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STEEL

The Magazine of Metalworking and Metalproducing

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TECHNICAL

FEATURES

MARKETS

NEXT WEEK...

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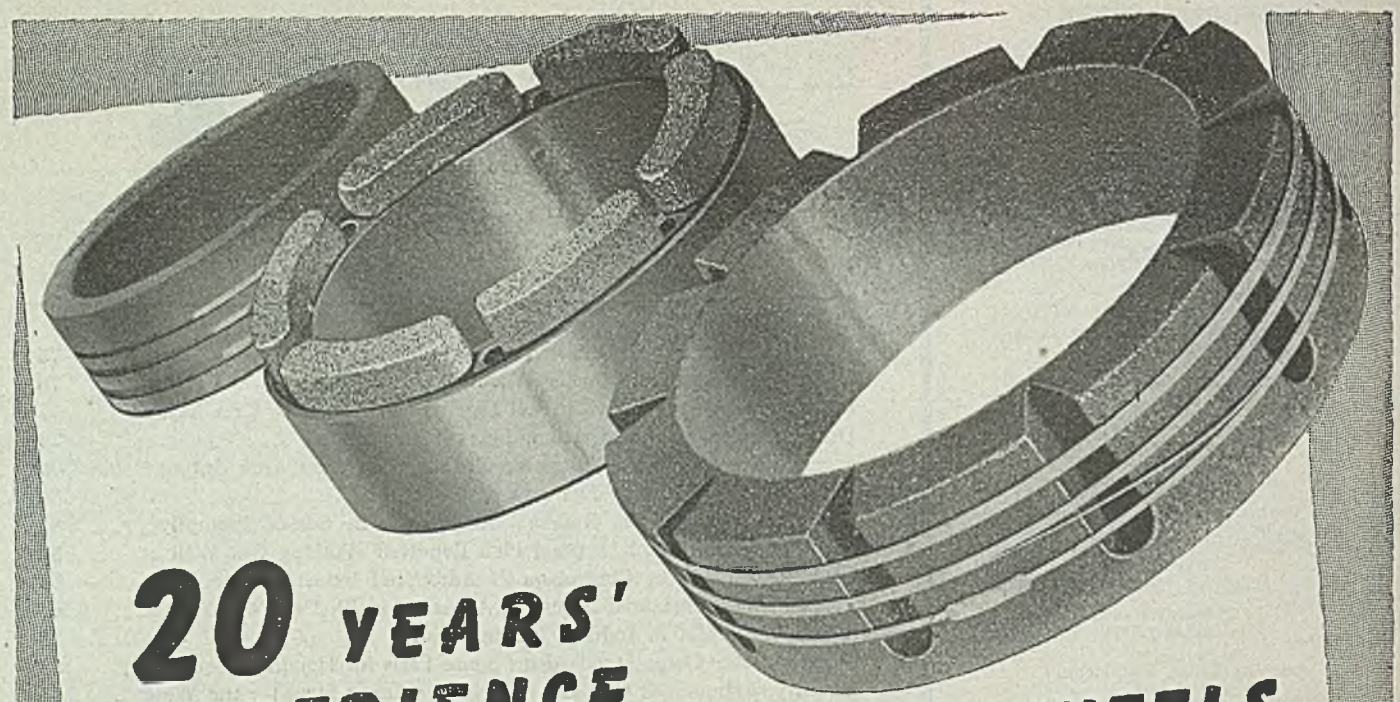
Hot Dip Galvanizing—Control of Oxidation
Testing Cylindrical Forgings
Preserving Artillery Pieces in Welded Steel Containers
Heat Treating Aluminum—Atmospheres, Heating Media



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As the EDITOR VIEWS the NEWS

Is Speech Free?

Apparently the National Labor Relations Board holds to the naive idea that all workers have a natural desire to join a union. According to the record, in most cases where employees of a plant vote against a union as their bargaining agent, NLRB seems utterly incapable of believing that the decision reflects the true wishes of the voters. It considers that the rejection of the union is prima facie evidence that the employer has influenced the vote.

One should not accuse NLRB of bias in this respect on the basis of a few cases. However, when one considers the numerous times in which the board not only has thrown out elections which were adverse to a favored union but also has thimble-rigged subsequent elections to give the union undue advantage, it is impossible to escape the conclusion that the board is deliberately pursuing a one-sided policy.

Recent evidence of this is found in the case of Clark Bros. Co. of Olean, N. Y., whose employees twice had voted decisively against a CIO union as their bargaining agent. Just before the last election, Clark officials called employees into a meeting and, according to NLRB, gave them anti-CIO advice. Messrs. Paul M. Herzog and John M. Houston, in a majority decision, ruled that the circumstances under which this advice was presented constitute a violation of the Wagner act. Gerard D. Reilly, third member of the board, dissented. Here is an excerpt from the decision:

"The Board has long recognized that 'the rights guaranteed to the employees by the act include the full freedom to receive aid, advice and information from others concerning those rights and their enjoyment.' Such freedom is meaningless, however, unless the employees are also free to determine whether or not to receive such aid, advice and information. To force employees to receive such aid, advice and information impairs that freedom; it is calculated to, and does, interfere with the selection of a representative of the employees' choice. And this is so, wholly apart from the fact that the speech itself may be privileged under the Constitution."

Most persons go to meetings in hope of hearing something of interest and with full confidence that they can reject or accept whatever they hear. They do not need nor do they want the foolish and impractical protection NLRB gratuitously offers in this decision.

Unwittingly, perhaps, Messrs. Herzog and Houston are helping to make revision of the Wagner act a must objective of the next Congress.

STEEL
September 9, 1946

WHY RECOVERY DRAGS: In its latest "special report to industry," STEEL this week presents a composite picture of what nearly 1000 users of materials, component parts and metalworking equipment have to say about their inventories, duplication of orders, deliveries promised by suppliers, limitations on purchases, equipment on order, further purchases planned and cancellations of orders prompted by excessively remote deliveries.

The replies of these users are extremely significant. They reflect the trials and tribulations of representative companies in the metalworking industries whose efforts to reconvert rapidly from a wartime to a peacetime basis have been thwarted by innumerable obstacles. In the spotty situation revealed by the returns of this questionnaire may be found part of the answer to why the stock market dipped so sickenly last midweek.

Judging from the returns, the major causes of shortages and unbalanced supplies are first, strikes and work stoppages; second, dislocations resulting from price controls; and third, the tremendous increase in the demand for products of the metalworking industries. Most critical items seem to be

(OVER)

galvanized sheets, hot and cold rolled sheets and strip, copper and brass mill products, stampings, electrical equipment (particularly fractional horsepower motors), standard lathes, and stamping and forming presses. A heartening feature of the report is that on the whole the volume of duplicate ordering is not as extensive as had been estimated in many quarters. —pp. 85-92

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QMC STANDARDIZES: During the war, the U. S. Army bought 160 different models of materials handling equipment from 30 manufacturers. Few of the manufacturers made their own engines, transmissions, axles and similar components. They bought them from suppliers. As a result, many of the parts of one piece of equipment are identical with those of other manufacturers.

This duplication prompted the Quartermaster Corps to undertake an 8-month survey to standardize such parts. This has resulted in a 68 per cent reduction in the volume of stock numbers for spare parts, a 33 per cent saving in warehousing space for stocks of spare parts and a 40 per cent saving in time required for their selection and packing.

The problem the Quartermaster Corps tackled is not unlike that which confronts the stores and purchasing departments of many large industrial corporations. The QMC solution involves economies that should be exceedingly attractive to private industry. —p. 93

° ° °

SWEATING IT OUT: Inability to obtain steel is causing doubt, confusion and suspicion that probably are more acute now than at any time during the war. According to the statistics of capacity and current rates of production, something in excess of 1,150,000 tons of rolled steel should be passing over the shipping platforms of rolling mills every week. This is an abundance of tonnage according to all previous peacetime yardsticks, yet the wolf cry of consumers is louder than ever.

Unfortunately the situation cannot be solved over night. Demand is unprecedented. Government controls, partly relaxed and partly in force in comparison to wartime standards, probably are doing as much harm as good. There is complaint that larger companies are getting the breaks and that too much of the available output is being allocated arbitrarily.

