Co., Schenectady, N. Y. It can be used in cable factories, industrial plants, central stations, laboratories and wherever high potentials up to 50,000 volts are required for testing electric apparatus or insulating materials.

It combines in a compact unit an oil-insulated testing set, a highly accurate indicating voltmeter, a voltmeter selector



(All claims are those of the manufacturer of the equipment being described.)

MAKING *a bigger* *days work Possible*

Fatigue takes toll of production. When machinery is tiring to operate, the output curve slides toward the end of the day. Northwest engineers recognized this a long time ago and built Northwest cranes accordingly. One of Northwest's many exclusive features, the "feather-touch" clutch control takes the back breaking effort out of throwing the heavy drum clutches and makes operation smooth and easy.

The "feather-touch" control is simple. There are no delicate adjustments, no high pressure piping, nothing to leak, nothing to refill. The "feather-touch" control is unaffected by the weather. There can be no shut down due to the failure of controls and because the operator always retains the feel of the load, greater safety is combined with smoothness of operation.

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NORTHWEST

The Crane that goes Anywhere!

STEEL— a measure of freedom

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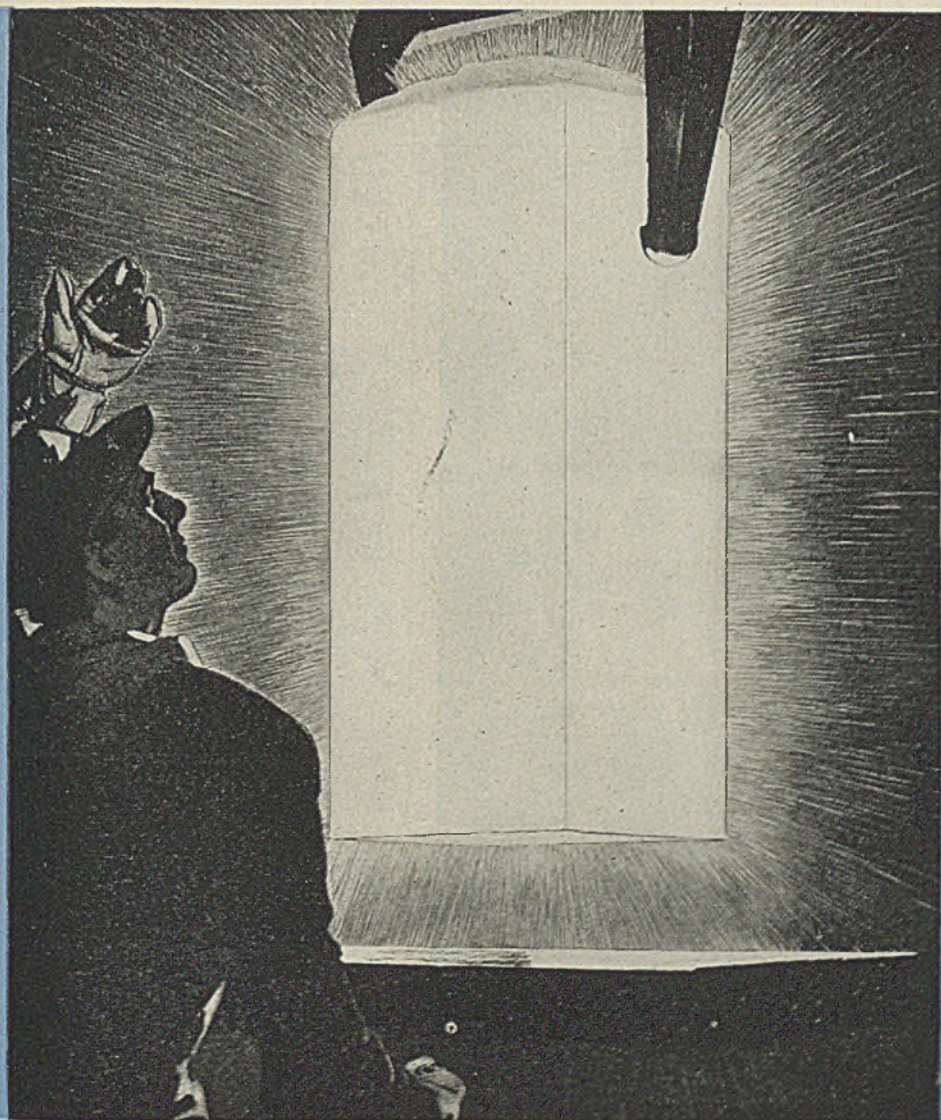
In the time of the Revolution, our colonial furnaces produced 30,000 tons of iron a year. Out of this tonnage, General Washington armed his troops and won our freedom.

★ ★ ★

In this war of the world . . . America is producing more than 90 million tons of steel ingots a year—more than all of the rest of the world combined—with virtually every ton going into fighting steels for our fighting men.

★ ★ ★

Such is the measure of the growth of our iron and steel industry in the years of our Republic. And the very growth of our country has been written in the fiery chapters of steel's expansion . . . for it is steel that built our industries, our railroads, our highways, our towns and cities, and knit this continent into a community by the development of our rich resources. So we have enjoyed our freedom . . . and by enterprise, ingenuity, science, and skill created a way of life and living that is American.



FROM AN ORIGINAL DRAWING BY ORISON MACPHERSON

Holding fast to this freedom—securing it anew for the brave, new era that lies ahead for America—is now the measure of steel's productivity in overwhelming quantity as it serves directly on all fronts and helps to marshal other materials and metals for military duty.

★ ★ ★

First of our fighting metals . . . steel is likewise the strongest, most serviceable, adaptable metal for the peaceful arts. It is in this role that steel looks to the future, for this war that has sharpened steel's fighting tools has also put a keen edge on its ambition and ability to create new things for a new world of peace and progress and prosperity.

★ ★ ★

With steel we measure our freedom . . . secure it . . . defend it . . . share it with all mankind.

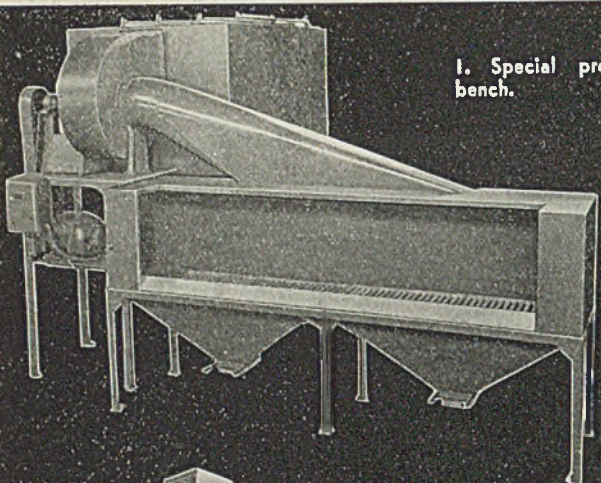
JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

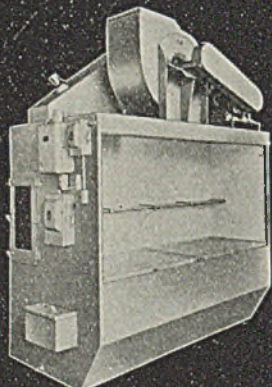


CONTROLLED QUALITY STEEL FOR WAR

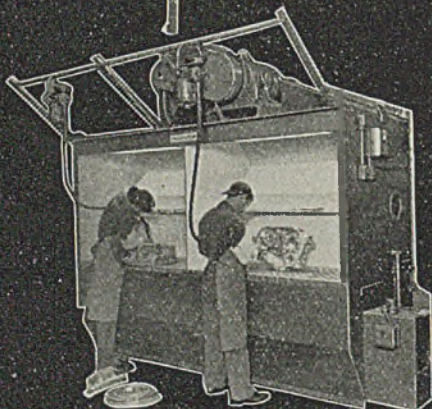
Industrial scrap helps win the war...keep your scrap moving to the steel mills.



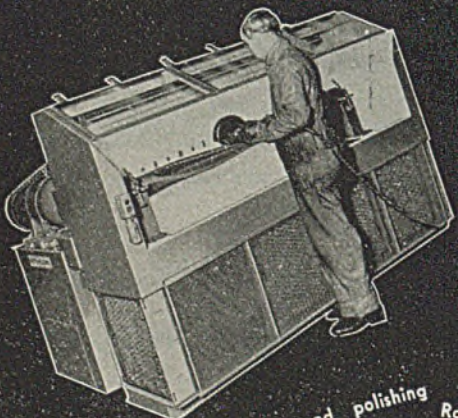
1. Special propeller blade grinding bench.



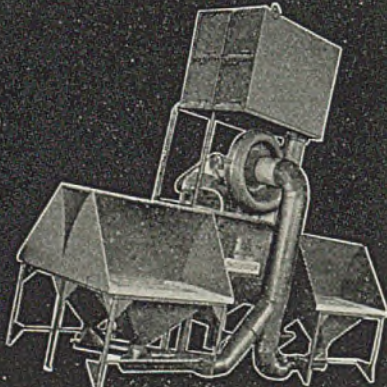
2 Roto-Clone Type N grinding bench for large magnesium castings.



3 Booth type bench for magnesium casting finishing.



4 Propeller blade grinding and polishing bench with filter after-cleaner.



5 Group of four benches served by single Roto-Clone unit with after-cleaner for small parts burring.



ROTO-CLONE

Dust Control

GRINDING BENCHES SPEED PRODUCTION

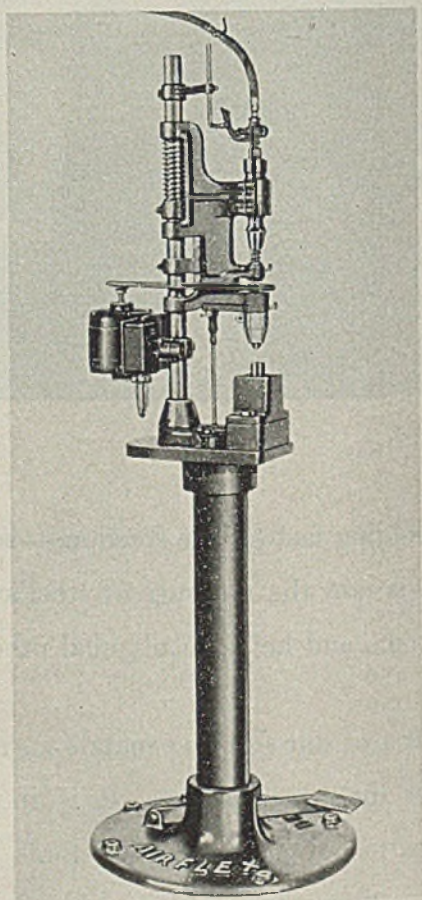
Shown on this page are some of the special AAF Roto-Clone grinding benches designed to meet specific needs in war production plants. Complete information on each will be sent on request.

AMERICAN AIR FILTER COMPANY, INC.
 443 Central Avenue INCORPORATED Louisville, Ky.
 In Canada: Darling Bros., Ltd., Montreal, P. Q.

switch, and complete control equipment, such as air circuit breaker, line switch, foot switch and induction voltage regulator. A screened safety guard separates the operator and the high-voltage bushing, a red light warning the operator whenever the set is energized. A large dial and the indicating voltmeter show the applied test voltage in kilovolts. For greater accuracy, the meter is equipped with a double scale—one for values up to 25 kilovolts and the other for values from 25 to 50 kilovolts. The 3-wheel truck on which the set is mounted is provided with roller-bearing mounted wheels, and a ball-bearing mounted swivel joint for the front wheel.

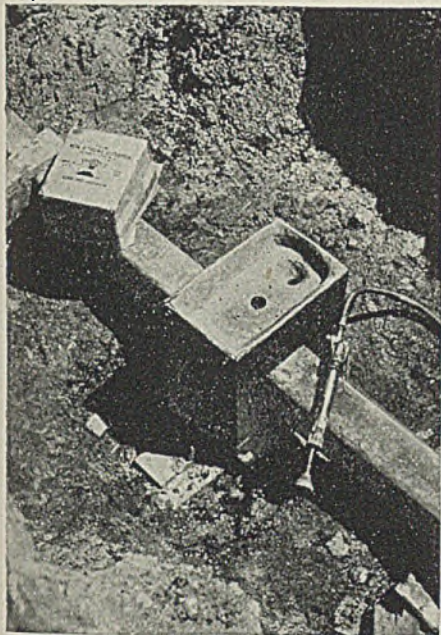
Advance Pressure Pad for Riveters

An advance pressure pad is included in the latest model riveters offered by Airflex Equipment Co., 13255 Birwood, Detroit. It consists of an aluminum housing, spring and pilot with the pilot

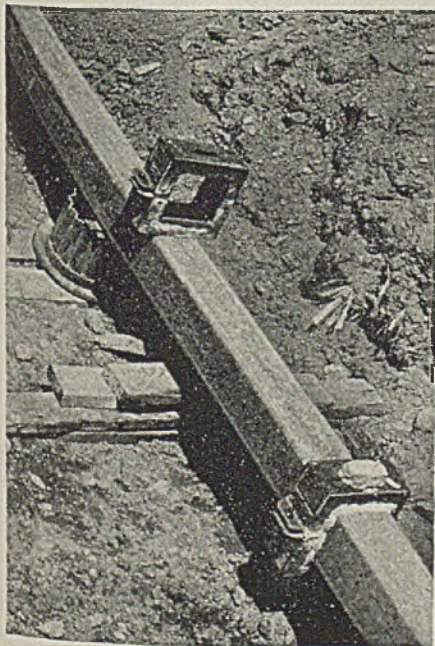


forerunning the peening tool to hold the assembly rigidly against the rivet set. The Airflex spinner riveter makes round, oval, flat head rivets—peens shafts, pins and studs—furls or swages shoulder bushings and light tubes to sheet metal or plastics. While rotating, the machine delivers these short, 3/4-inch maximum, strokes in rapid succession from an air-operated peening tool. A 1/2-horsepower vertical motor with push-button control is used for the rotating

STEEL TIE RODS THERMIT WELDED TO SPEED CONSTRUCTION OF ORE DOCK



Pre-fabricated mold boxes were used, thus eliminating the usual hand forming of patterns.