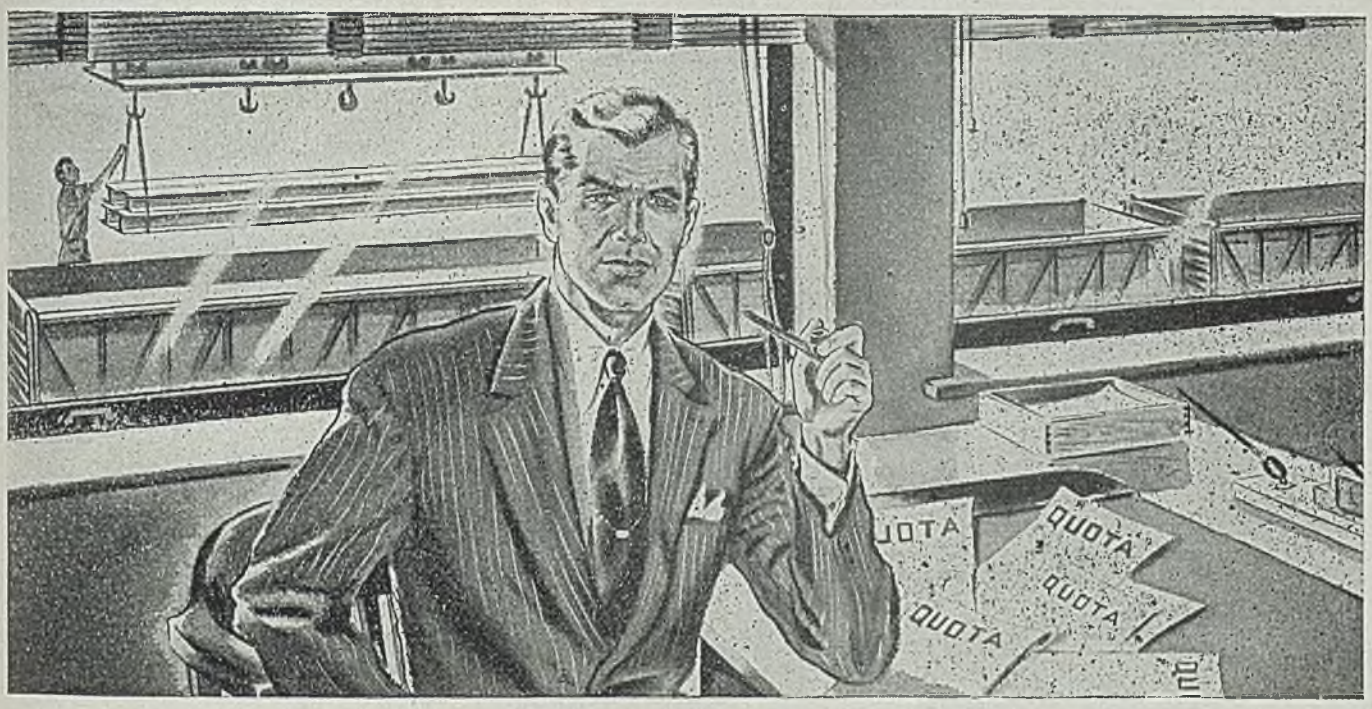
This is bad. One could hope that producers and consumers can find some way to work out of this before the government decides that the only solution is total regulation of supply.

—pp. 75, 85, 104

SIGNS OF THE TIMES: Of the $281,500,000 which the War Department is committed to spend on research and development work during the fiscal year ending June 30, 1947 (p. 96), $185,500,000 will go to the Air Corps, $52 million to Ordnance Service and Supplies and $25 million to Signal Service. Most of the money will be spent with private companies and research institutions doing Army work under contract. . . . Automobile builders and body manufacturers are encountering difficulty in obtaining experienced sheet metal layout men, designers, draftsmen and other specialized engineering talent (p. 99) for the development of new body designs for 1948 models. . . . U. S. Navy has awarded a contract to Aetna Standard Engineering Co. for 3277 air-tight steel containers (p. 102) in which to store and protect guns on vessels of the Navy's inactive fleet. The units will be fabricated of high grade sheet steel by welding. . . . Civilian Production Administration estimates that there are from six to a dozen fractional horsepower motors (p. 131) in an average American home. Although production of these small motors has been mounting steadily and shipments in August totaled about 1,700,000 (p. 100), manufacturers still are confronted with a backlog of orders of about 30 million. . . . Machine Tool Editor Guy Hubbard notes the tendency among machine tool builders to study new models in three dimensions before they are built. This can be done by means of wooden or modeling clay "mock-ups" (p. 117) or by an engineer who happens to be adept at rapidly sketching his own or his associates' creative ideas in a perspective that permits easy visualization of how the machine will look. . . . Housing Expediter Wilson W. Wyatt is striving hard to include at least 200,000 prefabricated metal homes in the veterans housing program in 1947. One contract of the new "guaranteed-market" type, calling for 10,000 homes made largely of light-gage steel (p. 94), may be announced soon and one of several contracts involving the construction of aluminum houses is said to be near the signature stage. . . . In tests conducted on an open-hearth furnace at Hamilton, Ont., oxygen introduced so as to produce a controlled flame directed at the furnace charge during the meltdown period (p. 140) reduced scrap melting time substantially and apparently had no adverse effect upon furnace lining. The results suggest a possibility of increasing production of existing furnaces appreciably with no expenditure for extra capital equipment.

E. C. Shane

EDITOR-IN-CHIEF



We Don't Like "Quotas" Either

There are times when steel buyers must be on the verge of going berserk at the sound of the word "quota." We don't like quotas either . . .

But we have no choice, there just isn't enough steel to go around and we want to be fair with all of our customers.

We look forward to the time when *you*, the steel buyer, will tell *us* how much you will buy and we can strive to earn a large share of your tonnage.

In the meantime, while maintaining Inland quality and service at their usual high levels, we pride ourselves on an additional factor.

WE HAVE KEPT OUR WORD! . . . and, subject only to interferences beyond our control (strikes, etc.), we have made good. The commitments we have given our customers have justified their faith in INLAND as a RELIABLE SOURCE.

SELL YOUR SCRAP NOW!
More scrap is needed to make the steel so desperately needed by American industry.

INLAND STEEL

● Inland Steel Company, 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Paul, St. Louis.

PRINCIPAL PRODUCTS: BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE • FLOOR PLATE • PILING • REINFORCING BARS • RAILS • TRACK ACCESSORIES

Contractor reports that Hi-Bond from Ryerson stocks, used exclusively on this job, simplifies tying, yet gives firmer framework, because of gear-like contact between scientifically designed bars.

Designed for Greater Anchorage in Concrete Construction

Shipped Promptly from Ryerson Stocks

Here's a combination that always gives top performance —Hi-Bond bars plus Ryerson reinforcing service. As with other steel products today the needed size or quantity of Hi-Bond has sometimes been difficult to obtain. But all Ryerson plants offer service on a wide range of construction steels and Ryerson plants in Chicago, Detroit and Cincinnati regularly stock Hi-Bond rounds in sizes from ⅜ to 1.53 inches (1¼" square equivalent) and greater tonnage should be available before long.

More and more engineers are specifying Hi-Bond because laboratory tests conclusively prove that scientific Hi-Bond design creates a greater bonding grip with concrete. This means better, stronger construction and an increased resistance to the formation of tensile cracks.

More and more contractors are using Ryerson reinforcing service because Ryerson handles the complete job from setting plans to delivery with speed and accuracy. Bars are cut, bent and correctly tagged for easy placement. Ryerson deliveries are completely flexible to the changing needs of the job schedule.

If you have been unable to secure reinforcing from Ryerson stocks during the present steel shortage we suggest you try again. You will be pleased with the time and trouble saving advantages of Ryerson service. And remember Ryerson stocks of the unique Hi-Bond bar when planning new construction.

In addition to Hi-Bond, Ryerson stocks include a broad range of other construction steels—structurals, plates, steel spirals, reinforcing accessories, forms for concrete joist construction, bolts, rivets, etc. Write for Stock List.

Joseph T. Ryerson & Son, Inc. Steel-Service Plants at: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.

RYERSON STEEL

Civilian employment is at an alltime peak with more than 58 million people gainfully employed. Here metal finishers work on bodies of 1947 model cars at the Willow Run plant of Kaiser-Frazer Corp.

Steel Priorities To Be Limited

Civilian Production Administration assures steel producers preference assistance in ordering will be restricted to list of critical needs requiring but small percentage of 14,500,000-ton estimated fourth quarter production

WITH industrial production continuing to push toward higher levels in the face of persistent material shortages of all kinds, and with civilian employment at a new all-time high mark, the Civilian Production Administration last week promised to avert a threatened breakdown in steel distribution resulting from the piling up of priority certifications.

Steel manufacturers in recent weeks have become alarmed at the increase in priority orders, though to date only a portion of total production has been affected under priority demand. However, the tonnage involved has been increasing and has been sufficiently large to interfere seriously with orderly distribution. Fears have been expressed in some quarters lately that unless a halt on priorities is called, a demoralized market will develop similar to that at the beginning of the war prior to adoption of the Controlled Materials Plan.

To insure even distribution to all manufacturers, priorities assistance on steel during the fourth quarter will be confined mainly to a restricted list of critical items required for the veterans housing program and a few other urgent needs such as farm implements, John C. Houston, deputy administrator, Civilian Production Administration, told members of the General Sheet Steel Industry Advisory Committee last week.

Mr. Houston said these priority needs would not require more than a small percentage of the estimated 14,500,000-ton fourth quarter steel production, with the heaviest demands in lighter gage sheets, particularly galvanized. On the West Coast, however, rated tonnage may account for a considerable portion of total output, he said, but in any event will be limited to not more than 50 per cent.

He stated that investigation of applications received since reinstitution of assistance under Priorities Regulation 28, the bottleneck breaker, showed that most applicants were receiving adequate amounts of steel at present, but were asking for priorities as an "insurance policy" for future deliveries and he indicated most of the requests already received would be denied.

The new policy was outlined to the committee in response to the complaint that CPA's priorities and directives for fourth quarter deliveries were increasing at an alarming rate. Some industry members protested the relatively large priorities orders which they said they were receiving on housing requirements. One committee member said newcomers in the field were the greatest offenders, old-line customers' orders holding close to prewar historical pattern.

CPA officials said there may be a few instances where an error in judgment has been made but that overall allocations for housing requirements have been tailored to meet actual needs. Agency officials also emphasized that CPA did not take manufacturers' statements at face value, but were carefully investigating before granting such priorities.

Galvanized steel deliveries for housing needs in particular may be hampered, the committee said, because of a shortage of proper qualities of zinc. CPA pointed out that it had made the 140,000-ton government zinc stockpile available for

industry's needs. However, committee members said that galvanizing requirements were for the prime western grade, while most of the zinc in the government stockpile was mostly of the high grade type.

The committee reported it had only one month's supply of prime western on hand but this supply could be stretched out by mixing this type with the type of zinc in government stocks. The industry reported that the galvanizing situation would become acute within the next two months unless the zinc supply situation was alleviated. CPA officials stated that the needs for the housing program would amount to about 15 per cent of total supply, and felt that these could be met without too serious impact on other consumers.

Discussing the overall priority situation, CPA informed the committee that all applications received by the Steel Branch to date, both their Regulation 28 and others, would be reviewed in light of their effect on the overall steel distribution picture. Priorities granted for all purposes would be held to a level where they will not seriously disturb steel production schedules and other consumers, CPA said.

Priority Action Taken To Speed Veterans' Housing

Drastic action was taken last week to speed construction of homes for veterans. Chief among moves filed was the placing under priority control of virtually every scarce item which goes into a house and the directing that the greatest proportion of each material be "set aside" indefinitely for home builders with priority rated orders.

Continuing shortages in certain key building materials had an adverse affect on home building in July.

Actions taken last week to channel more materials into veterans housing included:

1. Reserving from 75 to 100 per cent of each scarce building material for priority holders, such reserves to be held indefinitely.

2. The addition of 28 such scarce building items to the list under priority control, bringing the total to 58.

3. Stricter compliance will be obtained through inspection of sales of building materials, and provisions requiring distributors to keep complete records of such sales.

4. A reduction in the permitted weekly volume of non-housing construction from the current figure of $48.8 million toward a goal of $35 million.

There are two new orders involving cast iron soil pipe. One provides that at least 93 per cent of the output must be in sizes needed for housing and the other that no one shall use the product for any purpose except installing, repairing or maintaining sewage disposal systems in buildings and that it shall not be used beyond five feet from the building line except for replacements.

The 58 materials now on the priority list (Schedule A to Civilian Production Administration Priorities Regulation 33) follow: Hardwood flooring; lumber, housing construction as defined in Direction 1 to PR 33; millwork; softwood plywood; brick, common and face, clay; concrete block and brick; portland cement; tile, common and face, structural; clay sewer pipe; cable, metallic or nonmetallic sheathed; some lighting fixtures; raceways (including rigid and flexible conduit, thin-wall metallic tubing, surface metal raceways) and fittings; some wiring devices; some builders hardware; nails; building board; gypsum board; gypsum lath; plaster, hardwall; plaster base (metal lath and accessories); shingles (asbestos-cement, asphalt, slate, wood); siding (asbestos-cement); stucco mesh (woven or welded wire); bathtubs; boilers, low pressure, for heating and hot water; controls, temperature and combustion, for heating and hot water; furnaces, floor, wall; furnaces, warm air; kitchen sinks (including sink-and-tray combinations and undersink cabinets); lavatories; oil burners, domestic; plumbing fixture fittings and trim, including brass tubular goods; pipe, bituminized fiber, for drains and sewers; pipe, cast iron soil pipe and fittings; pipe, steel and wrought iron, including galvanized, in sizes ⅜-inch to 4 inches inclusive in diameter, and related nipples and threaded fittings; radiation, convector and cast iron, including accompanying metal enclosures and grilles; range boilers; registers and grilles for heating systems; stokers, domestic; stoves and ranges for cooking and heating, including space heaters; tanks, septic; tanks, oil and water storage, capacity 550 gallons or less; water closets (1-piece combinations, bowls, tanks); water heaters; copper water tubing; prefabricated houses, sections, and panels; doors and frames (metal); joists (steel); fabricated structural shapes (steel, aluminum); structural shapes (steel, aluminum) cut to size by a warehouse for a housing contractor; cabinets, metal built-in types for kitchens and bathrooms; floor coverings of the following types; feltbase, linoleum, mastic, tile (asphalt, rubber), gutters and downspouts; insect screen cloth (metal, plastic); caulking lead; finishing lime; weatherstripping (metal); fabricated reinforcing rod and mesh.

GM Head Fears New Strike Wave

"The stage is getting set" for a new wave of strikes which will further imperil the national economy.

This opinion was offered last week by C. E. Wilson, General Motors president, who pointed out that the industry probably will follow whatever pattern is established in the coming Chrysler contract negotiations.

The GM president blamed the Truman administration for the automotive industry's failure to reach its planned rates of production.

"I think," he said, "if you want to be real frank, it is the government's fault. They are the ones who encouraged the big international unions. They made about three very bum forecasts."

Mr. Wilson accused the administration of changing its wage-price policy three times since V-J Day, and contended that if the country had a policy and stuck to it some order would begin to emerge from the present situation.

C. E. WILSON

Barring new strikes, Mr. Wilson said his company would increase output by 20 per cent in September and another 20 per cent in October, after which output would level off. Under favorable circumstances, a peak production could be reached by the beginning of 1948. Mr. Wilson said he believed that if everyone went back to work the auto industry could sell 6 million cars a year for several years.

Industry Soon Can Draw on Full Pipelines of Materials, CPA Says

INDUSTRY soon will be able to draw on full pipelines of materials and parts, according to John D. Small, Civilian Production administrator.

In releasing his monthly report on civilian production for July, he said, "The stop-and-go output of materials and parts which has been obstructing volume manufacturing has now been replaced by continuous, high-level production. That means that industry is within sight of full production of finished goods if industrial peace continues."

Outstanding in the generally bright picture of consumer durable goods shipments, Mr. Small said, were July gains of 56 per cent over June in passenger automobile output and 58 per cent in trucks. Along with the 220,000 passenger cars and 93,000 trucks that rolled off assembly lines in July, production of sewing machines jumped 30 per cent to 35,000, and electric ranges rose 24 per per cent to 57,000.

July output of other important consumers' durable goods follows: Passenger car tires, 5,100,000; truck and bus tires, 1,100,000; refrigerators, 220,000; washing machines, 187,000; radios, 1,329,000; vacuum cleaners, 197,000; gas ranges, 127,000; and electric irons, 502,000.

Output Seen Near Peak Level

Mr. Small's report estimated overall economic activity during the second quarter of 1946 at an annual rate of $130 billion, a 17 per cent increase over 1941. CPA economists look for the third quarter to come within 5 per cent of the all-time peak of $142 billion reached in the second quarter of 1945.

Civilian employment, Mr. Small's report said, reached in July an unprecedented 58,100,000, four million higher than the wartime level of a year ago. The report pointed out that all of the 1,400,000 increase over June was in non-agricultural employment. Three hundred thousand more men left the ranks of the jobless in July, as unemployment declined to 2,300,000.

July production of 6.6 million tons of steel ingots was the highest thus far this year, Mr. Small pointed out. "With continued steel ingot operations at 90 per cent of capacity, demand for iron and steel castings should be more easily met during the fourth quarter. However, July shipments of finished steel products will not exceed June because of the regular July vacation period, usual hot weather slump, and the freight car shortage," the report added.

Steel Resellers Warned by OPA on Delivered Prices

Resellers' maximum delivered prices for iron or steel products must be figured on the basis of the buyer's destination, the Office of Price Administration reminded the trade last week.

Evasion or violation of the provisions of RPS 49 requiring calculation of prices at "destination" is subject to prosecution, OPA said. Some sellers have been figuring ceiling prices on the basis of a "destination" other than the place where the buyer's operation is to be performed.

Only in certain specified instances, OPA pointed out, is it permissible for the destination to be established at a place other than where the buyer's operation is to be performed. These are as follows:

(1) When delivery is for consolidation with other material owned by the buyer and for subsequent shipment to some other point, but only when the total delivered cost of iron or steel products purchased does not exceed the maximum delivered price at the true destination

(2) When the true destination of the shipment is a military secret.

(3) When delivery is made at the public carrier's terminal nearest to the true destination if it was customary for the buyer to accept delivery of material at such point when making purchases of iron or steel products from warehouses on or prior to Apr. 16, 1941.

Regarding the practice of selling f.o.b. warehouse, OPA stated a seller may do so provided the total cost to the buyer at his destination does not exceed the destination price otherwise established by the schedule.

Present, Past and Pending

■ U. S. RUBBER TO TRIPLE GRINDING WHEEL PRODUCTION

FT. WAYNE, IND.—United States Rubber Co. plans to triple production of high-speed grinding wheels at a plant here recently acquired from the government. It also plans to turn out other products at the plant including automotive rubber parts, engine mountings, etc.

■ ALLEGHENY LUDLUM TO AID STAINLESS STEEL USERS

PITTSBURGH—Consolidation of sales development and engineering service divisions of the Allegheny Ludlum Steel Corp. is being effected, functions of the new department being to co-ordinate and extend the company's co-operation with users and fabricators of stainless steel.

■ EMPLOYMENT ROLLS GAIN THROUGH PLANT CONVERSIONS

WASHINGTON—Peacetime employment rolls have been increased through conversion of surplus war plants to civilian production, according to the War Assets Administration, which reports that in the period April 1 through Aug. 31, 164 properties out of more than 300 disposed of to private buyers provided employment for 143,400 persons.

■ PULLMAN-STANDARD DELIVERS 152 LUXURY CARS

NEW YORK—Pullman-Standard Car Mfg. Co. last week made delivery of 152 postwar, stainless steel luxury passenger coaches to the New York Central System, the largest number of new passenger cars delivered to a railroad in a single year.

■ COPPER MARKET EASED THROUGH STRIKE SETTLEMENT

NEW YORK—Settlement of the strike of skilled workers in important Northern Rhodesia copper mines after a shutdown of 60 days is expected to materially ease the tight situation in the copper market.

■ T. C. & I. MODERNIZATION PROGRAM ANNOUNCED

BIRMINGHAM—New construction program at Fairfield sheet mill of Tennessee Coal, Iron & Railroad Co., U. S. Steel subsidiary, announced last week, includes installation of a 54-inch, 4-high, 4-stand cold reduction mill; 48-inch continuous pickling and cleaning lines; two continuous galvanizing lines; and annealing and shearing facilities. Main objective is to modernize facilities for sheet production through conversion of hot-rolled method to cold-reduced method, and also, to produce galvanized sheet metal in coils.