A completed wax pattern for one of the 222 welds employed. Wooden pattern in background.

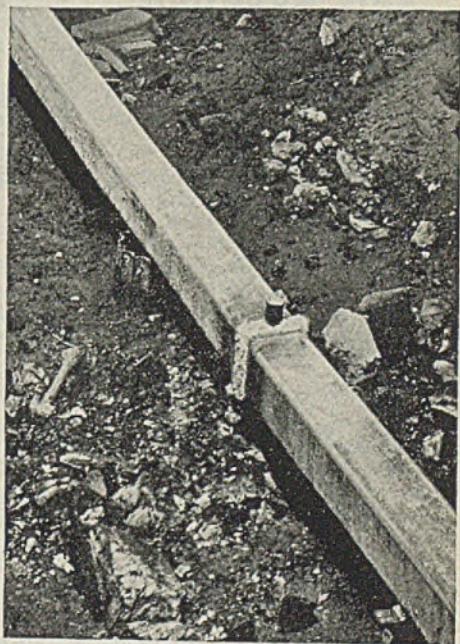
Speed and strength were among the advantages gained by a large steel producer through the use of Thermanit welding to fabricate tie rods used in building a new ore dock. Placed at 20-foot intervals beneath the floor to prevent the concrete retaining walls from spreading, the tie rods were constructed from seven-inch square steel billets, each 46 feet long. The six Thermanit welds required for each tie were completed in one day by a five-man crew. Normal Thermanit welding practice was followed except that wooden molds were employed for making the wax patterns. Since all the welds were of the same dimensions, the necessity for forming each pattern by hand was eliminated.

Both in the fabrication and repair of heavy parts, Thermanit welding is helping wartime industry. Total welding time is often a small fraction of that required for replacement or the use of other methods, welds are equal in strength to a steel forging, and stress relieving is unnecessary.

For a complete description of the Thermanit welding process, write for the booklet "Thermanit Welding."



Pouring the molten Thermanit. A five-man crew completed six Thermanit welds daily.



The finished weld.

METAL & THERMIT CORPORATION



Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermanit for repair and fabrication of heavy parts.

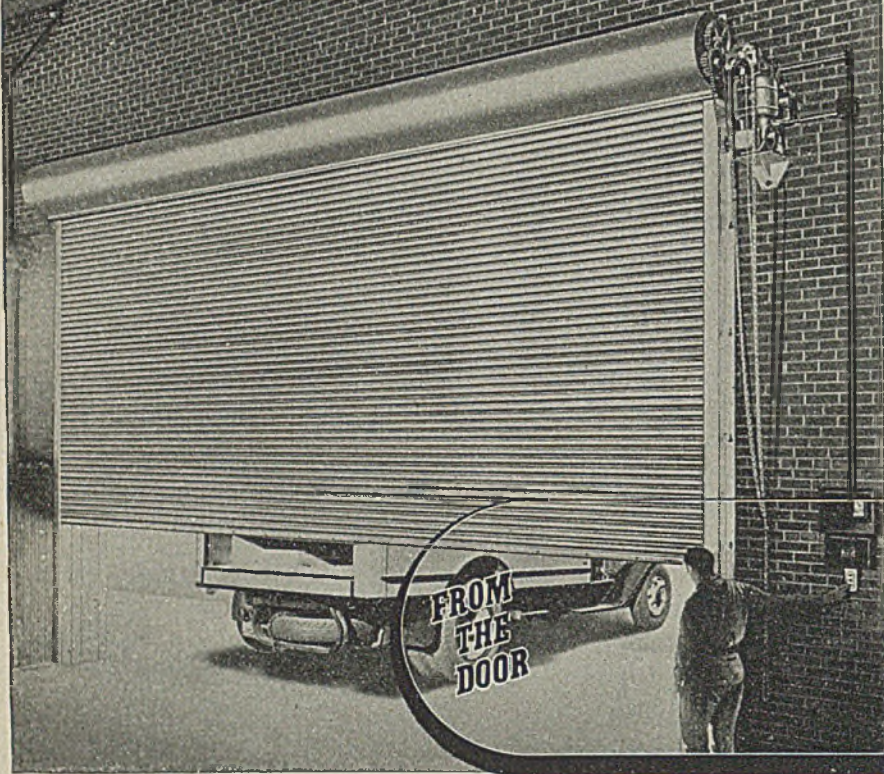


120 BROADWAY, NEW YORK 5

ALBANY · CHICAGO · PITTSBURGH

SO. SAN FRANCISCO · TORONTO

KINNEAR Motor Operated ROLLING DOORS

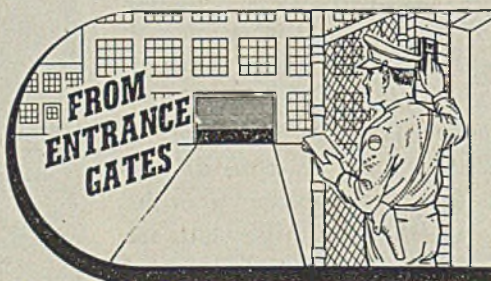
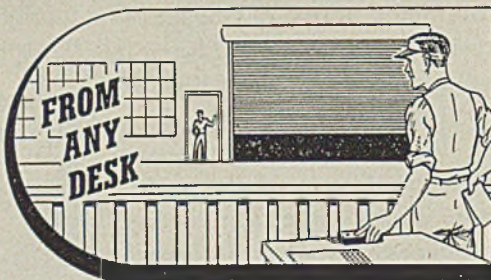


Controlled from Any Location

You save time and work with doors you can open from remote stations! Quick opening and closing cuts heat losses in winter, too.

In addition to remote control, Kinnear Rolling Doors give you extra value in other ways. By coiling compactly above the doorway, they permit full use at all times of all space around openings . . . leave ceilings clear for conveyors . . . avoid blocking off light from nearby lights or windows . . . open out of the way and out of reach of damage. Their strong, durable construction affords valuable protection against intrusion, sabotage, and the elements. Easy to install in old or new buildings. Write today for catalog.

FOR WARTIME NEEDS, Kinnear WOOD Rolling Doors, with motor or manual control, are still available. These time-improved doors save vital war metals! The Kinnear Mfg. Co., 1780-1800 Fields Ave., Columbus 16, Ohio.



**SAVING WAYS
IN DOORWAYS**

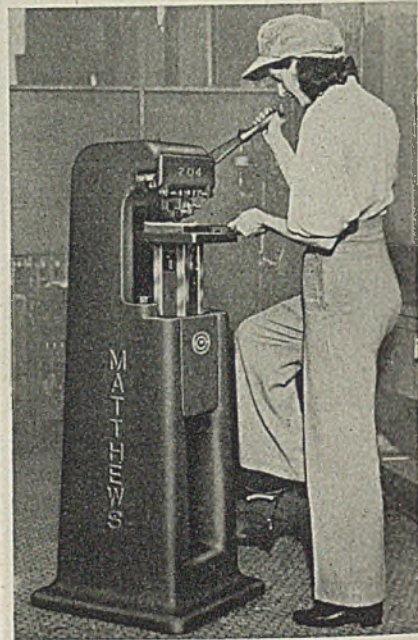
**KINNEAR
ROLLING DOORS**

motion while air is regulated from a petcock to adjust the force and frequency of the blows.

Frame travel of the riveter is approximately 2 inches, and the throat depth is 5 inches. Frame adjustment on the post is 4 inches to accommodate various sizes of assemblies. The riveter is being made in three models—SP-75, 5/32-inch capacity, SP-100, 1/4-inch capacity and SP 5/16-inch capacity.

Marking Machine

Part numbers, names, coding, trademarks, special lettering or design, etc., can be marked on parts up to 6 inches in diameter or thickness with the No. 204 general purpose hand-operated marking machine introduced by Jas. H. Matthews & Co., New York. The machine marks



flat parts by means of solid or mortised roller dies and interchangeable segment type. Round parts are marked with flat dies or interchangeable steel type.

The part to be marked is placed into a fixture fastened to the table of the machine. A foot treadle is used to raise the table, bringing the part into contact with the marking die. Downward action of the handle causes the die to move across the part, legibly rolling in the mark.

Overall height of the machine is 52 inches. It has a die stroke on round parts of 3 1/2 inches—on flat parts 4 1/2 inches. Its table measures 9 x 8 inches. Throat of the machine from center of die to front of uprights is 3 1/2 inches.

Wind-Up Machine

Wire, cable, cord, rope, paper, tapes of various kinds, textiles and coated fabrics can be wound up on a new wind-up machine introduced by Industrial Oven Engineering Co., 11621 Detroit avenue, Cleveland. It is a complete, self-contained unit with combination variable speed and hydraulic syn-

He Can Do These Jobs in 20 to 42 Seconds!



WITH HIS OSTER "RAPIDUCTION JUNIOR" NO. 572

*Chuck Pipe... Thread Pipe
Ream & Chamfer... Cut Off*

AVERAGE TIME IN SECONDS

Pipe Size	Chuck	Thread	Ream and Chamfer	Cut Off	Total Floor to Floor
1/4"	10	4	4	2	20
3/8"	10	6	4	2	22
1/2"	10	6	4	2	22
3/4"	10	8	4	3	25
1"	10	11	5	5	31
1 1/4"	10	11	5	5	31
1 1/2"	10	17	6	8	41
2"	10	17	6	9	42


The operator of an Oster No. 572 "RAPIDUCTION JUNIOR" is prepared to "turn on the speed" for accurate threading of pipe from 1/4" to 2"; and bolts from 5/16" to 1 1/4" N. C. or Whitworth; and 5/16" to 1 1/2" N. F. or B. S. F.

And note this: The close-gripping, universal, three jaw, bar operated, quick-acting FRONT CHUCK on the No. 572 machine makes it easy to thread nipples as short as 3 1/2" in the 2" size on both ends without using a nipple chuck; and pipe or studs as short as 2 1/2" can be held and threaded on one end. (Other sizes in proportionately short

lengths can be held and threaded in record time.)

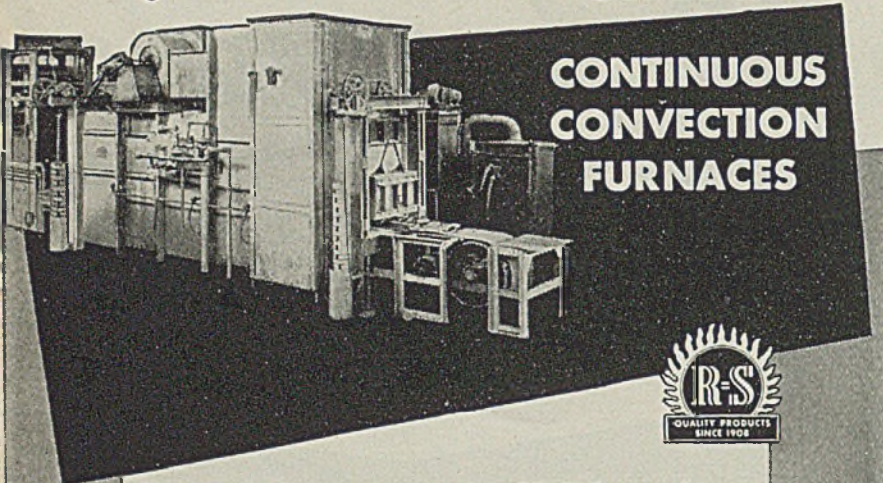
Other features contributing to the speed of this machine include the quick-opening, fixed die-head (or the optional *quick-opening*, individual, *quick-change* die-heads and dies.

For general purpose, or long run production threading, the Oster No. 572 "RAPIDUCTION JUNIOR" combines low initial cost, low operating and maintenance costs, and high production at rock-bottom unit costs. Write for Catalog No. 25-A.

OSTER for faster, better threading 

THE OSTER MANUFACTURING COMPANY, 2037 EAST 61st ST., CLEVELAND 3, OHIO, U. S. A.

Capitalize on R-S



CONTINUOUS CONVECTION FURNACES



A TYPICAL example of R-S thoroughness in adapting a type of furnace to a particular heat-treating job is the continuous convection, gas-fired furnace illustrated above. Frankly, we are not permitted to divulge full details. Suffice it to say that the production results substantiate our claims of exceptionally uniform and close temperature control (400 to 1300°F.), general over-all efficiency, automatic operation and minimum labor to load and unload. Parts are loaded on the wire mesh belt which moves at a constant, set speed, variable at will.

From the viewpoints of delivery, efficiency in operation and reliability, the R-S Furnace record is truly outstanding. It justifies the use of the expression "Furnaces of Distinction."