■ TIN MILL ALLOCATIONS CURTAILED BY CPA

WASHINGTON—Civilian Production Administration last week curtailed tin mill allocations for essential food cans and other perishables from the previous 85 per cent of total tin mill output to 70 per cent, effective Sept. 30.

Discount Coal Nationalization Fears

Parley of miners and operators expected to be long and stormy but eventually to result in agreement

ADMIRAL BEN MOREELL

WASHINGTON

FEARS that a deadlock will develop at the coming coal conference which might result in early nationalization of the coal industry do not meet with much credence in informed circles in Washington.

Conversations with a number of men directly concerned with the conference, which starts Sept. 10 in the Interior Auditorium here, indicate they are expecting long and stormy negotiations but that they are confident the miners and operators finally will come to terms.

Certainly John L. Lewis will come to the conference as warm an advocate as ever of the American free enterprise system. In convention after convention the United Mine Workers have affirmed and reaffirmed opposition to government ownership or nationalization of the coal mines in any form. Mr. Lewis consistently has warned his people that "the interests of both operators and miners can be served to the better advantage of all concerned under private enterprise than by bureaucracy, which eventually would regiment the men employed and destroy private initiative."

Private Business Preferred

There is another, more personal reason. Like all labor leaders, the man with the bushy eyebrows prefers to deal with private business rather than with the government. When Mr. Lewis deals with the operators he can rage and rant and hurl insults into their teeth—and the newspapers enhance his prestige by devoting many columns to his goings-on. It is different when he deals with the representatives of the people of the United States. To deprive him of the operators would be like taking Harvard and Princeton away from Yale.

Some of the coal operators have favored unloading their mines on the government but that was in times of depressed demand and big losses. Operators do not talk about nationalizing the mines when times are good. Today there is a great demand, ceiling prices are the rule, and profits generally are satisfactory. There is no real sentiment among operators in favor of permanent government ownership and operation.

And if there is any ideologic support for coal mine nationalization in the government, it has been well concealed. All evidence indicates the government wants to get out of the coal business as soon as possible. In calling operators and miners to the conference, Adm. Ben Moreell, the federal coal mines administrator, makes only one stipulation: The contract with which the operators and miners emerge must assure uninterrupted production of coal after the mines have been returned to their owners.

What new demands may be uncovered in the conference? To this question there is no reliable answer. If Mr. Lewis follows his usual custom he will ask for a lot of things, but he is not in the habit of tipping off his hand in advance. He may ask for still higher wage rates to take care of the rise in living costs since he signed his contract with the government in May. But this is not certain; in fact there has been fairly general satisfaction in the UMW over current wage rates. Too, the feeling of elation over establishment of a Welfare and Retirement Fund supported by tonnage payments has not yet subsided.

Main bone of contention probably will be the issue of unionization of mine foremen and supervisors. Chances are that both miners and operators will agree to wait and see what the courts decide. The miners are quite optimistic over their chances of getting court clearance.

The issue is bound up in two cases, both involving Jones & Laughlin Steel Corp. One is pending now in the Court of Appeals, District of Columbia, with hearings to start early in October. In this action J & L questions the authority of Admiral Moreell to recognize a UMW affiliate as bargaining agency for the foremen.

The other case is in process of development. It involves the refusal of J & L to deal with the union as bargaining agent for the supervisors and foremen. This case will go to one of the appeals courts and eventually to the Supreme Court. Two main questions are involved. One is whether supervisors, as representatives of management, may organize for collective bargaining. That is, the highest court would be called on to review the decision of the Sixth Circuit Court of Appeals, Cincinnati, which recognized the right of Packard Motor Car Co. foremen to organize. The other question is, if foreman may organize for collective bargaining purposes, whether it is proper for them to become affiliated with the union to which the miners under them belong.

In addition to the issue over unioniza-

tion of supervisors a controversy is expected to develop over the Bureau of Mines safety code which operators contend is too drastic and costly and which they also find objectionable because the code gives the union more voice in the operation of the mines than the operators believe is desirable.

Another matter which may cause trouble is the setting up of a permanent organization to handle the Welfare and Retirement Fund which now is accumulating more than $2 million monthly.

Still another obstacle to be hurdled is the establishment of a system for adjusting wages and hours of work.

The most recent issue of the "United Mine Workers Journal" contains a violent attack on southern operators, alleging they are not disposed to bargain with miners but instead pin their hopes on enactment of legislation "that would destroy free collective bargaining by means of a straitjacket that would penalize labor at every turn."

Coke Production Rises to Two-Year High in July

Production of coke in the United States increased in July to 5,776,025 net tons, the largest total since July, 1945, and an increase of 20.7 per cent over June, according to the Bureau of Mines.

Responding to the heavy demands for coke by all classes of consumers, average daily output of by-product and beehive coke increased more than 16 and 20 per cent, respectively. The accelerated rate of production in the by-product industry was shared by both furnace and merchant plants.

A compilation of the disposal of by-product and beehive coke by principal end uses for July reveals that the wartime pattern of disposal has changed very little and deliveries to blast furnaces accounted for about 79 per cent of the total sold or used; to iron foundries 5 per cent; for other industrial purposes 8 per cent; and for domestic heating 7 per cent.

Stocks of by-product coke at producers' plants at the end of the month were 15 per cent above those of June 30 and were equivalent to 4.1 days' production at the July rate. Coking coal stocks at by-product coke plants at the end of July showed a slight improvement over June and were sufficient for 16 days' supply at the July rate of consumption but were still far below the reserves normally carried by producers.

The by-product coke plant at Morgantown, W. Va., has been purchased by the Sharon Steel Corp. and was placed in operation in July, raising the number of active plants to 85.

Premiums of $8 Per Ton Proposed To Boost Merchant Iron Output

Housing Expediter Wyatt suggests plan at industry committee meeting. Only foundry and malleable grades would be affected. Possibility of encouraging reopening of idle blast furnaces also discussed

WASHINGTON

PLAN to boost production of merchant pig iron by about 25 per cent through premium payments of $8 a ton on output in excess of established quotas was proposed by National Housing Expediter Wilson W. Wyatt to the Merchant Pig Iron Industry Committee last week. The plan is awaiting discussion with labor representatives before final drafting.

Whatever the provisions of the final regulation, it was agreed the plan would be effective as of Sept. 1, 1946, and Expediter Wyatt emphasized that all excess production from that date on would be eligible for the premium payments.

Merchant pig iron covered by the program would be foundry and malleable grades and would not apply to basic, bessemer, high silicon and low phosphorus grades.

Opposition to the proposed merchant pig iron subsidy was expressed by the Steel Labor Advisory Committee meeting with CPA and National Housing Administration representatives.

Use of Idle Furnaces Urged

The labor representatives claim overall pig iron inventories held by steel mills exceed the amounts being reported to CPA and want increased pressure for more scrap. Also they ask that the government blow in all idle DPC blast furnaces.

The labor committee attacked the proposed subsidy as offering a windfall for steel mills with no gain in production of housing materials, and expressed concern that the subsidy would divert iron from steel requirements into "more profitable" castings production, with no gain in overall output.

Possibilities of encouraging the reopening of closed pig iron plants and adding new plants to the industry, also was discussed at the meeting. A closed plant would be defined as one in which no blast furnaces were in operation at any time between Jan. 1 and Sept. 1, 1946, and a new plant as one operating for the first time after Sept. 1. An operating plant is one in which one or more blast furnaces produced pig iron or any other product at any time between Jan. 1 and Sept. 1.

To determine its quota under the plan as proposed, an operating plant would take 80 per cent of its highest month's production during the first eight months of this year, or the average of its three highest months' production, whichever is lower. However, because the industry operates continuously, the entire computation would be figured on a daily basis.

The 80 per cent quota figure is somewhat higher than the average monthly production so far this year, and is higher than government estimates for production during the rest of this year without the premium payments plan.

Termination date of the premium payments plan would be June 30, 1947, with provision for review of the plan next March to determine at that time if it should be extended.

Cast Iron Soil Pipemakers May Get Financial Relief

Two amendments to Premium Payments Regulation No. 8 of importance to producers of cast iron soil pipe are being drawn up, it was announced last week by the Office of the Housing Expediter.

One amendment would provide financial relief to cast iron soil pipe producers who must buy pig iron from companies which, because of unusual production costs, have received special permission from OPA to sell their pig iron at prices higher than those prevailing in the region. Cast iron soil pipe producers who buy their pig iron from such companies could qualify for an additional premium payment which would offset this higher cost of pig iron.

The second proposed amendment would adjust quotas downward in extreme hardship cases during the period required by manufacturers to convert to production of smaller sizes of pipe, the sizes needed for housing. Veterans Housing Program Order 4, effective Sept. 1, restricts production of cast iron soil pipe of sizes 5 inches and larger to 7 per cent of total tonnage of all sizes made during the preceding month.

Both amendments would be retroactive to Sept. 1.

Economy Move Delays Delivery Of Six Ships

Construction of 11 other Navy vessels in six private yards will continue but at a somewhat slower pace

AS AN ECONOMY measure, delivery of six ships now being built in four naval shipyards will be delayed for a year, the Navy Department has announced.

In addition, construction of 11 ships building in six private yards will continue but at a somewhat slower pace, and the hull work of the 27,000-ton battle cruiser *Hawaii* will be delayed to avoid unnecessary costs while changes are being developed in design. However, the New York Shipbuilding Corp., at Camden, N. J., has been authorized to complete the *Hawaii's* main propulsion plant, install electric power and lighting facilities in the machinery spaces, and continue other work that will protect the investment in the vessel.

The Navy said that since 23 of the remaining 24 ships of a total of 41 under construction on Aug. 1 were scheduled for completion by Dec. 1, any delays now would only result in increased costs to the government. Therefore, they will be completed in accordance with the original schedule.