FURNACE DIVISION

R-S Products Corporation

122 Berkley Street • Philadelphia, 44, Penna.

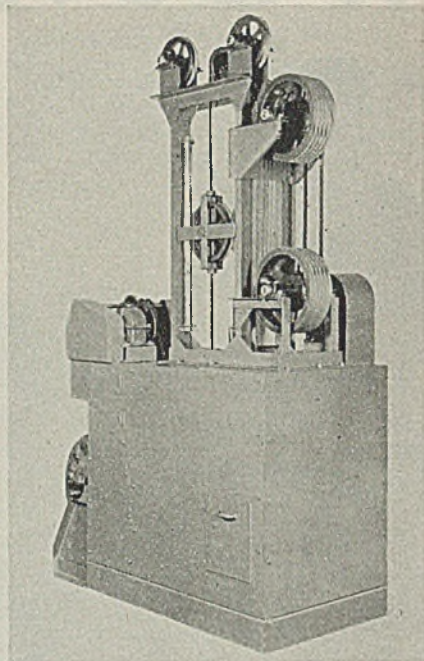
FORGING • PLATE AND ANGLE HEATING • CAR HEARTH
METAL MELTING • CONVECTION • ROTARY HEARTH
ANNEALING • CONTINUOUS CONVEYOR • SALT BATH

R-S Furnaces of Distinction

BUY WAR BONDS

chronizing equipment, designed to provide constant speed and constant tension within a variable production range. By arrangement of adjustable counterweights of the machine, wire tension can be varied from a few ounces to hundreds of pounds.

The machine comprises a dismountable reel stand, multi-wrap large-diameter capstans, constant but variable-



tension mechanism and an adjustable level winder. It also is equipped with provisions for driving assisting capstans which are required on some grades of fine wire. The machine is motor driven and requires no outside source of power or synchronization.

Gear-Shaving Machine

Shaving of fine-pitch gears up to 4 inches pitch diameter and 20 diametral pitch and finer is the function of the new No. 4 fine-pitch gear shaving machine introduced recently by Fellows Gear Shaper Co., Springfield, Vt. For the work, the machine employs a rotary type shaving tool. The work is held on fixed centers located in adjustable head and tail stocks. The slide carrying the work-table, head and tail stocks is reciprocated by a crank mechanism, which slowly traverses the work across the shaving tool. The work-table is adjustably mounted on the slide for correcting taper.

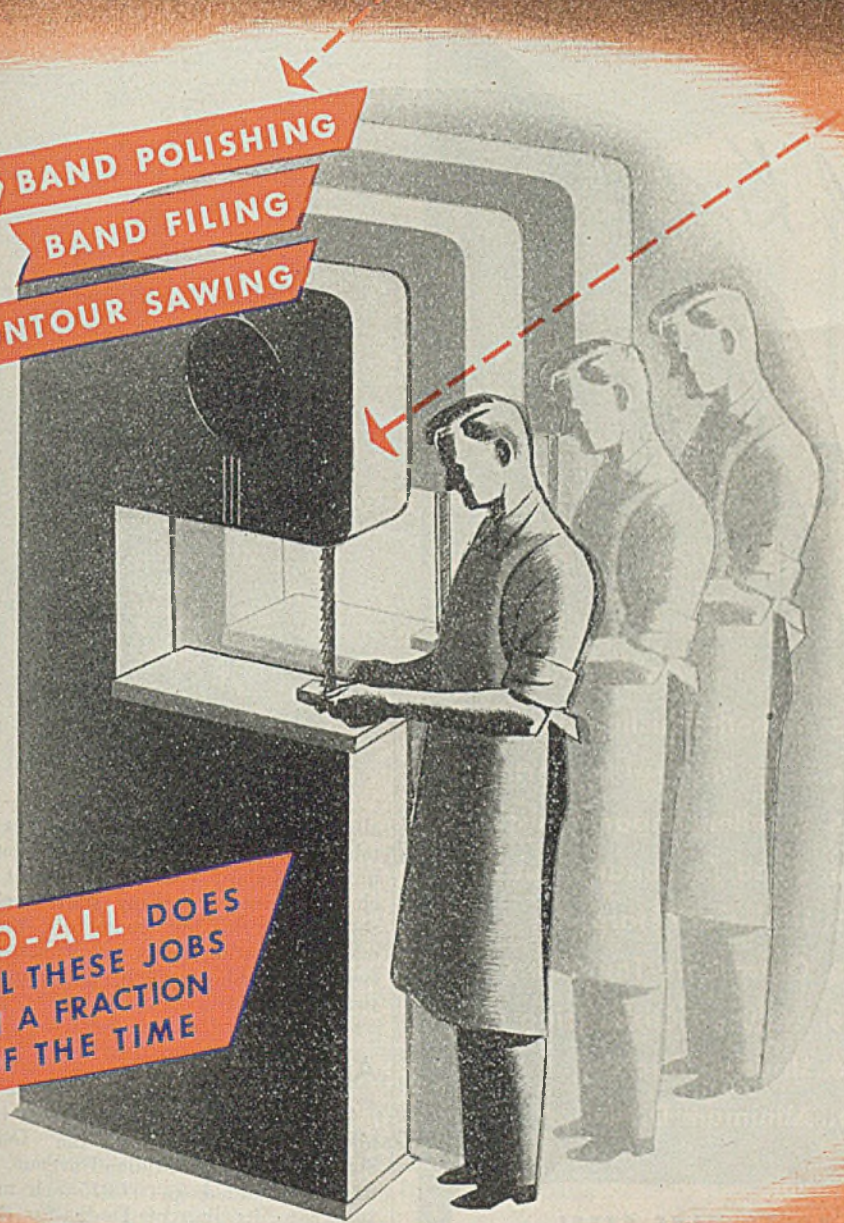
The head carrying the shaving tool is adjustable for crossed-axes setting having a maximum angular movement of 20 degrees, both sides of center. A scale for degrees, and a vernier for minutes is provided for angular setting of the tool head. Provision also is made for using a dial indicator for finer settings.

In operation, the tool is fed into the work by means of a depth feed cam, and a crank-handle on the depth-feed shaft is used for setting up. The tool spindle is driven by a separate motor mounted in

DO-ALL 3 MACHINES IN 1

BAND POLISHING
BAND FILING
CONTOUR SAWING

DO-ALL DOES ALL THESE JOBS IN A FRACTION OF THE TIME

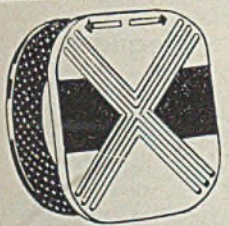


SAWS. Cuts shapes in metals, alloys, plastics, plymetals, etc. Does internal or external cutting — follows any design, straight or curved line, through thick or thin sections, with no waste excepting a very fine kerf dust.

FILES. Replace the band saw with a DO-ALL Band File and you're all set for rapid, clean filing that will amaze even experts.

POLISHES. The same machine accommodates DO-ALL Polishing Bands that put a fine finish on any product in double-quick time.

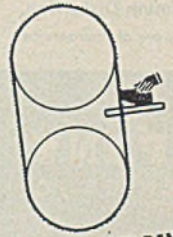
Every shop needs contour sawing and with it band filing and polishing — all possible with these new, time-saving machine tools. Six models priced from \$1,000 to \$5,000 with motors.



DO-ALL BAND SAWS
 100 feet in a special metal Strip-out Container marked with size and style of contents.



DO-ALL BAND FILES
 Available in different lengths to fit the model DO-ALL you own. Each in compact box.



DO-ALL POLISHING BANDS
 Lengths to fit any DO-ALL Contour Machine. Available in three grits, 50, 80 and 150.

CONTINENTAL MACHINES, Inc

1324 S. Washington Ave., Minneapolis 4, Minn.

DO-ALL Offices in 25 cities, with a staff of trained engineers to give you quick service on Contour Machines, Band Saws and Files, Gage Blocks and Surface Grinders

WOULD YOU LIKE A CONTOUR SAWING BOOK?

Send for a copy of this 265-page book of illustrated short cuts to faster and better machining. It's free.

SPEED CASE STEEL

A LOW CARBON OPEN HEARTH PRODUCT

A Steel Knot

ONE STEEL

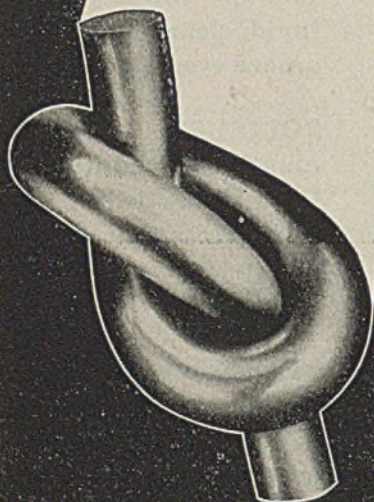
that gives you . .

1. High Speed Machining
2. Greatly Increased Tool Life
3. Smooth Finished Parts
4. High Physical Properties
5. Excellent Impact Resistance
6. Good Torsional Values
7. High Case Hardness
8. Great Core Toughness
9. Reduced Carburizing Time
10. Unusual Ductility
11. Minimum Distortion

SPEED CASE STEEL . . .

CARBURIZES in less time with
High Case Hardness . . . Core
Toughness and Minimum Distortion.

WRITE US! Our metallurgists are at your service.



ACTUAL PHOTOGRAPH
Speed Case Steel (.20
carbon) 1-inch cold
drawn bar tied in a knot,
cold, without fracture.

BUY WAR BONDS

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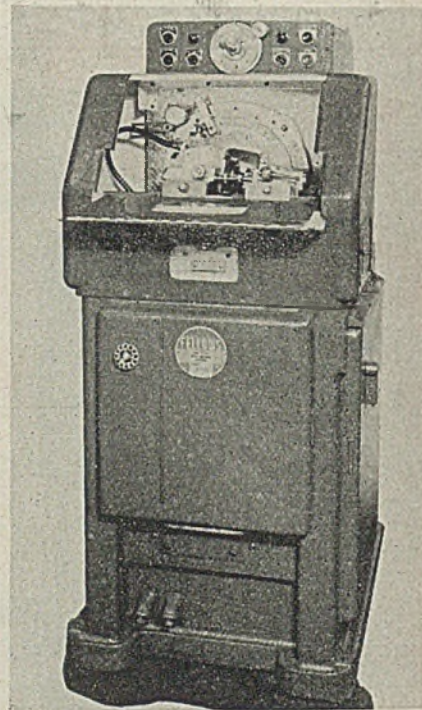
Licensee for Eastern States

THE FITZSIMONS COMPANY

YOUNGSTOWN, OHIO

the feed slide. The motor which drives the work slide also operates the compound pump and is provided with a plugging switch to prevent coasting.

The machine is arranged for complete electrical control. The main motor, which operates the reciprocation of the slide, and the other functions of the machine outside of the shaving tool, is a 1/6-horsepower, alternating current, 57 revolutions per minute, geared motor. Tool rotation motor is a 1/3-horsepower,



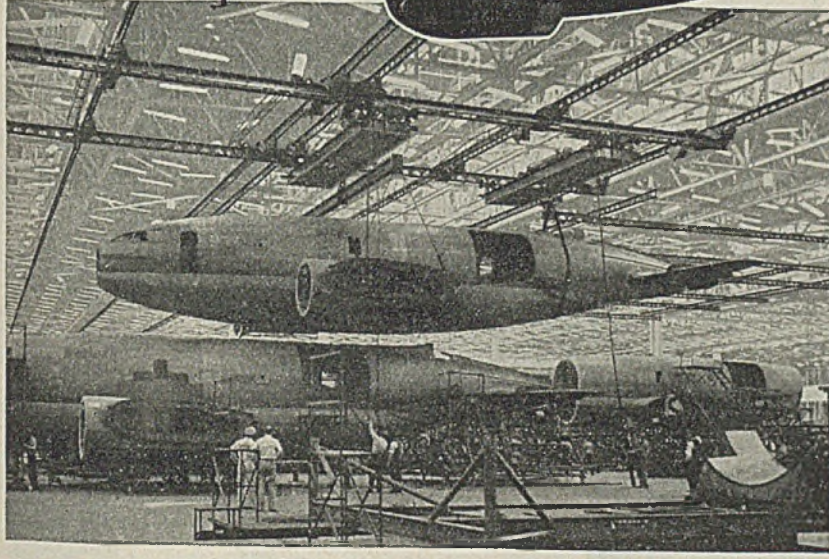
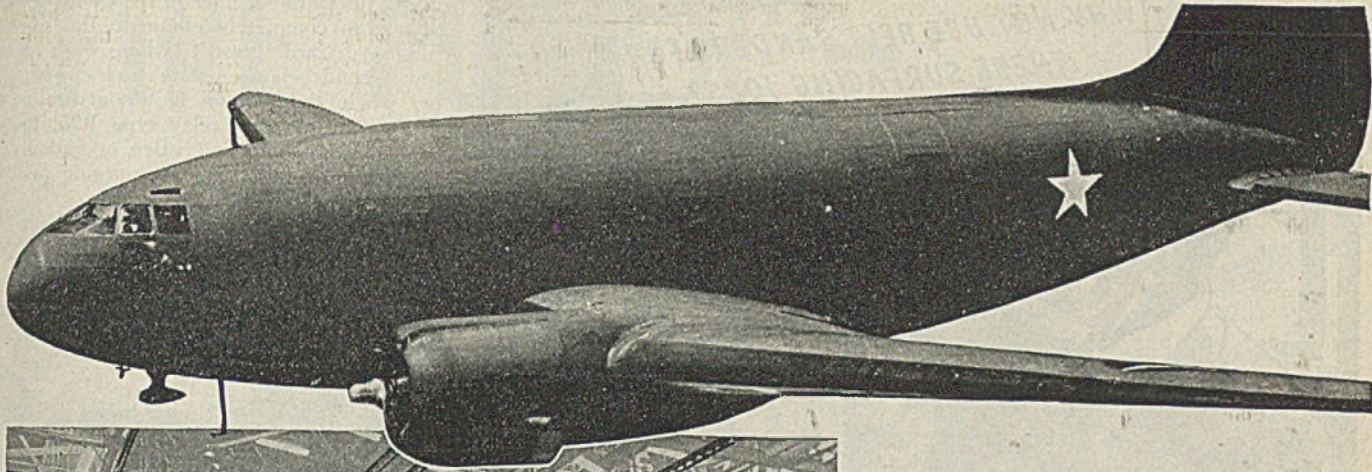
alternating current, 1200 revolutions per minute, totally enclosed, ball bearing unit. Standard control equipment includes: Motor reversing starter, motor starter, interlocking contactors, timing relays, indicating lamp receptacles, cam switch, reversing switch, and plugging switch.