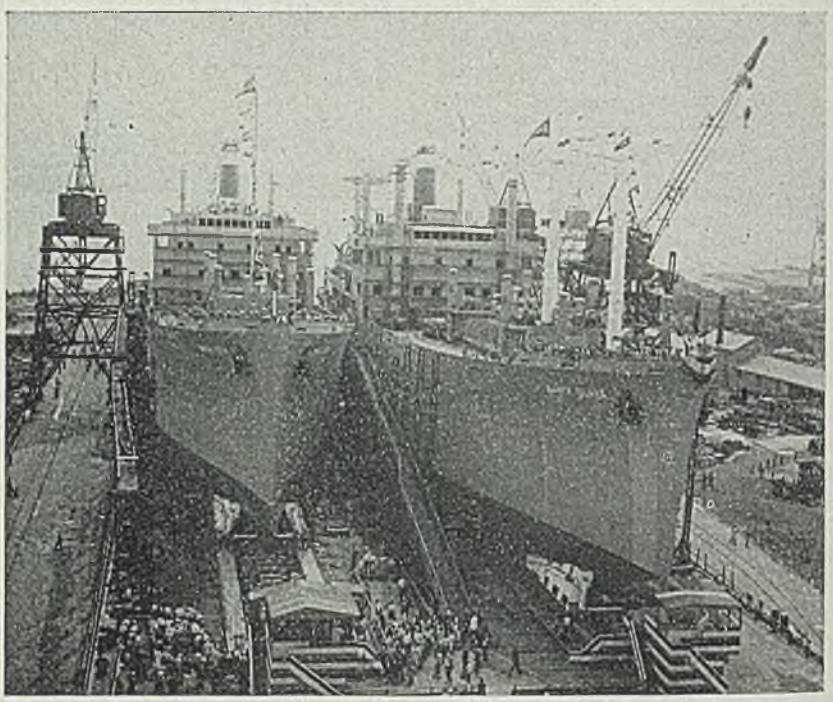
Six Ships Delayed

The six ships on which delivery is to be delayed are the 27,000-ton carrier *Oriskany* at the New York yard; the destroyer tender *Bryce Canyon*, at Charleston; the destroyer escorts *Wagner* and *Vandivier* and a landing ship tank, at Boston; and the battleship *Kentucky*, at the Norfolk Naval shipyard.

Vice Admiral E. L. Cochrane, chief of the Bureau of Ships, said all the naval shipyards affected were assured of sufficient repair work to permit them to retain reasonably strong nucleus crews of civilian workmen.

However, Admiral Cochrane said the prospect of continued and stable employment at the private shipyards is not bright. A number of big private yards upon which the Navy depended accepted practically no commercial or Maritime Commission contracts and now find themselves with virtually no backlog of construction or repair work.

Because of this situation the Navy decided to continue construction in the private yards at a somewhat slower pace.



TWIN LAUNCHING: Two passenger-cargo liners, built by Federal Shipbuilding & Dry Dock Co., are launched at the company's Kearny, N. J., yard. Already part way down the launching way on the left is the *Santa Sofia*. On the right awaiting christening is the sister ship *Santa Clara*. Each is of 13,907 tons displacement, will accommodate 52 passengers and have cargo carrying capacity of 8800 deadweight tons. They will be placed in service between New York and Caribbean ports by the Grace Line

Civilian Employment Reported at Alltime High Mark of 58,130,000 During July

WITH July civilian employment reported at an alltime high of 58,130,000 and unemployment down to 2,270,000 (not including 1,800,000 veterans drawing government jobless compensation), predictions are being made that when the figures are in for August the job total will range between 58,500,000 and 59 million.

Government economists are basing their predictions of further employment increase on reported indications that in the last half of July and in early August the number of unemployment compensation beneficiaries declined. Also evidence was at hand to indicate continued expansion of industrial production, while surveys by the U. S. Employment Service indicated increased employment prospects in 82 out of 95 important labor market areas.

Secretary of Commerce Wallace, however, strikes a warning note in discussing the employment figures, cautioning that the present situation is abnormal, that, in his opinion, the country is entering an "inflationary boom" which will give way to a drop in employment.

Generally speaking, government experts expect the late fall will show a drop in the employment total unless developments contrary to the seasonal trend develop. Right now the total is rapidly approaching the 60 million figure set by Secretary Wallace as a postwar employment goal to be achieved by 1950. Observers point out that if the 3 million persons in the armed services are added to the civilian employment total for July the overall figure on employment would be over Wallace's goal.

Nelson Blames High Army Men for Reconversion Lag

That postwar reconversion difficulties are traceable to wartime efforts of high Army leaders to dominate the civilian economy and their refusal to permit any concrete planning for peace, is the charge made by Donald M. Nelson, former chief of the War Production Board, in his book "Arsenal of Democracy," published by Harcourt, Brace & Co.

Mr. Nelson asserts in the book that

these high officers blocked his efforts to start a gradual changeover from military to civilian production, even after the main war manufacturing problem was solved. Certain Army men, not named in the book, deliberately spread the impression that munitions shortages on the European front in the summer of 1944 were caused by production lags, while actually the fault was in the Army's supply services which failed to deliver the munitions by the time they were needed, he said.

The former war production chief warns that the nation's economic and social system will be in peril if it is controlled by the military.

Mr. Nelson, who is president of the Society of Independent Motion Picture Producers, at present is engaged, at request of President Truman, in planning a permanent chain of standby munitions plants.

Primary and Scrap Lead Prices To Hold, Says OPA

No increase in the current ceiling prices of lead or lead scrap is planned in the foreseeable future, Office of Price Administration said recently. At the same time, John D. Small, administrator, Civilian Production Administration, has advised OPA that his agency will move quickly to prevent the accumulation of excessive inventories of lead.

"Since the premium price plan takes care of the mining of lead, and since the Reconstruction Finance Corp. is buying obtainable foreign lead and reselling it here at the domestic ceiling," declared Paul Porter, OPA administrator, "there is no sound reason for a further increase in lead ceiling prices.

"There has been, however, serious withholding of lead on the mistaken belief that ceiling prices would be raised. Although in the case of lead, a number of sales were made during the interim at a price of 9.5 cents per pound as compared to the ceiling of 8.25 cents per pound, this does not justify an increase in the ceiling. It previouly had been made clear that no 'bail out' would be provided for those who bought at over-ceiling prices during the interim," the OPA administrator said.

Vacuum Cleaner Shipments During July Total 192,655

July shipments of household vacuum cleaners totaled 192,655, the Vacuum Cleaner Manufacturers' Association, Cleveland, reported. In June, shipments totaled 161,631, and in July, 1941, they were 155,843.

CPA Urges Freight Car Builders' Steel Needs Be Served Promptly

Serious transportation delays spur efforts to complete 40,000 new freight cars for domestic use by end of year. An estimated 80,000 cars currently out of service awaiting repair. Shipping peak expected in October

STEEL industry has been requested by the Civilian Production Administration to give prompt consideration to the needs of freight car builders because industry is faced with insufficient freight cars to handle the increasing flow of reconversion goods, with a seasonal peak approaching in October.

Completion of 40,000 new cars for domestic use by the end of the year must be hastened to prevent further serious transportation delays, according to John D. Small, administrator.

CPA has been channeling steel and pig iron to brake shoe foundries to avert a shortage of these items, which are especially critical. It is expected that further measures under consideration for increasing pig iron production will help to alleviate the present acute shortage of castings for railroad and other urgent needs.

An estimated 80,000 cars are out of service awaiting repair, twice as many as during the war. The car shortage is menacing the movement of several commodities, including metallurgical coal for gray and malleable iron castings, Mr. Small said. In the Chicago area, finished steel products are not being moved fast enough, forcing some mills and blast furnaces to close down.

Carloadings at Wartime Levels

Since the middle of July, weekly carloadings of revenue freight have equalled wartime peak levels. But CPA expects to see even more goods shipped during the third and fourth quarters of 1946, and for an indefinite period thereafter.

"The demand for freight car capacity reflects a healthy condition of high production in important areas of the economy, such as coal, steel, building materials, lumber, grain and livestock," Mr. Small said. "But until we get more cars into service or more use out of the cars we now have, the country's potential rate of output will be held down because of sluggish circulation of basic products and materials."

The railroads estimate that they are short 100,000 freight cars. July production of just under 4000 cars was down almost 25 per cent from April output, principally because of insufficient supplies of steel. Earlier, CPA had hoped for a rate of 8000 cars a month by July. Car builders at the end of July had 53,000 cars on order for domestic use and 43,000 on order for export.

Materials Shortage Closes Big Car Building Plant

MICHIGAN CITY, IND.

Further evidence of the crisis in the railroad freight-car situation, occasioned by inability of railroad equipment manufacturers to get sufficient steel and other essential materials to produce the thousands of new cars urgently needed by the railroads, was seen last week in the virtual closing of the Pullman-Standard Car Mfg. Co.'s plant here from Sept. 3 to 16.

According to Arthur A. Logmann, manager of the local works, the shutdown means temporary idleness for approximately 600 of the factory's 1100 workers. Those retained on the job will be employed either on plant maintenance projects or in fabricating whatever parts for future orders that can be produced from the small stocks of raw materials available.

The shutdown, coming when the entire economy of the country is being seriously thrown off balance by the rapidly mounting lack of sufficient freight cars to fill current railroad needs, is the third experienced by the local plant in less than five months. The previous two, also caused by lack of supplies, resulted in a total loss of 28 working days. Since Apr. 4 the plant, because of inability to get the materials to keep going, has found its operations cut to less than one-third of its 54-cars-a-day capacity.