Arbor Spacers

To meet present day demands for close tolerance milling jobs, the Detroit Stamping Co., 359 Midland avenue, Detroit, has added an 0.0015-inch metal spacer to its line of De-Sta-Co arbor spacers. This new spacer permits the setting of milling machine cutters down to as fine as 0.0005-inch spacing. Various sizes are available to fit all standard arbors.

Flame Failure Safeguard

A photoelectric system, known as Fireye Type F28C, which provides instantaneous fuel cut-off in any pressured burner in the event of flame failure, is announced by Combustion Control Corp., Cambridge, Mass. Capable of monitoring flame of any intensity, the system is applicable to oil, gas or pulverized coal burners and operates entirely from direct observation of the flame



FIRST TIME UP

Big C-46 Transports Go Up First on Cleveland Tramrail

The hundreds of giant C-46 Curtiss Commando Air Transports being turned out in a New York State plant of the airplane Division of Curtiss-Wright Corporation, get their first boost upwards with the new 10-ton Cleveland Tramrail transfer bridge system.

In fact they get several rides during construction. The various fuselage sections, wings, engines, and other parts are brought together by means of the bridges which may be interlocked, enabling the transfer of loads from one bridge to another.

Cleveland Tramrail is playing a major role in speeding production of these famous

"Streamlined Flying Freighters." The vast area of the entire assembly floor is completely covered with Cleveland Tramrail equipment.

Curtiss-Wright engineers are proud of their Cleveland Tramrail installation. Especially pleasing to them is the heavy construction and precision workmanship of Cleveland Tramrail which makes the equipment practically trouble-proof and smooth operating.

All Curtiss-Wright plants and many other leading aircraft factories are served by Cleveland Tramrail.



GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1125 EAST 283RD ST. WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL

OVERHEAD MATERIALS HANDLING EQUIPMENT



**FASTER
THAN
MILLERS, SHAPERS, WHEN
EQUIPPED WITH ~~SILVER STREAK~~
METAL WORKING CLOTH BELTS**

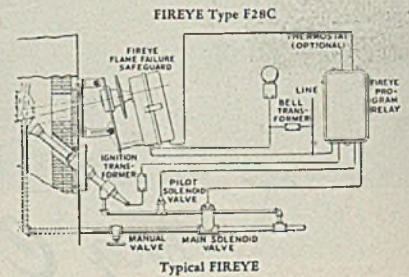
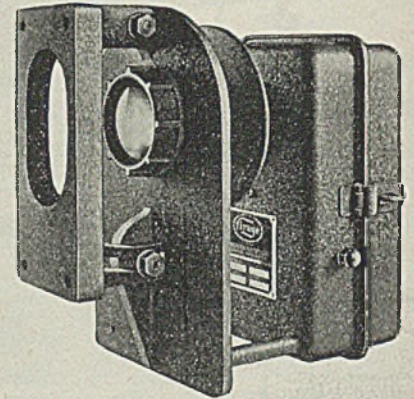
Not only do many plants find that belt sanders equipped with *Silver Streak* Metal Working Cloth Belts turn out surfacing jobs up to 50% faster, but they also find they're just as accurate, too. They maintain tolerances as fine as .0005 with no trouble at all.

Make the switch to sanders equipped with *Silver Streak* Belts. *Silver Streak* Belts are insulated to withstand grinding heats up to 1700°— and, as a result, they cut uniformly, accurately, long after ordinary belts have quit. Try them! See if they don't help you speed up surfacing jobs, and eliminate jams around your big milling and surfacing machines. Abrasive Products, Inc., 511 Pearl Street, South Braintree, Massachusetts.

ABRASIVE PRODUCTS
 SOUTH BRAINTREE MASSACHUSETTS
 JEWELOX • JEWEL EMERY • JEWEL GARNET INC. JEWELITE • JEWEL FLINT • NEW PROCESS

itself. Because of this it reacts immediately to completely eliminate the explosion hazard present when even a few seconds elapse before fuel cut-off; or, when the burner is automatically fired, with program relay type R25, to control fuel pump and valve operation, intermittent ignition system, purging period, and recycling.

Designed to operate at relatively high ambient temperatures, it is mounted directly on the furnace wall and watches the flame through a window in the wall of the fire chamber. Once the lens



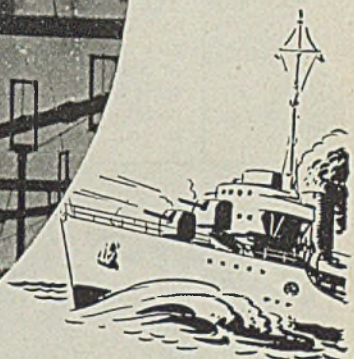
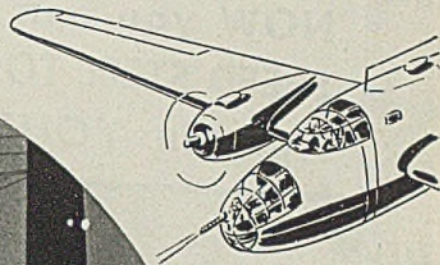
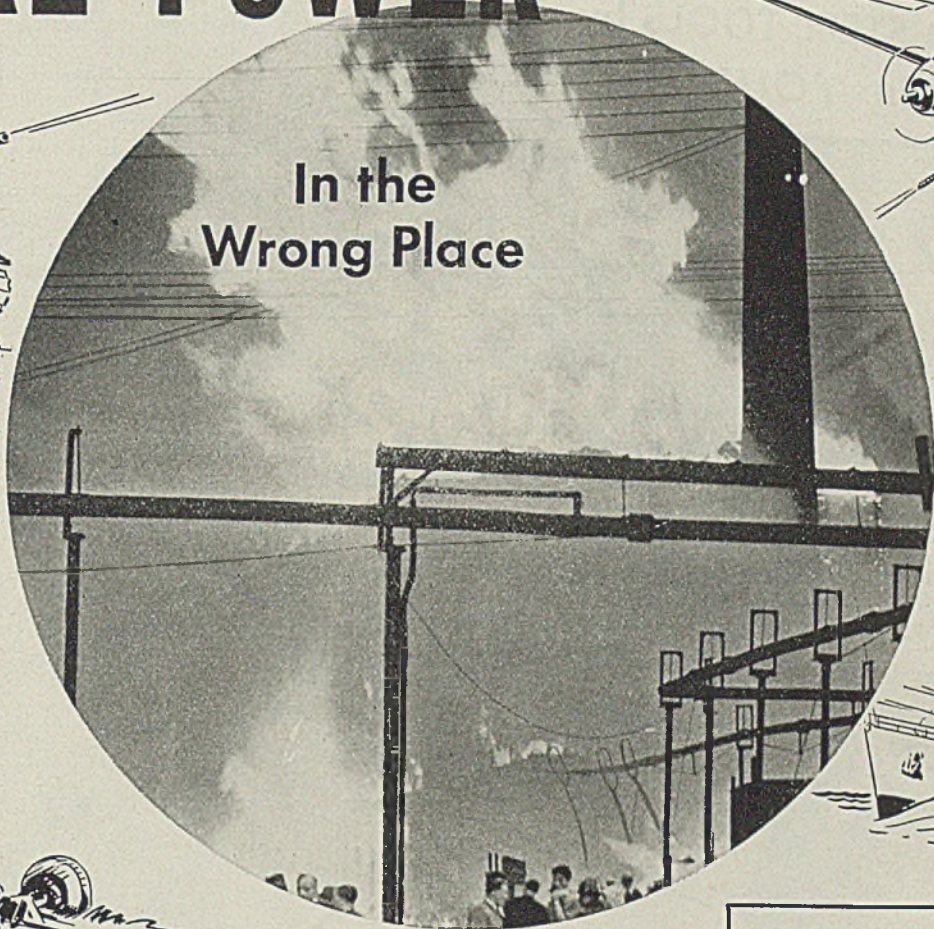
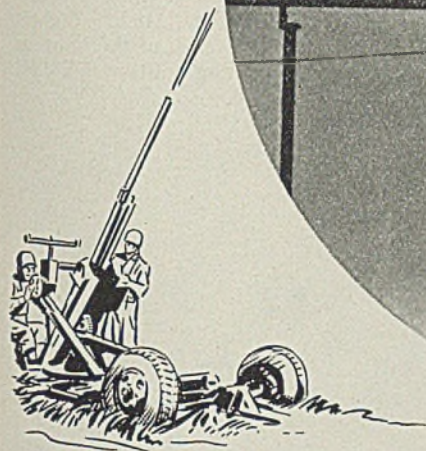
Installation For Automatically Ignited Oil Burner

of the optical system has been aligned, the field of vision of the electric eye is limited to the flame itself and extraneous light is rejected. Light from the flame strikes the sensitive plate of the photocell and starts a flow of electrons, producing a minute electrical current. After passing through a vacuum tube, this current is amplified sufficiently to operate a relay which directly controls a solenoid valve governing fuel feed, or relay which programs the entire cycle of burner operation. While the electric eye sees flame, Fireye feeds fuel to the burner. Should flame fail, or any condition impairing safe operation develop within the electronic control, Fireye cuts off the fuel supply until proper combustion conditions are restored.

Self-Priming Pump

An improved automatically controlled valve is a distinctive feature of the new type AO self-priming pump announced by Allis-Chalmers Mfg. Co., Milwaukee. Priming of the pump is accomplished as the motion of the water through the pump runner and the volute passage carries behind it a slug of air, drawing air in the suction passage through the impeller and out through the priming chamber. This hydraulic action lifts the col-

"FIRE POWER"—



In the
Wrong Place

IS A LIABILITY

"Fire Power" is a two-edged force. Applied by our weapons of war, it is driving the enemy nearer and nearer to complete defeat. Generated by combustibles in a vital war plant, "fire power" can cause crippling delays of war production in a dozen other plants.

Cardox Fire Extinguishing Systems are helping assure plenty of *effective* fire power for our fighting forces by guarding against *destructive* fire power in plants producing such critical war products as:

Airplanes, Airplane Parts, Armor Plate, Aviation Carburetors, Aviation Engines, Cold Strip Steel, Electric Power, Engine Parts, Forgings, Motor Fuel, Plastics, Processed Fabric, Rubber Products, Solvents, Tanks, Tank Engines.

An extremely wide variety of indoor and outdoor hazards—large or small—can be efficiently protected by individually engineered Cardox Fire Extinguishing Systems. By instant smothering of fire and cooling of combustibles through mass discharge of low pressure, low temperature carbon dioxide, they provide the all-important advantages of fast, com-

plete extinguishment . . . *without damage to plant and equipment by the extinguishing medium.*

Today Cardox is concentrating on (1) Fire Extinguishing Systems needed to insure more effective "fire power" for our Armed Forces; (2) plans to increase the efficiency of fire protection, both today and after the war.

If you would like more information, write on company letterhead for Bulletin 8113.

CARDOX CORPORATION BELL BUILDING • CHICAGO 1, ILLINOIS

District Offices in New York • Washington
Detroit • Cleveland • Atlanta • Pittsburgh
San Francisco • Los Angeles • Seattle

How Cardox Systems Protect War Industries

- Timed discharges, as needed, through built-in piping systems . . . supplied instantly from a single storage unit holding tons (if required) of liquid Cardox CO₂.
- Mass discharge of Cardox CO₂ "knocks out" fire, by . . .
- Reducing oxygen content of the atmosphere below the concentration necessary for combustion, and . . .
- Cooling combustibles and fire zone below ignition temperature . . .
- Extinguishing fire quickly and completely *without* damage from extinguishing medium.

CARDOX—CO₂ Systems with Enhanced Fire Extinguishing Performance

- A. Uniformity of CO₂ characteristics.
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MASS DISCHARGE OF CO₂
ENHANCED COOLING EFFECT
CENTRAL STORAGE UNIT
AMPLE CO₂ RESERVE
ENGINEERED SYSTEMS
MANUAL OR AUTOMATIC CONTROL

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NON-DAMAGING FIRE EXTINGUISHING SYSTEMS

NOW you can RECLAIM HIGH SPEED STEEL TOOLS by WELDING right in YOUR OWN PLANT!

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No. 1 AND A NEWLY DEVELOPED No. 2

The Welding Equipment & Supply Co. (originators of "SUTTONIZING", the first successful welding process for reclaiming HSS Tools) announce their recent development of SUTTONITE No. 2 Drawn Alloy Welding Rods, which with SUTTONITE No. 1 now make it possible for you to reclaim your high speed steel cutting tools by welding right in your own plant.

This announcement is of vital importance for, with SUTTONITE No. 2 the customary hazards experienced in the welding of broken HSS cutting tools has been eliminated. If you want to repair those broken tools in your plant it will pay you to wire or write for complete information today.

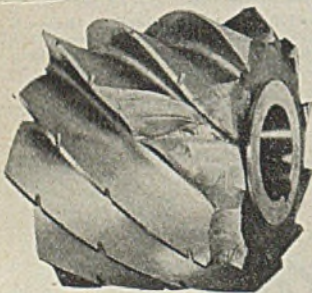


★
 Here's the booklet that tells all about SUTTONITE No. 2 and how to use it in your plant. Don't fail to send for it today!

Distributors in principal cities of the United States and Canada.