Originally, Sept. 3, which marked the start of two more weeks of lost production, had been set for the beginning of work on an order of 750 box cars for the Santa Fe, Mr. Logmann disclosed. Instead, he now states, the earliest they can get under way will be Sept. 16 and then only if essential materials expected in the interim actually arrive on the scene. Following these 750 cars, and scheduled to start in November, are 1350 refrigerator cars, of which 350 are for the Santa Fe and 1000 for the Pacific Fruit Express Co.

Surplus Machine Tool Disposal Plan Reported Working Out Well

Nearly 3000 approved machinery dealers, acting as sales representatives for the government, since Jan. 1 have sold more than $100 million worth of equipment. Sales have returned about 50 per cent of original cost

GOVERNMENT'S "approved dealer plan" for the disposal of more than $1 billion worth (new cost) of surplus machine tools and production equipment is meeting with remarkable success, according to the War Assets Administration.

Under this plan, nearly 3000 dealers are acting as sales representatives for the government in an effort to speed up the channeling of surplus machinery from government-owned plants and warehouses into productive manufacturing uses.

Since Jan. 1, these dealers have sold more than $100 million worth of equipment and the rate of sales is increasing. Sales to date have returned about 50 per cent of the original cost. About $1 billion worth of machine tools and production equipment has been declared surplus by the Army, Navy and other government agencies which owned them and turned them over to WAA for disposal. No one knows exactly how much more machinery will be declared surplus, but it is thought likely that another $500 million worth may be handed to WAA to sell.

The machinery sold through approved dealers includes lathes, milling machines, heat-treating furnaces, welding equipment, planers, shapers, conveyors, cranes, derricks and a wide variety of machine tools and industrial equipment that are in long supply.

Most of this surplus is in government warehouses, or is in war plants that have been declared surplus. In some instances, the machinery will be sold with the plants, but if a buyer purchases only the plant, the approved dealers have a chance to locate buyers. In some cases, plants can use the tools and equipment just as they are for civilian production. In other cases, the equipment can be converted readily to a new use. Sometimes no civilian use can be found for some specialized machine and the government disposes of it for salvage and scrap.

July Machine Tool Shipments Drop to New Low for Year

Estimated total shipments of machine tools in July were at a new low for thi year, according to the National Machin Tool Builders Association, Clevelan At $22,350,000 the July shipments were $6,230,000 below June and $4,230,000 under May, the previous low month of the year.

New orders in July were down 7 per cent from June, cancellations were half again as high as in June, and unfilled orders were up by less than 1 per cent.

Plans Discussed for Disposing Of Resistance Welders

War Assets Administration officials, meeting with the Resistance Welder Manufacturers Advisory Committee recently on plans for speeding disposal of surplus resistance welder machines, spare parts and control equipment, advised the industry that more than 1900 of the welders, which cost $10 million new, have been turned over to 14 regional offices for disposal and that more such equipment will be declared surplus.

Manufacturers' representatives declared the manufacturers are in the best position to sell it to private industry, and they advised that disposal could be accomplished rapidly, but they declared that WAA must allow sufficient profit to make the disposal worth the manufacturer's while.

The committee recommended a wholesale price be established for the manufacturers, in order that they might purchase the equipment at a mark-down, recondition it, and sell it with a guarantee.

Co-operation of the industry was pledged to help WAA obtain pertinent information on each machine so that a catalog might be prepared listing the entire stock of surplus resistance welders.

The committee said the industry has an interest in wanting to see that the proper machine, in proper condition, goes into the proper plant in order that the customer may be satisfied with the equipment. Concern was expressed lest indiscriminate selling of the machines result in dissatisfaction among some users, to the detriment of the industry.

WAA was advised that many of the machines are highly specialized, such as for welding steel landing mats for combat airports, and have no peacetime uses. Such machines, it was urged, should not be scrapped but should be sold on a

NAVY TESTS HELICOPTERS: Helicopter Development Squadron Three of the Navy is putting "windmills" through their paces at Floyd Bennett Field, N. Y., in an attempt to find their greatest value to the Navy. Apparent uses now are air-sea rescue, gunfire observation, antisubmarine patrol and liaison work. This photo shows a "sea rescue" being demonstrated on land; a line from a power hoist on the helicopter is dropped to the "victim," who fastens the line to his life jacket and is pulled aboard the aircraft. NEA photo

sealed bid basis in order that their valuable component parts might be recovered.

The committee advised WAA that stocks of spare parts for the welders should be offered to the manufacturers of the parts, who have sales outlets through which they can dispose of them.

Deliveries Of Tools Improve In St. Louis District

St. Louis—Under a moderately slowing demand, deliveries of new machine tools are improving somewhat in this district. Most sheet metal equipment remains bad, with shipments of automatic screw machines 6 to 12 months late, depending on sizes. Lathes are available in 4 months and some standard milling machines 2 to 3 weeks.

Slackening demand is attributed to a belief manufacturing plants are nearing completion of their replacement programs. Much worn or obsolete equipment was replaced at a considerable number of surplus sales held in this area, but tool dealers believe the cream of standard machines from that source has been taken off and predict a leveling off of demand which may remain constant many months.

Important price changes are not foreseen, since no price bulge occurred when ceilings on heavy tools were removed.

Tool Builders Expect Buying To Pick up in Near Future

Cincinnati — Machine tool manufacturers here foresee quick resumption of domestic buying which showed tendency to falter due to seasonal influences just prior to the holiday. Financing problems are evidently delaying some of the anticipated foreign business which is less brisk than earlier in the year.

Japanese Tool Capacity To Be Held to 27,000 Units

Washington—Japanese will be left with an annual aggregate capacity for manufacturing 27,000 units of machine tools, after interim reparations selections have been made, according to a report of the Supreme Commander of Allied Forces in Japan (MacArthur).

This will make available about 50 per cent of Japanese machine tool capacity, it is said, representing about 20,000 installed tools in the selected plants, for reparations.

Production data indicate an output of 481 units in May, with 309 delivered, against new orders for 507 units.

OPA Suspends Price Control on 21 Additional Industrial Items

Annual output of products returned to free market estimated at $110 million. Materials affected include refractories, vitreous enamel frit and specified slags and pigments. Producers must file reports on price changes after June 29, 1946

SUSPENSION from price control of 21 more construction and industrial materials which are not considered essential to the needs of the Veterans' Emergency Housing Program was made effective Sept. 4 by the Office of Price Administration. This affects the production of an estimated $110 million worth of materials annually.

Most important is the inclusion of $25 million worth (in annual production) of refractories which had remained under control after $60 million worth of items had been suspended earlier.

Another important product suspended from price control is vitreous enamel frit, which is generally used in the enameling of iron, steel and clay products. About $15 million worth of this material is being produced annually.

Slags for commercial blast furnaces and for chemical, industrial, constructional and agricultural uses have been suspended, following previous suspension of slag used for railroad ballast. Annual production of the types of slag suspended in the latest action averages about $12 million. Lightweight aggregates are still under price control. Ground or pulverized limestone for chemical, cement and industrial uses, of which about $14 million worth is produced yearly, is also suspended.

Dry, flushed and pulp color pigments and cadmium pigments as well as ceramic colors and decorating compositions are also suspended. The value of these products is about $31 million a year.

A reporting provision, calling for the filing of reports showing price increases by manufacturers of construction materials, paint materials and refractories which have been suspended from price control, is also included in the action. Any price change over the June 29, 1946, ceiling must be reported at once to OPA and any subsequent price increase must be reported within 10 days after it has been effected. Items covered by the reporting provisions include, in part: Basic refractory brick; silica brick; ladle brick; refractory fire clay brick; new dolomite for furnace uses; fluxing limestone, for blast furnaces and open-hearth plants and for use in smelting copper, gold, lead and zinc, and for other metallurgical uses; vitreous enamel frit; high temperature mortars; hot tops; industrial sands; commercial blast furnace, chemical, industrial, agricultural and constructional slag but not light-weight aggregates.

GOVERNMENT CONTROL DIGEST

OFFICE OF PRICE ADMINISTRATION

Silver Flatware: Sterling silver flatware has been suspended from price control, effective Aug. 30. (SO-126; OPA-6749)

Electrical Coils, Windings: Manufacturers of copper electrical coils and windings permitted to increase maximum prices 1.10 cents for each 1-cent increase in the price of copper contained in these products. Resellers may raise prices the same percentage as their net invoiced costs are increased. (MPR-136; OPA-T-4939)

Silver: Following new quantity differential premiums for distributors and resellers of silver have been established, effective Aug. 23, in cents per troy ounce: 100,000 to 200,000 oz, 0.375; 25,000 to 100,000 oz, 0.5; 10,000 to 25,000 oz, 0.625; 5000 to 10,000 oz, 1; 2000 to 5000 oz, 1.5; and under 2000 oz, 2.5. Resellers of semifabricated articles may determine their maximum prices by adding to the total net cost of the article an amount determined by multiplying their net cost figure by their Mar. 31, 1946, percentage mark-up. (MPR-198; OPA-T-4946)

Mechanical Jacks: Resellers of heavy-duty mechanical jacks granted a percentage pass-through of the Mar. 27, 1946, increase in manufacturers' maximum prices to replace the dollar-and-cent pass-on previously permitted, effective Aug. 30. (MPR-136; OPA-T-4955)

Valves and Fittings: Interim price inceases, which OPA granted for certain low-pressure valves and fittings on Mar. 26, will continue indefinitely. (MPR-591; OPA-T-4960)

Metal Wheeled Goods: Manufacturers' ceiling prices increased 4.8 per cent on children's metal wheeled goods, such as tricycles, wagons, scooters, airplanes, trucks and automobiles, effective Aug. 30. Manufacturers may now increase their March, 1942, prices a total of 19.5 per cent. (MPR-188; OPA-6748)

Kitchenware: Manufacturers of cast iron and enamel kitchenware have been granted an extension from Sept. 1 to Oct. 1 in the time to reticket their products with new ceilings. (MPR-188; OPA-T-4980)

CIVILIAN PRODUCTION ADMINISTRATION

Lead: Refiners producing soft pig lead must obtain an authorization from CPA to dispose of any lead (not subject to CPA's 25 per cent set aside) which has not been sold by the 20th of the month. (M-38; CPA-LD-242)

Wiring Devices: Manufacturers of wiring devices specified in schedule 1 to priorities regulation No. 28 granted priorities assistance for iron castings and steel, based on CPA-4491 applications submitted by producers. (PR-28; CPA-LD-244)

Texas Makes Substantial Industrial Advances in First Postwar Year

Business activity index 89.3 per cent higher than 1935-39 base period. State boasts 33 per cent gain in manufacturing plant since 1941. Metalworking companies' expansion appears limited only by materials scarcity and construction difficulties

DALLAS

TEXAS' industrial progress in its first postwar year has far outstripped any other peacetime year and the volume of its manufacturing output is considerably higher than prewar.