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EXAMPLES of TOOLS that can be RECLAIMED RIGHT IN YOUR OWN PLANT WITH SUTTONITE



6" x 5" x 2" slab mill with teeth fractured.

SUTTONITE No. 1 and No. 2 are used to reclaim milling cutters, broaches, drills, ball and end mills, reamers, taps, cutting tools for lathe, planer and shaper and special shape forming tools.



Same Slab mill as reclaimed by "SUTTONIZING." Also rough ground.

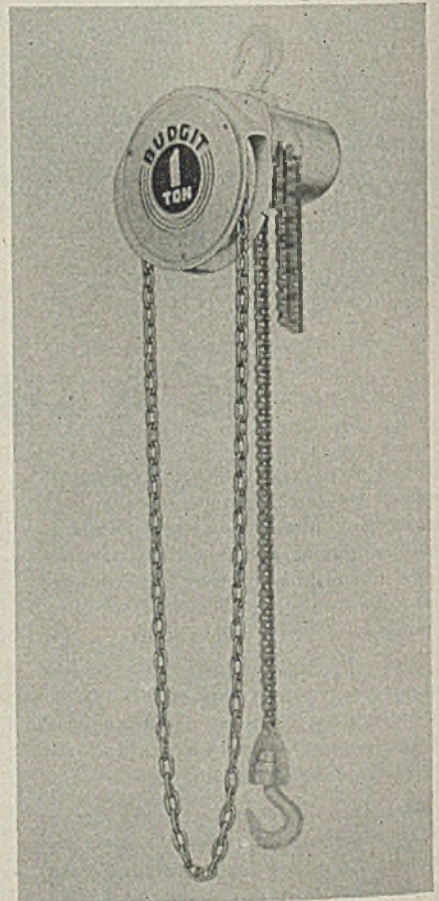
umn of water in the suction line and achieves the same results as would a separate vacuum pump.

The priming valve closes slowly during this process, acting against a spring tension which governs the rate of priming and the static height of the priming suction lift. The automatic closing of the valve after complete priming prevents water from by-passing back to the suction chamber, with resultant power loss.

The pump impeller has an unusually thick vane with rounded inlet edges, permitting the pump to pass stringy materials and fairly large solids. Available at the present time are 2 and 3-inch sizes.

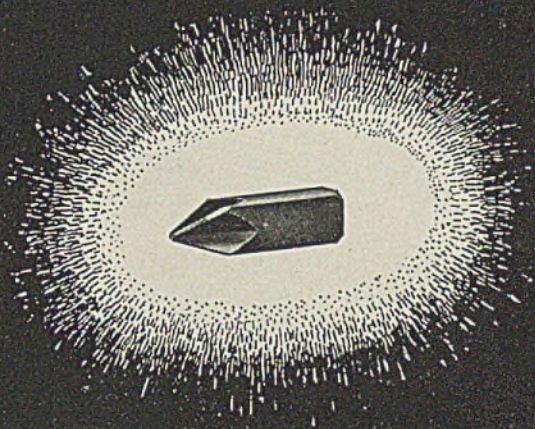
Chain Hoists

A new line of high-speed spur-gear chain hoists with 1/4 to 2 tons lifting capacities is being offered by the Budget Chain Division; Manning, Maxwell & Moore Inc., Muskegon, Mich. Light weight is a feature of each of the hoists. The 1/4 and 1/2-ton lifting hoists weigh 48



pounds, the 1-ton hoist weighs 59 pounds and the 2-ton hoist but 81 pounds.

Other features of each are: A grease-packed sealed enclosure in which the automatic load brake and the entire mechanism operate, a steel hand-chain wheel housed in a steel enclosure, chain guide which prevents the hand chain from "gagging" or fouling the wheel.



We made a smaller PHILLIPS bit do a bigger job

... and save money, steel, replacements, and handling

Apex-Phillips Service Drive Bits are shorter in length—and longer on savings and service—than ever before. By using a few standard sizes of holders and insert-type bits available in four point sizes, you make four important savings.

Once you've bought the holders you need, you carry a stock of insert tips only. One range of inserts fits various sizes of holders. The tips are small, and hence release steel for

other war uses. Float between holder and bit means less wear on the point, because tip and screw recess align easily and accurately. Lastly, return of used bits for reconditioning is unnecessary. The cost of the inserts amounts to approximately the same as reconditioning charges.

Meet the family of Apex-Phillips Service Drive Bits.



Four sizes— $\frac{1}{4}$ " hex, $\frac{5}{16}$ " hex, $\frac{1}{4}$ " square and $\frac{5}{16}$ " square, comprise the entire range of inserts with their various Phillips point sizes for our complete range of holders.

Write for Bulletin 102, describing this new (pat. pend.) type of bit and Apex holders to fit practically every make of power drive.

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New Skill, New Speed for either GREEN or OLD HANDS!



Three years of war production have strikingly demonstrated how any worker's efficiency can be speedily boosted on operations requiring exact processing conditions. The use of Foxboro Measurement and Control Instruments so simplifies such critical jobs that new-trained "green hands" can quickly swing into full production!

Even more important, is the added efficiency these production-aids give to veteran operators! Foxboro Instruments eliminate the uncertainty and detail-work formerly involved in maintaining accurate temperature, pressure or flow rate. Automatically

Operators' output gains both speed and uniformity from automatic Foxboro Temperature Controllers on textile dye-machines.



supplying exact measurements . . . furnishing graphic records wherever needed . . . often wholly replacing manual control . . . they enable workers to concentrate their skill and experience on faster, better output.

Why not boost *your* plant's output per man-hour by equipping the exacting operations with Foxboro Instruments? The Foxboro Company, 118 Neponset Avenue, Foxboro, Massachusetts, U. S. A.

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MEASUREMENT AND CONTROL SYSTEMS



A STAR IS ADDED . . .

For continued outstanding production, The Foxboro Company has won renewal of the Army-Navy "E" Award.

Welding Conditions

(Concluded from Page 138)

cannot be emphasized too greatly. Duplicate or triplicate specimens are essential. In the course of investigation, it was found that banding in the plate interferes with the Jominy test unless the axis of the Jominy bar is perpendicular to the direction of rolling.

Another qualification of these results is their limitation to the steady welding state. They do not represent starting conditions at the beginning of the weld bead on cold plate nor do they represent "tack" welds where the cooling rates are much higher. It would be a mistake, however, to insure ductility in the first inch or so of weld when these conditions would perhaps double the time and cost for the remaining 99 per cent of the weld. This is especially true since stress intensities are usually low at the beginning of a weld; also, the welding speed is low at starting especially in hand welding. Rather, it seems to the authors that a 5 minute preheating at the start of the weld, perhaps by a gasoline blowtorch using temperature crayons to govern the heating, followed by the welding conditions derived from this system, was the more practical solution.

One uncertainty present in this scheme is the selection of a notch-bend angle considered to be the minimum safe value of ductility which the parent metal may possess for a satisfactory weld. *This is a problem for the designer.* The present state of knowledge in the field certainly leaves much to be desired; but with this positive means of attack available, there is no reason why experience should not improve the situation rapidly.

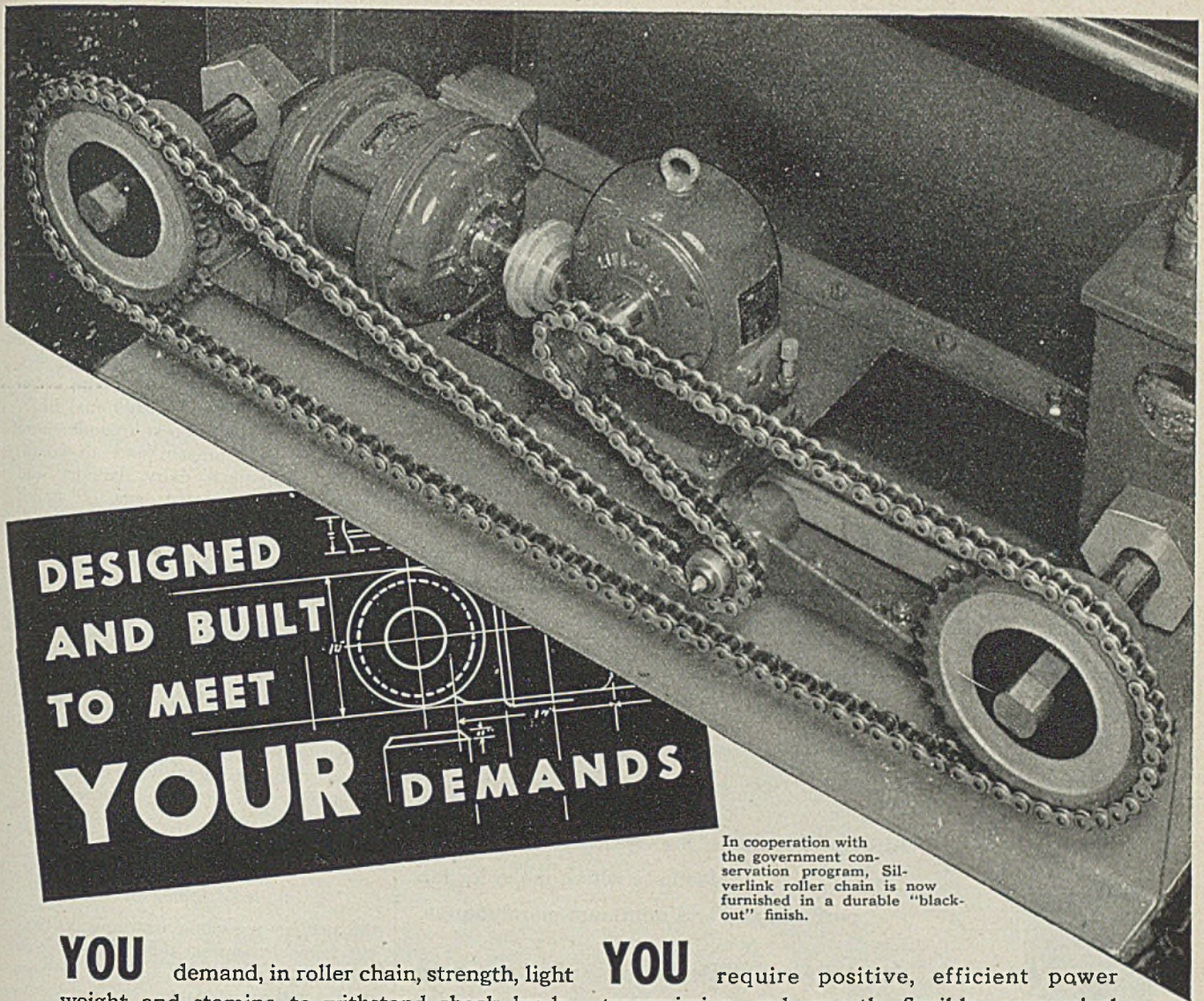
Seeks Postwar Acceptance Of Improved Finish

Not waiting till end of the war, Standard Steel Spring Co., Coraopolis, Pa., has begun a campaign to get acceptance of its improved Corronizing finish among ultimate consumers. In 1937 when the process was first developed, it required a heating operation which cost about \$10 per ton in addition to the cost of the electroplating. Now the improved process consists only in plating an extremely thin coating of nickel followed by a coating of nickel-zinc alloy.

Result is that for the same cost as a zinc coating, the Corronizing process is reported to give at least two and a half times the corrosion resistance. If work is treated to give same thickness as a zinc coating, corrosion resistance is ten times as great, according to company officials.

While wartime restrictions on use of nickel limit application of the process now, an immediate postwar market for 500,000 tons of Corronized steel—a \$50,000,000 market—is indicated by a recent survey. A huge ultimate market is visualized.

Until stopped by limitation orders, the



**DESIGNED
AND BUILT
TO MEET
YOUR DEMANDS**

In cooperation with the government conservation program, Silverlink roller chain is now furnished in a durable "black-out" finish.

YOU demand, in roller chain, strength, light weight and stamina to withstand shock loads. LINK-BELT'S strict standards of material and production methods coupled with exclusive design features, assure exceptional strength-to-weight ratio, and uniformly high efficiency. The exclusive curled roller cushions any shock and greatly lengthens the life of the chain.

YOU require low first cost and low upkeep. Skilled engineering applied to the design and manufacture of Silverlink Roller Chain assures economy in both installation and operation.

YOU require positive, efficient power transmission and smooth, flexible, economical operation of conveying equipment . . . LINK-BELT Silverlink ROLLER CHAIN, with its sound basic design, all-steel construction and precision manufacture, meets your needs completely!

YOU can profit through the broad experience of LINK-BELT chain engineers—let them help you bring your drives and conveyors to peak efficiency. Write for Roller Chain Engineering Data Book No. 1957.

LINK-BELT COMPANY

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*At Least
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more output*

Production will go up at least 25% when you install "Airgrip" Chucks and Revolving Cylinders. You will get more power than you need—holding power that will not fail up to the limit of machine power and tool endurance—power that means you can work every "Airgrip" equipped machine at its absolute maximum.

"Airgrip" Chucks, made in both two-jaw and three-jaw types, permit heavier cuts, coarser feeds—faster production—more parts per hour—at lower cost per unit.

"Airgrip" Revolving Air Cylinders embody the features which make for top performance and minimum maintenance.

Install "Airgrip" Devices now! Produce more for war and be ready to enter peacetime markets faster and at competitive prices.

Anker-Holth engineers are fully prepared to help you now with your pneumatic and hydraulic problems.

• This is the new Hi-Po super-charged hydraulic pump that delivers smooth, chatter-free power at 3000 lb. pressure. It is driven by a ½ hp. motor.

process was being used on copper thermostats to offset sulphur attack, on out-board motor parts, insecticide sprayer tanks, auto mufflers and engine snubbers, steel sheets, truss springs, pails and garbage cans.

Indicating commercial position of such products is Sears, Roebuck & Co.'s listing of fly screen at 7 cents per square foot for Corronized material as against 4 cents for a similar galvanized product. But guaranteed life for Corronizing is 15 years, compared with 5 for galvanized screen.

Other applications tested but delayed by the war include: Cans and containers, pump rods, farm equipment, wire corset stays, hot water tanks. Additional likely products for the process include: coal stokers, stoves, furnaces and air conditioning equipment; dairy, laundry and refrigeration equipment; gas, oil tanks; signs; metal boats; prefabricated buildings; telegraph, telephone and radio equipment.

Steel producers and fabricators are being licensed to use the process, since Standard Steel Spring Co. only owns the Corronizing process, does not produce any Corronized products. All items can be processed either before or after fabrication as Corronized steel can be deep drawn easily; solders well; spot, seam or arc welds satisfactorily. It can also be gas welded if a nickel rod is used.

Plating Processes

(Continued from Page 120)

the pen on recording instruments, blow out dripwells and set reducing valves on pneumatic controllers, and for periodic service and maintenance.

—The instrument thermal system should be insulated properly from the case and from ground. This is necessary to eliminate any closed electrical circuit from the sensitive bulb. Current flowing in such circuits may cause errors in reading in liquid-filled thermal systems, or may disintegrate the filling.

Remedies for this type of trouble follow:

—Insulate the thermal system tubing so it cannot short on the bus bars, electrode supports, tank or any other ground along its length. Rubber-covered or plastic protective tubing is best, but wood clamps or brackets are usually adequate for insulation.

—Insulate the thermal system from the rest of the instrument so the instrument case can be grounded without harm to the thermal system. This is especially important where instruments have electric motor chart drives or electric control systems.

—If the tank is insulated from ground, use insulating couplings in air lines to diaphragm motor-operated valves. If electric motor-operated valves are used, check the wiring circuit to see if the motor-operator is grounded through the electrical circuit and, if so, use a trans-

Anker-Holth Mfg. Co.

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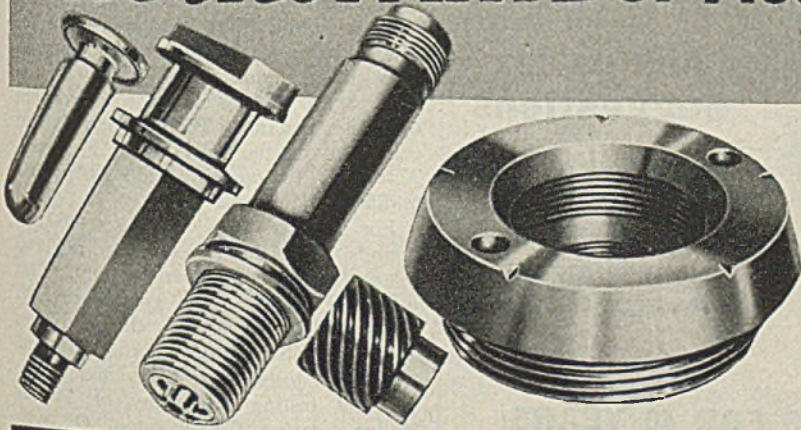
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B.L. First...

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in PEACE

in the PARTS of Modern Equipment



For high-speed production of fabricated parts in machinery or munitions . . . specify ULTRA-CUT, a fast cutting Bessemer Screw Stock.

Cold Finished Steel and Shafting

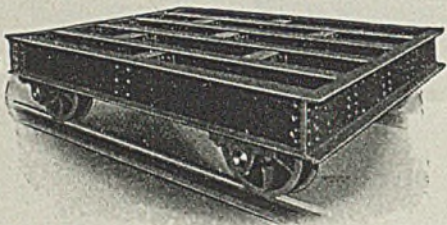
**BLISS &
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Sales Offices in all Principal Cities

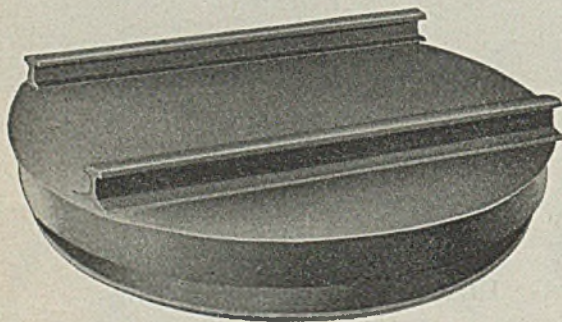
BUFFALO, N.Y.

All types of Industrial CARS, TRUCKS & TURNTABLES



We give **PROMPT ACTION**
to your specifications

CALL, WIRE
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**Ask us for
Suggestions**

on any car or truck
problem . . . or send
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in any form, notes,
drawings, etc.

INDUSTRIAL CAR BUILDERS FOR 40 YEARS

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COLUMBUS, OHIO

former to isolate this circuit from the grounded power circuit.

—Mount the sensitive bulb on an insulating bracket. A good method is to support it on the anode bar so that it is slightly behind the anodes.

Valve Installation: Much can be done to get long, trouble-free life from control valves by following these details during installation:

—Remember that it is necessary to adjust the packing gland and stem lubricator periodically and to regrind the seats and seat rings or replace composition seat disks. Locate the valves where there is room for a steamfitter to do these jobs. If the control valves are installed in a well or pit, provide ample ventilation.

—Always use block and by-pass valves. The block valves will facilitate opening the control valve for replacement or regrinding of parts. The by-pass valve will make it possible to continue operation of the plating bath under hand control.

—If electric motor-operated valves are used remember that these commonly have no "safe" position. In other words, the valves remain in whatever position they are in when power is shut off instead of going to either a closed or open position as diaphragm motor valves do when air is shut off.

Tubular Railway Axles

(Continued from Page 117)

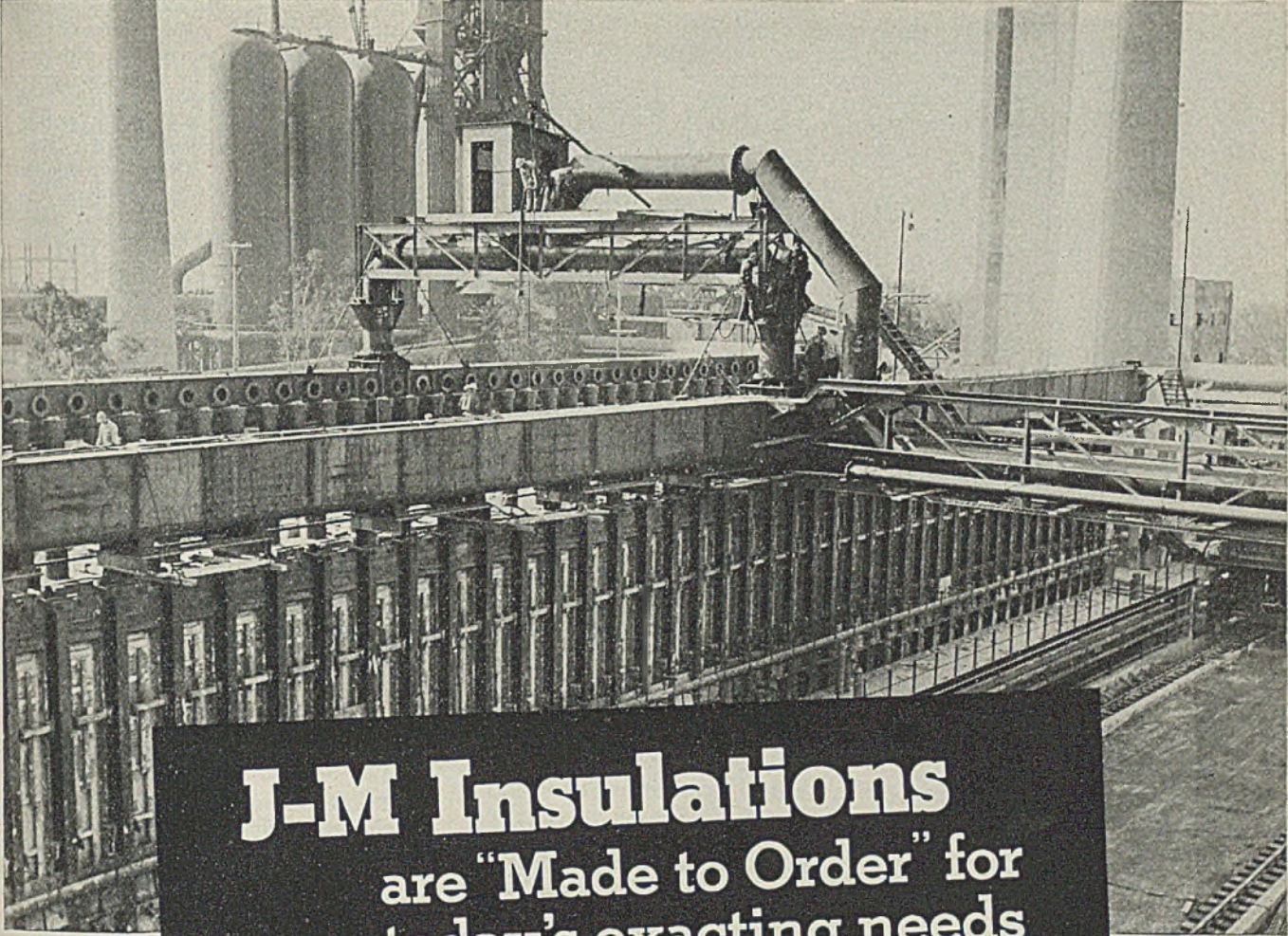
tank. In a final operation, the insides of each end are simultaneously machined to exact centers on a special machine and are ready for shipment.

Two types of tests were employed in determining the physical characteristics of the axles. The first type consisted of distortion or bending tests to determine stiffness under various loads. In these tests, collars were fitted to the wheel seats with the same tolerances with which wheel press fits were made. It was found that the deflection of tubular axles was less than that of solid axles under equivalent loads. In the solid axles, failure through permanent distortion began at 169,000 pounds and continued as the loads were increased. Actual yield occurred at 225,000 pounds to 226,000 pounds.

For tubular axles, loads of 369,600 pounds to 431,000 pounds were required to set the structures permanently. This indicated 56 per cent greater strength for the tubular axles over the solid axles before plastic deformation developed.

Fatigue tests were conducted at the physical testing laboratory of Timken Roller Bearing Co., Canton, O., with axles loaded on the basis of 19,000 pounds breaking stress at the wheel seats. The tubular axles withstood over 88,000,000 stress reversals without failure, which was equivalent to 155,000 miles on 36-inch wheels. Similar tests on solid axles at 19,000 pounds breaking stress resulted in failure at the wheel seats at 857,000 to 2,755,000 stress reversals.

The greater physical strength of the



J-M Insulations

are "Made to Order" for
today's exacting needs

J-M Industrial Insulations cover every type of heat control. Each type of insulation is tailor-made to fit the particular job for which it was designed. In addition: Johns-Manville's 85 years' experience in every conceivable type of insulation problem makes it possible for J-M Engineers to design insulation applications for special conditions with utmost speed, thoroughness and economy. Following are just a few of the many types of J-M Industrial Insulations:

INSULATION FOR TEMPERATURES TO 1900° F. J-M Superex Blocks have long been standard for this service. High heat resistance, low thermal conductivity. Sizes 3" x 18", 6" x 36" and 12" x 36"; from 1" to 4" thick.

FURNACE INSULATION UP TO 2600° F. J-M Insulating Brick and Insulating Fire Brick are available in 7 types, with temperature limits ranging from 1600° F. to 2600° F. All provide light weight, low conductivity.

FOR TEMPERATURES TO 600° F. J-M 85% Magnesia has been for many years the most widely used block and pipe insulation for temperatures to 600° F. and, in combination with Superex, for higher temperatures. Maintains high insulating efficiency. Standard block sizes 3" x 18", 6" x 36" and 12" x 36"; from 1" to 4" thick.

FOR STEAM LINES UP TO 700° F. J-M Asbesto-Sponge Felted Pipe Insulation is recommended where maximum efficiency, high salvage and resistance to abuse are essential. For temperatures over 700°, used in combination with Superex. It is available in 3-ft. lengths, from 1" to 3" thick, for standard pipe sizes.

SIL-O-CEL C-3 CONCRETE—Cast on the job from Sil-O-Cel C-3 aggregate and cement. Sets up into a strong, durable semi-refractory insulating concrete for temperatures up to 1800° F. Crushing strength: 1000 lbs. per sq. in.

For details on these materials, and on the complete J-M Insulation line, write for Catalog GI-6A. Johns-Manville, 22 East 40th Street, New York 16, N. Y.

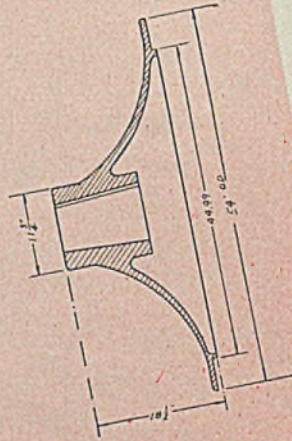
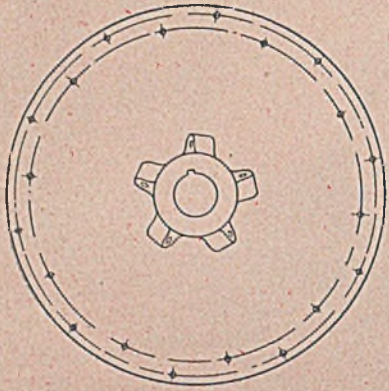
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INDUSTRIAL INSULATIONS

FOR EVERY TEMPERATURE... FOR EVERY SERVICE

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PRODUCTS

November 15, 1943

163



Weight 940 lbs.