The University of Texas Bureau of Business Research business activity index is 89.3 per cent above the 1935-39 base period.

Not only are established prewar industrial plants operating at far above their normal rates but many new concerns are contributing to the rapidly climbing manufacturing volume. This is especially true in the metal fabrication field, where expansion seems to be bounded only by the supply of materials and the construction of plant facilities.

More industrial establishments have been established in Texas during the past year than in any other 12-month period in the past, excepting the war years.

Twelve thousand manufacturing establishments are listed in the 1946 directory of Texas manufacturers published by the Texas Bureau of Business Research —3000 more than were listed in the bureau's 1941 directory, the last published prior to 1946.

Population Gains Reported

Population trends, which may be accepted as paralleling industrial development in Texas, bear out, along with other indexes, the upsurge of business and industrial gains generally in most parts of the state. Recent analysis by chambers of commerce of the two leading manufacturing centers, Dallas and Houston, indicate that present populations of the counties in which they are situated are 583,546 and 679,333, respectively. This represents a gain of 46.4 per cent for Dallas county in the 5-year period since 1940 and of 28.6 per cent for Harris county (Houston) since the last U. S. census.

Most other important indexes upon which development progress in this section is keyed closely parallel these trends. Building contract awards for instance in Dallas county for the first five months of 1946 totaled $54,680,000, according to F. W. Dodge Corp. reports, and Houston reports construction awards during the first half of this year as exceeding the record-breaking total of $41,087,844 for the entire year of 1945.

Metal fabricators and the metal working industries over the state generally are working at capacity limited only by the supply of materials, a spot survey indicates. Production is not hampered by any help shortage so far, though in a number of the small centers of the state it appears there would be insufficient skilled manpower to handle a greater supply of materials than is available in present limited quantities. This condition is not true in the large cities, where the manpower is sufficient to permit some weeding out of less efficient workers. The only labor difficulty has been at Houston, where late last week a 77-day building trades strike was ended after it stalemated approximately $100,000,000 worth of construction and produced a backlog of work that it is expected to take months to clear up. Construction supply houses felt the impact of the tieup severely.

The real pinch in materials supplies over the state is in steel.

As far as this section is concerned the only factor that warehousemen and distributors see as possibly an adverse influence to obtaining an equitable share of materials is freight absorption. Some point out that there are instances where shippers appear reluctant to give any preference to the southwestern area, particularly where there is any freight absorption involved.

The metalworking plants along the entire coast from Corpus Christi, Tex., to Lake Charles, La., are reported going strong, and like the other important larger centers, are ready for even more expanded operations as materials and new equipment are available. The outstanding development in that area is the announced plan of Sheffield Steel Corp. to double its capacity through its bid for acquisition of government-built properties at its Houston plant and the completion of its wire mill and warehousing facilities.

Simplification of Standard Galvanized Ware Proposed

National Bureau of Standards has submitted a proposed "Simplified Practice Recommendation for Standard Grade Galvanized Ware" to producers, distributors, and users for acceptance. This recommendation covers capacities or dimensions of hot-dipped and sheet-construction types of galvanized ware, including water pails, fire pails, well buckets, round and square tubs, baskets, coal hods, sprinklers, garbage and ash cans, garbage containers, and grain or feed measures.

Freighters being loaded at Galveston, one of Texas' busiest ports. NEA photo.

A SPECIAL REPORT TO INDUSTRY

Revealing the current situation in

MATERIALS

COMPONENTS

METALWORKING EQUIPMENT

Nearly 1000 users of materials, component parts and metalworking equipment report on current inventories—duplication of orders—deliveries promised by suppliers—limitations on purchases—equipment on order—new equipment purchases planned—orders canceled because of extended deliveries

Materials

- **Duplicate Orders**—Heaviest duplicate ordering is reported by consumers in galvanized sheets, aluminum products and copper wire and cable; Least duplication is in hot rolled carbon bars, welded and seamless tubing and aluminum ingot
- **Hot Rolled Carbon Bars**—58.9% of consuming plants have 30-90 days' supplies; 29.5% are promised deliveries within 90 days
- **Galvanized Sheets**—38.8% have less than 10 days' supplies; 46.7% can get deliveries in 6-12 months
- **Copper and Brass Mill Products**—42.6% have 10-30 days' supplies; 48.1% have supplies for 30 days or more
- **Aluminum Mill Products**—70% have supplies for 30 days or more

V-J DAY plus one year finds peacetime production of American industry still being limited by shortages of materials, components and in some cases of production equipment. Inventories of many materials and components are unbalanced. Deliveries are extended and uncertain.

This is confirmed by reports from nearly 1000 metalworking executives questioned by the editors of STEEL. At the same time, existence of a certain amount of "water" in order backlogs of suppliers is revealed, especially in such items as galvanized sheets and electric motors.

While the answers to the questions on the following pages will not in all cases check with individual experience, it should be pointed out that the companies reporting the information represent an adequate cross section of the metalworking industry, both as to size and diversification of operations.

Comments by metalworking executives answering the questions indicate three major causes for the shortages and unbalance in the supply of materials, components and equipment needed for hard goods production. These are: 1. Strikes and other work stoppages since V-J Day; 2. dislocations caused by price control policies; 3. the tremendous increases in metalworking capacity and in the demand for goods.

Most frequently mentioned cause for the shortages are postwar strikes. Not only did the stoppages in steel, copper, and coal cause heavy losses in the production of

primary metals, but hundreds of less publicized strikes have disrupted the flow of materials and components.

Policies of the Office of Price Administration are blamed for many shortages and for the lack of balance in supply. Rigid ceilings discouraged the production of some items. Companies which customarily make a number of products were forced to concentrate on those items on which a profit could be made, with the result that items on which ceilings were too low to allow a profit were neglected.

Metalworking capacity was increased tremendously during the war and postwar demand for goods has been much heavier than in prewar days. Thus shortages are apparent despite a high rate of production, compared with prewar levels.

In the first 12 months after the war ended, the steel industry produced 63.5 million tons of ingots, greater than the production for any full calendar year up to 1940. Yet demand for steel products has increased to an extent that what would have been a record production before 1940 is inadequate.

In materials, the study shows the items in shortest supply to be galvanized sheets, hot-rolled sheet and strip, cold-rolled sheets and strip, carbon bars, copper wire and cable and copper and brass mill products. The shortage, however, extends to practically all steel products with the exception of some alloy steels. Consumer inventories generally are low, considered in the light of the extended deliveries promised.

Practically all mills are sold out on practically all steel products for the remainder of 1946. Order books for 1947 generally have not been opened yet but producers are expected to start taking orders later this month for delivery next year.

Duplicate ordering for the same requirements is less than generally supposed, the study reveals, as indicated in accompanying chart. Although a number of companies admitted placing such duplicate orders, the percentage is low. This may be explained by the practice of mills in accepting orders only from regular customers, thus diminishing the chances of a customer placing the same order with four or five mills.

Many companies report they are buying all the materials they can obtain from any source. This is particularly true in those items which are most critically short.

However, the majority of companies are limiting purchases to 30-60 days' requirements, or, as several pointed out, "our suppliers are taking care of that."

Replies to the question, "What are the earliest delivery dates now promised by your regular suppliers?" offer an interesting study and in some cases answers vary considerably from the delivery picture presented by steel producers. A surprising number of companies report early delivery promises on some of the most critical products; this is explained by the fact they are warehouse customers or are receiving a regular allotment from the mills. On the other hand a number of plants report extended delivery promises, in 1947, on products for which the mills have not yet opened their books for 1947 business. Generally these are understood to be estimates of when the materials will be available.

Among the nonferrous metals, copper wire and cable and copper and brass mill products are in tight supply.