HUBS OF STAINLESS STEEL

For the Fans Used in Synthetic Rubber Plants

● Included in the essential equipment used in the manufacture of synthetic rubber are the large fans built by the American Blower Corporation. Hubs (4 feet in diameter) cast of Stainless Steel Alloy were furnished by MICHIANA for these fans,—corrosion-resistant alloy being required because of the presence of corrosive gases.

So vital to the War effort and all transportation is the production of rubber that great care was exercised in the overall engineering and in the design and quality of all the installed equipment.

MICHIANA Heat- and Corrosion-Resistant Alloy Castings have had the endorsement of experienced production men for many years. MICHIANA experience covers a wide diversity of alloy casting production and application during over a quarter of a century of specialization in this field.



Recommendations that you will find helpful are yours for the asking.

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- Muffles
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MICHIANA
Heat-Resistant and
Corrosion-Resistant
ALLOY CASTINGS

tubular axles is attributed to several factors. First, the greater external diameter between the wheel seats provides greater strength than the solid axles. Second, the tubular material, as produced by the Pilger process, is a forged product with the usual physical benefits conferred by forging. Third, subsequent heat treatment further improves the physical characteristics. The heat treatment also makes the tubular axles less subject to wear at the journals.

In one of the service tests, tubular axles and solid axles were placed on the same trucks of heavy dump cars used on the Monessen and Southwestern railway. Considerably less wear was found on the tubular journals than on the solid journals, especially endwise, after identical periods of service.

Studies by company engineers show that a further advantage has been found in that tubular axles run cooler which makes them less susceptible to some types of hot boxes. Comprehensive data on this point, however, cannot be secured until large numbers of axles have been in service for some period of time.

ASME Session To Feature Milling at Super Speeds

Progress in milling at extraordinarily high speeds will be the subject of a symposium at the annual meeting of American Society of Mechanical Engineers in New York, sponsored by the Production Engineering Division, of which Warner Seely, secretary, Warner & Swasey Co., Cleveland, is chairman.

This symposium will be held at Hotel Pennsylvania, New York, at eight o'clock Monday evening, Nov. 29. Engineers from the aircraft plants of Consolidated Vultee and from Boeing on the West Coast, as well as from Bell Aircraft Corp., Buffalo, will describe their recent developments which are resulting in removal of metal at hitherto unheard-of speeds. Machine tool builders and tool engineers will also participate, showing slides and motion pictures of super-speed cutters at close range.

Among aircraft production authorities who will speak will be: Arthur A. Schwartz, chief tool research engineer, Bell Aircraft Corp., and Wallace Brainard, supervisor of planning, Consolidated Vultee Aircraft Corp.

While developments in this field are very new, interest in the subject is widespread because of its possible revolutionary effect on milling machine design and general milling practice. It is expected the meeting will be attended by production engineers from a large number of war plants wherein serious consideration is being given to what will be done after the war—and how it will be done.

All engineers and production men who have some experience in this field, or who are interested in the phenomenal progress already achieved, are invited to attend the symposium, which will be open to them regardless of whether or not they are members of ASME.

NE Steel Specifications

(Concluded from Page 124)

specification requirements for alloy steel compositions and by the issuance of specifications covering steels of leaner composition such as the NE steels which now account for a very substantial proportion of alloy steel production. The TACs have served as a very effective means of emphasizing the need for conversion to the leaner compositions and for the dissemination of engineering information on their application and use.

While the NESS effort has been directed toward standardization and simplification of products to obtain increased production to meet war needs, most of the work has been of such character as to be beneficial to postwar and peace time production.

Steel mill commodities are used very extensively for conversion into the very wide variety of end products made from steel. The NESS work has been somewhat impeded because designs and uses of some end products were established without benefit of basic product standards and could not be disturbed under present conditions.

This emphasizes the need for standardization and simplification of these basic commodities in order that designers and engineers may have a sound and secure starting point, also that much war time trouble could be avoided if these basic standards were more generally available and more uniformly adopted.

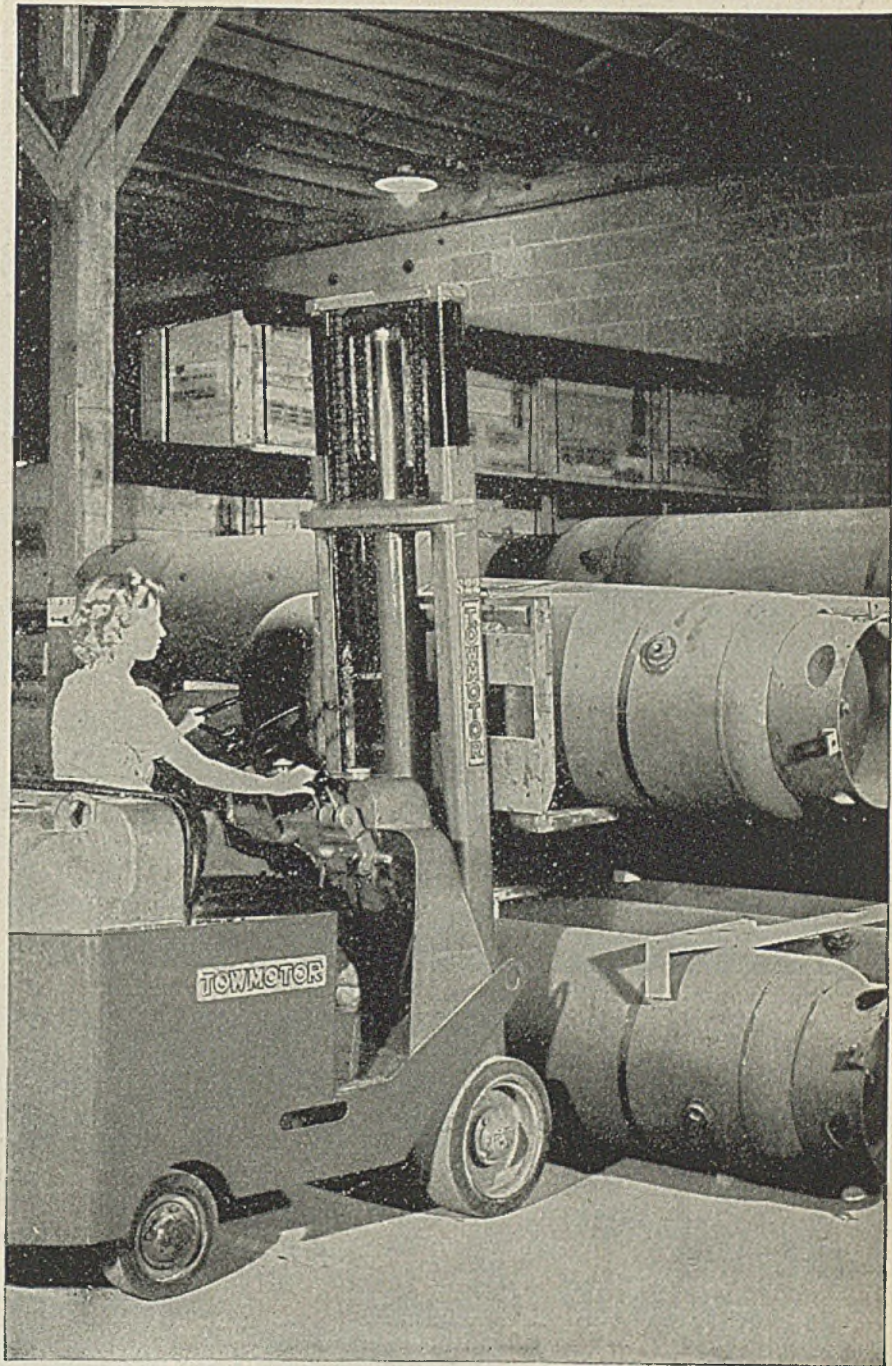
Postwar Use of Open-Flame Treating Predicted

A definite evolution of open-flame heating machines that will parallel industrial furnaces is in the making, Fred W. Marklin of the American Gas Association, Metal Treating and Melting Group, Philadelphia, stated in an address before the war conference on industrial and commercial gas held in Detroit recently. Until now, he said, due to indifference, skepticism or unwillingness to experiment, very little was done to develop full possibilities of furnaceless heating.

Reasons he cited for the present trend of furnaceless heating—defined as the heating of specific faces, projections or portions of metal parts above or below the critical temperature by means of open-flame burner arrangements, and subsequent quenching or cooling to develop hardness or anneal without affecting the core or body of the piece—are:

Ease of placing heat directly where wanted, at the rate desired and for as long a period as necessary; less structural work and floor space requirement; less distortion of work. Heat machines can be definitely timed to the job on a production line basis; they can maintain routine schedules; they employ unskilled labor instead of skilled heat treaters, and also can be installed anywhere in a production line.

Mr. Marklin pointed out that, in the opinion of many informed combustion



Irregular shapes and sizes

present unusual materials handling problems

which are quickly and easily overcome

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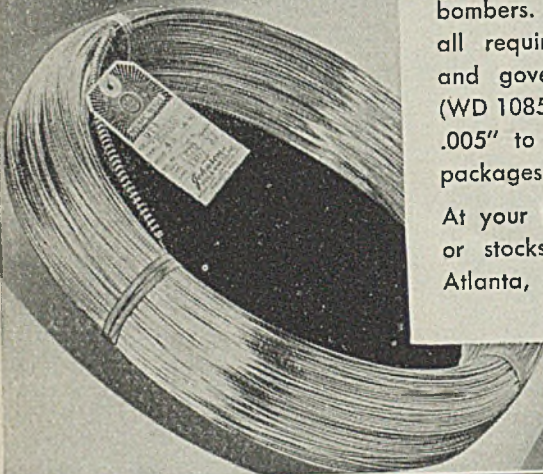


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STRAIGHT-GAS POWERED INDUSTRIAL TRUCKS EXCLUSIVELY—SINCE 1919

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At your local mill supply house, or stocks in Worcester, Akron, Atlanta, Chicago, Los Angeles.

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How to get any of
**144 Different
Electric Hoists
in One!**



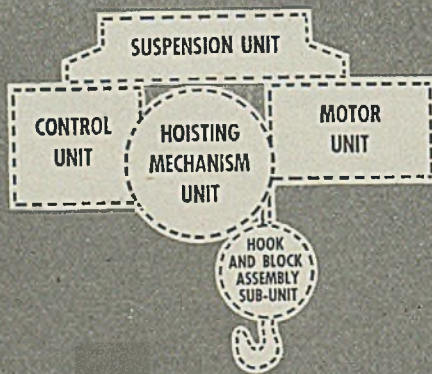
This booklet gives you details of the Reading Unit Construction Plan for special hoist equipment at standard equipment cost.

- With the Reading Unit Construction Plan, all electric hoists are composed of four interchangeable units: 1. Suspension Unit; 2. Hoisting Unit; 3. Motor Unit and 4. Control Unit. Combining these *standard* units in various ways gives 144 different hoists—each designed to do a specific job, and each purchased at standard equipment cost.

- A note on your company letterhead will bring you a copy of MODERN MATERIALS HANDLING MAGIC to show you just how the Reading Unit Construction Plan works.

Reading Chain & Block Corporation, 2102 Adams St., Reading, Pa.

READING CHAIN HOISTS-ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES



engineers, burners for furnaceless heating machines must use not only the convected heat from 100 per cent combustion, but also should incorporate the speed advantage of radiation. That, plus still higher manifold pressures—thought to be impractical today—it is believed will be used in order to obtain great concentrations of heat in relatively small areas.

"Some one might at this point connect the use of oxygen with high concentrations of heat," he said. "It is of course being done, and there are probably a few operations where oxygen is absolutely necessary. But, except in special cases, I believe we can dismiss that by its high cost, the complications involved and the item of safety. Recent installations using air only have given us courage to think that a majority of jobs can be handled with present available equipment, whereas they could not have been a few years ago. And, with improvements, ultimately 95 per cent of all furnaceless heating jobs will eventually be worked out without the use of oxygen. This can be envisioned by the fact we now have furnaceless burners that deliver at the rate of 40,000,000 B.t.u.'s per hour per cubic foot of combustion space, whereas a few years ago it was only possible to deliver a maximum of about 4,000,000 B.t.u.'s. That shows an improvement of 10 to 1. This perhaps can be extended further in proportion to the amount of effort put forth on development and research."

Important in Present War Effort

Mr. Marklin then pointed out that the importance of furnaceless heating during the present war can readily be seen by the ever increasing demand for selective heat treating of ordnance and parts of war machines. This, he said, has been accomplished in open-flame heat-treat machines where time and temperature conditions of the selected sections can be finely controlled.

"The enormous backlog demand for consumer goods now accumulating will call for many new applications of furnaceless heat treating," he said. "And here is where flexible open gas burners as developed for war work can be converted quickly to the needs of peacetime goods. From that standpoint we are indeed fortunate in that our heat machines as contrasted to other heat-energy machines are not composed of highly specialized and expensive dies, jigs and clamps that must be replaced entirely whenever a change is made in size, shape or selected portion to be heat treated.

"Government requirements have of necessity clamped the cloak of censorship on the publication of all names, places and methods of filling its enormous stockpile. It can be said, however, that even a partial list of processes now using the furnaceless heat-treating methods and machines includes hardening of teeth of band saws; annealing, tempering and hardening of parts of screws; annealing ends of springs; neck annealing of 20-millimeter steel cartridge cases;

neck and mouth annealing of 37 to 75-millimeter cases; annealing of nonferrous wire; metallizing or spraying metals which include coatings of aluminum, bronzes, cadmium, copper, lead, nickel, solder, tin and zinc; scarfing of slabs or billets; silver soldering. Also brazing and descaling; edge rolling of metal containers; hardening of armor-piercing shot, treads of caterpillar grousers and sprocket teeth for tank treads."

Chemical Analysis of Metals by A.S.T.M.

A.S.T.M. *Methods of Chemical Analysis of Metals*; cloth, 323 pages, 6 x 9 inches; published by American Society for Testing Materials, 260 South Broad street, Philadelphia 2, for \$3.

When the A.S.T.M. book of standards was issued for the first time in three volumes a few years ago the methods of chemical analysis were published in a separate volume. After intensive work, committees on chemical and spectographic analysis have furnished a second volume.

The volume gives two sampling methods, 17 standard and tentative methods, of which four are for analysis of ferrous metals, ten for nonferrous and three cover quantitative spectrochemical procedures for nonferrous metals. An important new feature is the tentative recommended practice* for apparatus and reagents for chemical analysis of metals.

Other helpful material published as information gives methods for chemical analysis of special bronzes and bronzes and white metal bearing alloys, as well as a procedure for aluminum in solder metal and methods of sampling wrought metals and alloys for determination of chemical composition. An index covering 20 pages enables finding applicable procedures easily.

Allegheny Ludlum Offers Film on Welding Stainless

As a contribution to the war program, Allegheny Ludlum Steel Corp., Brackenridge, Pa., is offering without charge its new motion picture "Welding Stainless Steel" to companies, trade or technical groups, industrial schools or colleges to serve as an aid in teaching welding students, as well as welders familiar with carbon steel welding.

While primarily produced to explain stainless steel welding in simple terms that a shopman can understand, the 16-millimeter full-color sound film also contains much to interest the most experienced metallurgist or engineer.

Laying beads with one pass of the arc, two-sided welding, as well as multiple-bead welding on heavy gages, are thoroughly explained, and further clarified with appropriate charts. The two-reel film, which takes about 25 minutes to show, can be obtained directly from the company.

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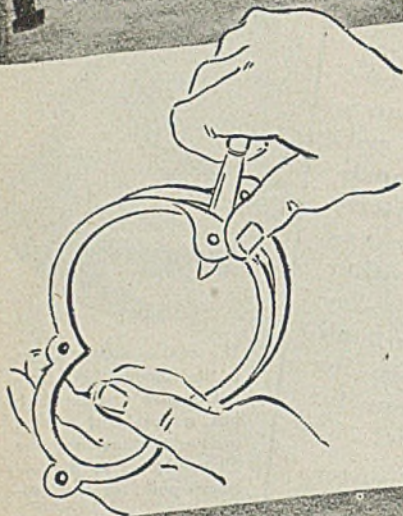
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2046

Hot Dip Lead Coating

(Concluded from Page 130)

also makes working conditions more pleasant for the operators. Skimming and replacement of flux on the molten lead bath are required less frequently than in the case of zinc.

Although the Western Electric Co. is applying lead coatings on over 60 per cent of the pole line hardware items which it manufactures, time has not permitted life tests to be made under all operating conditions. However, with the deposit being obtained, and the inherent protective qualities of lead, this coating is considered a satisfactory substitute.

In early work on lead coating, numerous experiments also were made with various lead alloys, using the above procedure in applying the coatings. Lead-antimony alloys, containing about 3 per cent of antimony showed favorable results in producing smooth coatings, which appear to have all the qualifications for good covering.

Western Electric Co. has filed application for United States patent covering this process, but in the interest of conservation of certain metals it is the desire of the company that all manufacturers be free to use this process during the war insofar as any patents or applications owned by the Western Electric Co. are concerned.

Detroit Tap & Tool Offers Standard Milling Cutters

To speed delivery and simplify ordering of multiple thread milling cutters, Detroit Tap & Tool Co., 8432 Butler, Detroit 11, is now carrying a line of standardized thread milling cutters in stock. The blanks of the "standard" sizes are all finish machined and heat treated, ready for finish grinding of threads.

The sizes selected for standardization were chosen following a survey to determine the most widely used cutter types and sizes and thread milling equipment used in industry. Results of this investigation enable Detroit Tap to establish a limited list containing the types, forms and sizes of standardized blanks from which those finished cutters most widely demanded by manufacturers of war equipment could be quickly produced. Thus to place an order, it is now necessary only to specify the blank number and thread specifications desired.

Included in the line are both shell and shank type cutters. The diameter range of the 40 different shell type standard blanks in stock is from 1½ to 3½ inches. The number of flutes decided upon for the various sizes of standard blanks are those found to give the best combinations of tool life, accuracy and convenience of tool sharpening. Hole sizes correspond to standard thread milling machine arbors. The blanks have right-hand spiral flutes and a 5-degree rake angle.

Twelve different shank type blanks are

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This booklet gives expression to Spriesch ideas and spirit which industrial executives have said are thought-provoking, informative and useful.

Many who sent for this booklet have later requested further information. You, too, may be interested in the new-era Spriesch Contract Manufacturing Facilities we are now arranging to make available.

Since 1928 we have produced continuously intricate aircraft bomb-releasing mechanisms for the Army and later for the Navy. While all our facilities are used for war work ... we can THINK on problems of special machines, tools, dies; experimental or mass production of parts or complete assemblies.

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STEEL

carried in stock, ranging from $\frac{3}{4}$ to $1\frac{1}{2}$ inches in diameter. Blanks of from $\frac{3}{4}$ to 1-inch diameter have six flutes; those ranging from $1\frac{1}{4}$ to $1\frac{1}{2}$ -inch diameter have eight flutes. As with the shell blanks, all shank type blanks have right-hand spiral flutes and a 5-degree rake angle.

Even though the company is carrying the above line in stock, it still will continue to supply special size thread cutters to take care of specialized requirements which cannot be met with the new standard blanks.

Permanent Repairs Made By Floor Patching Material

Emeri-Crete, a new concrete or cement floor patching material, is announced by Walter Maguire Co. Inc., 330 West Forty-second street, New York 18. It is primarily for use in filling cracks, small depressions, ruts or other imperfections in floors. It was developed to meet a demand for a ready-mixed material which could be applied immediately after water has been added.

The material is composed of pure emery particles mixed with a special quick-setting binder which permits use of the floor in 6 or 7 hours after the repair has been made. According to the company, patches made with the material will not shrink, have great adhesive properties, and if applied in accordance with directions will make repairs permanent.

It is packed in small packages, permitting the use of the right amount of material to do the job at hand with no waste.

Wire-Drawing Cored Dies Extended to Smaller Sizes

The tremendous impetus given by the war to the drawing of fine steel wire for aircraft control cables, barrage balloon anchorage, ship construction and other military uses has made the development of round hole cored dies highly desirable. To assist mills producing fine wire, Carboly Co. Inc., Detroit, has made available dies of this type in stock sizes as small as 0.004 to 0.007-inch. The new dies are available with standard size R-2 Carboly nibs and casing sizes either 1 or $1\frac{1}{2}$ -inch x $9/16$ -inch.

Heretofore it was practical to produce such dies mainly in rough drilled form at substantially higher costs than cored dies. The smallest cored die formerly available was a 0.015-inch hole size for finishing to 0.020-inch. For smaller sizes it was necessary to purchase more costly rough drilled dies or blank dies for piercing by the mill. The latter alternative was previously necessary in order to produce diameters of wire down to 0.010-inch. Thus, according to the company, the new smaller cored die sizes mean a further increase in economy, saving valuable machine and man-hours in the die room, either at the mill or in the shop of the supplier.

OHIO SHEARS

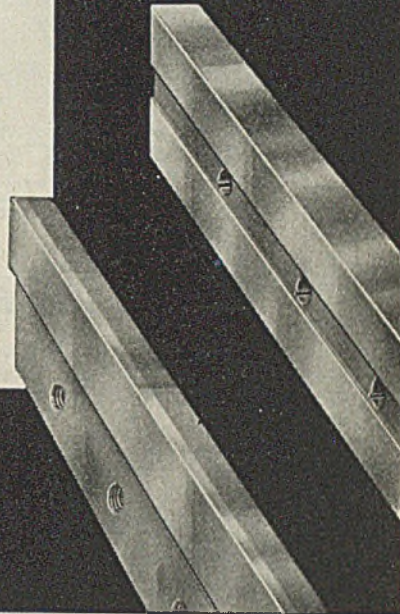
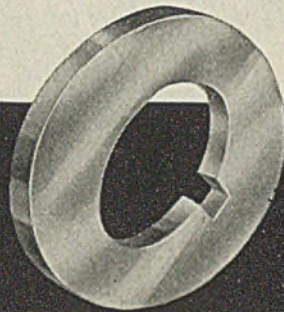
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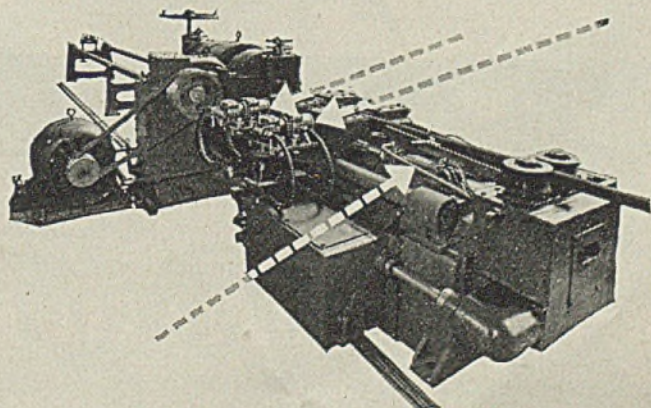
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NE User Report No. 22

(Concluded from Page 135)

replacements are not permanent."

It is impossible to say what symbols will be used to describe NE steels after the war, but in any case, many of the "lean alloys" will remain in use, and the trend will be toward standardization on fewer grades. Now that much pioneering work has been done in this direction, there is no reason why the automobile industry, the machine tool builders and many other industries should not profit by the experience which has been gained. Intelligent engineers will more and more plan to simplify their steel selection, especially when peacetime operation resumes.

**"Gas Masks" for Industry
 Cut Air-Conditioning Losses**

In the operation of industrial air conditioning systems it has been the practice to draw air into the plant, chill or heat it, and otherwise bring it to proper conditioning. However, as soon as the air has picked up a certain amount of odors, it is exhausted and a new batch is brought in. This air which has been exhausted still retains proper temperature and humidity conditions.

The necessity of heating or cooling large quantities of new air is what runs up cost of the original installation and its operation. To eliminate the losses from discharging treated air W. B. Connor Engineering Corp. of New York has developed air recovery equipment which salvages conditioned air, permitting it to be used over and over again. Only small amount of new outside air need be admitted for oxygen requirements. The Connor air recovery system is now widely used for this purpose and for removal of obnoxious and toxic gases encountered in manufacturing.

The equipment is, in effect, a giant gas mask, utilizing activated carbon. Rows of carbon-filled canisters—their number depending upon the amount of air which they must treat and the degree of gaseous impurities they will encounter—are arranged on manifold plates. Arrangement is such that contaminated air is drawn through carbon which absorbs odors and gases from the otherwise conditioned air and it is then readmitted to the conditioned enclosures. This process is repeated indefinitely, only a small portion of new air being admitted at each cycle. Carbon may be reactivated and utilized repeatedly.

If air recovery equipment is installed with the original system, it is estimated that each 1000 cubic feet of waste air per minute saved will conserve 3 tons of installed refrigeration, 100,000 B.t.u.'s of installed heating capacity, 3000 kilowatt hours of current per cooling season, and 2000 gallons of fuel oil or 11 tons of coal per heating season. Among the critical materials conserved are boilers, pumps, heating coils, compressors, condensers,

STEEL

pipng, air washers, coolers and cooling coils.

In planning an air conditioning system for a midwestern plant of Pratt & Whitney United Aircraft Corp., it was determined that requisite ventilation for certain critical areas ordinarily demanding a high air change rate would be 458,000 cubic feet per minute. Through the aid of activated carbon adsorption, it was possible to divide this requirement into 77,000 cubic feet per minute of outside air and 381,000 cubic feet per minute of decontaminated return air added to recirculation. *Thus the outside air load was reduced by 80 per cent.* Since the primary purpose of the carbon application was to reduce the outside air conditioning load, it then became necessary for it to be in operation only during the periods when outside temperature rose above 78 or fell below 55 degrees Fabr.

Air Recovery, as it is known, is also at work in the cabs of overhead cranes being operated in plants where the nature of the work exposes cranemen to dangerous toxic fumes which are more concentrated at their higher elevation. All air for ventilating the cab is drawn first through a dust filter and then through the gas adsorbers by a suction fan. Air within the cab is recirculated, outside air added as needed by a damper.

War-Winning Suggestions Offered to Allied Industry

Suggestions or practical ideas which have been tested in the shop or laboratory, and have been adopted as standard practices in the plants where they originated are being circulated in printed form for the first time by the Suggestion Exchange Section, War Production Drive Headquarters, War Production Board, Washington. These, before being adopted, were certified to the War Production Drive Headquarters by labor-management production committees. They were also further reviewed at the War Production Board by the Board of Individual Awards, composed of technicians and engineers in various industrial fields.

The compilation, entitled "War-Winning Suggestions," was printed in order that the suggestions could be brought to the attention of allied industry. All suggestions are classified according to the industry in which they originated. Many apply to more than one industrial field.

According to the Suggestion Exchange Section, labor-management committees, qualified representatives of war plants and services, union officials and individuals engaged in war work are at liberty to request information on the suggestions they feel may be profitably used to increase war production. Complete information is offered on all of the numbered suggestions appearing in the compilation. Data usually include a sketch, blue print or photograph as well as full descriptions with necessary specifications.

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