Current Consumer Inventories of Materials and Deliveries Promised by Suppliers

PRODUCTS	Question: What is your current inventory position on each of the products listed? Percentage of plants having supplies for: Less than 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.	6-12 mos.	Question: What are the earliest delivery dates now promised by your regular suppliers? Percentage of plants promised delivery in: than 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.	6-12 mos.	Over 12 mos.
H. R. Carbon Bars	8.4	26.2	43.9	15.0	6.5	...	7.1	5 9	7.1	9.4	28.2	36.5	5.8
H. R. Alloy Bars	9.4	26.4	28.3	30.2	5.7	...	9.8	7.3	22.0	14.6	31.7	14.6	
H. R. Sheets & Strip	16.2	33.3	39.4	10.1	1 0	...	5.2	5.2	7.8	10.4	31.2	31.2	9.0
C. R. Sheets & Strip	14.9	33.3	37.9	9.3	4.6	...	4.3	4.3	7.1	11.5	31.4	31.4	10.0
Galvanized Sheets	38.8	27.8	27.8	2.8	2.8	...	...	6.7	3.3	16.7	13.3	46.7	13.3
Plates, Structural Shapes	14.3	25.0	48.2	10.7		1.8	4.3	8.8	6.5	6.5	32.6	37.0	4.3
Manufacturers Wire	13.8	20.7	41.4	17.3	3.4	3.4	4.0	4.0	24.0	16.0	40.0	8.0	4.0
Welded and seamless Tubing	11.1	20.3	50.0	14.8	1.9	1.9	8.5	12.8	14.9	6.4	29.8	25.5	2.1
Stainless Sheets and Strip	28.6	38.0	23.8	4.8	4.8	...	5.5	16.7	22.2	5.5	38.9	11.2	
Pig Iron (foundry)	20.1	13.3	40.0	13.3	13.3	...		42.9	42.9	14.2	...	...	...
Brass Ingot	10.0	20.0	40.0	30.0	...	...	16.7	16.7	33.3	33.3	...	...	...
Aluminum Ingot	16.7	16.7	33.3	33.3	...	...	16.7	16.6	66.7	...	...	...	...
Copper and Brass Mill Products	9 3	42.6	31.4	16.7	...	...	2.4	7.1	14.3	15.7	31.0	23.7	4.8
Aluminum Products	13.3	16.7	53.3	16.7	...	...	4.3	13.1	17.4	21.8	17.4	21.7	4.3
Copper Wire and Cable	18.8	21.9	46.8	9.4	3.1	...	...	10.0	15.0	15.0	30.0	20 0	10.0

Aluminum ingot and brass ingot are easier while aluminum products are in fair supply, although tighter than ingots.

Despite the critically short supply on most steel items, only one consumer complains he is being forced to pay black market prices for steel. This consumer says he is paying an average of 6.8 cents a pound for sheets.

Several respondents express a yearning for the return of allocations. One railroad equipment manufacturer says: "While I do not like the priorities setup, yet I believe it is the only way that we could receive steel on a reliable schedule."

An Ohio manufacturer reports "a larger inventory than we should have" of hot and cold-rolled sheets and strip. He explains his company is unable to reschedule with supplying mills and consequently is accepting everything that is shipped, even though it is far in excess of normal inventory, in order not to lose its position on mill books.

"It seems to me," he says, "that it should be possible to set back material, and the mill should be willing to accept an order for a different size and the date of the order should be retroactive to the date of the order which was rescheduled."

POLICIES FOLLOWED BY CONSUMERS ON PURCHASES OF MATERIALS

Percentage Reporting "Yes"

Percentage Reporting "No"

	DUPLICATE ORDERS — Question: Have you placed duplicate orders for the same requirements with two or more suppliers?	SOURCES — Question: Are you buying all you can obtain from any source?	LIMITATIONS ON PURCHASES — Question: Are you limiting purchases to 30-60 days' requirements?
H.R. Carbon Bars	8.8% / 91.2%	45.2% / 54.8%	64.5% / 35.5%
H.R. Alloy Bars	9.4% / 90.6%	20.0% / 80.0%	76.1% / 23.9%
H.R. Sheets and Strip	13.3% / 86.7%	59.6% / 40.4%	64.8% / 35.2%
C.R. Sheets and Strip	11.5% / 98.5%	54.7% / 45.3%	63.9% / 36.1%
Galvanized Sheets	19.4% / 80.6%	51.6% / 48.4%	59.3% / 40.7%
Plates, Structural Shapes	10.3% / 89.7%	48.0% / 52.0%	70.0% / 30.0%
Manufacturers Wire	12.9% / 87.1%	34.5% / 65.5%	68.0% / 32.0%
Welded and Seamless Tubing	5.8% / 94.2%	24.0% / 76.0%	73.5% / 26.5%
Stainless Sheets and Strip	13.0% / 87.0%	43.5% / 56.5%	55.0% / 45.0%
Pig Iron (Foundry)	15.4% / 84.6%	30.0% / 70.0%	85.7% / 14.3%
Brass Ingot	11.1% / 88.9%	22.2% / 77.8%	100.0%
Copper and Brass Mill Products	9.1% / 90.9%	40.0% / 60.0%	68.3% / 31.7%
Aluminum Mill Products	17.9% / 82.1%	12.5% / 87.5%	77.3% / 22.7%
Copper Wire and Cable	16.1% / 83.9%	41.4% / 58.6%	66.7% / 33.3%
Aluminum Ingot	(None said "Yes")	(None said "Yes")	100.0%

Components

- **Bolts, Nuts and Rivets**—36.1% have less than 30 days' supplies; 27.7% have placed duplicate orders
- **Fractional HP Motors**—38.2% of users have less than 10 days' supplies; 54.5% promised deliveries 12 months or more ahead
- **Stampings**—29.3% have less than 10 days' supplies; big presses and small dies are bottlenecks
- **Forgings**—77.8% have inventories ranging from 30 days to 12 months; 30.1% are promised deliveries within 60 days
- **Ferrous Castings**—69.4% have inventories for 10 to 60 days; 53.5% are promised deliveries within 60 days
- **Die Castings**—38.5% of users have 30 to 60 days' and 28.6 can get deliveries in 30 to 60 days

JUST so long as Americans in general feel free to stand up in town meeting and let their neighors know in no uncertain terms just what they have on their minds, and just so long as American businessmen feel free to do the same in writing on the backs of questionnaires, things won't be going on behind any "iron curtain" in this country.

Free expression on the part of those contributing to STEEL's current study has been particularly gratifying. While some of these forthright comments are not entirely in line with the overall statistical findings in the accompanying table and charts, they do reflect significant facts as to the economic state of the nation as interpreted by independent observers in various parts of the country. Therefore this review embodies some of the more interesting of these observations on "components."

In viewing the figures on materials and components as a whole, it will be seen that inventories of the latter are slightly heavier. As an example, nearly a fourth of the belting and belt drive users have supplies on hand for three to six months, whereas the highest figure for this period in the steel classification is 4.8 per cent for stainless sheets and strip.

Users of components report fairly prompt deliveries now are promised on most items, the outstanding exception being electric motors. Deliveries have improved on some materials but remain extended on galvanized sheets and other flat rolled products. Duplication of orders for the same requirement is more prevalent for components than for materials.

Here are a few of the general comments which are not pinned down to any particular item. "We are using this period of uncertainty to explore the market." "Present policy is to hold down purchases to bare current needs." "We try to look ahead six months."

On the subject of stampings, one user points out that duplicate ordering of stampings is limited by the fact that it would involve duplication of expensive sets of dies.

Another user says: "Producers of stampings of large size have difficulty in meeting their customers' demands not only because of shortage of metals but also because of the scarcity of big presses. Large dies, on the other hand, are fairly easy to obtain.

"In the case of small stampings, for which metal likewise is lacking, small presses are relatively plentiful. Small dies, however, are much more difficult to obtain than are the large ones already mentioned."

The foregoing statement bears out the statistics on "Stamping and Forming Presses" and "Press Brakes and Shears" which appear in the next section of this report. It likewise seems to tie in with what is said elsewhere about other kinds of dies.

Speaking of forgings, we find this remark: "Copper forgings—situation very bad." This may be due in part to the die situation and it also may be one of the contributing factors to the shortages in motors and other electrical equipment.

In view of the copper situation, it is a bit surprising to have one contributor write: "Bronze castings—good inventory—5 days delivery." Users of iron and steel castings, however, are less cheerful. "Can't get castings to meet needs, delivery 5 months," says one user. "My casting inventory at rock bottom, 4 to 8 weeks partial delivery, 6 to 7 months complete delivery," says another. "Iron castings, 10 to 30 days' supply, best delivery 30 days," reads a third message.

Here is an interesting sidelight on the sand casting situation as diagnosed by one user. Speaking of nonferrous castings, he says: "One serious bottleneck seems to be in the pattern shop. Good patternmakers are scarce

POLICIES FOLLOWED BY CONSUMERS ON PURCHASES OF COMPONENTS

Percentage Reporting "Yes"

Percentage Reporting "No"

	DUPLICATE ORDERS *Question:* Have you placed duplicate orders for the same requirements with two or more suppliers?		SOURCES *Question:* Are you buying all you can obtain from any source?		LIMITATIONS ON PURCHASES *Question:* Are you limiting purchases to 30-60 days' requirements?	
Stampings	14.9%	85.1%	40.9%	59.1%	56.1%	43.9%
Forgings	8.1%	91.9%	26.5%	73.5%	67.6%	32.4%
Castings (Steel, Malleable, G. I.)	12.3%	87.7%	39.0%	61.0%	58.8%	41.2%
Castings (Nonferrous)	16.2%	83.8%	25.8%	74.2%	70.6%	29.4%
Castings (Die)	6.3%	93.7%	30.0%	70.0%	71.4%	28.6%
Weldments	11.1%	88.9%	25.0%	75.0%	87.5%	12.5%
Springs and Wire Shapes	5.9%	94.1%	24.4%	75.6%	65.9%	34.1%
Bolts, Nuts and Rivets	27.7%	72.3%	29.3%	70.7%	60.6%	39.4%
Bearings	15.7%	84.3%	28.3%	71.7%	59.1%	40.9%
Belting and Belt Drives	18.2%	81.8%	13.3%	86.7%	69.0%	31.0%
Couplings	16.7%	83.3%	23.5%	76.5%	68.8%	31.2%
Gears and Gear Drives	24.0%	76.0%	17.4%	82.6%	78.3%	21.7%
Hydraulic Transmissions and Controls		(None said "Yes")	12.5%	87.5%	77.8%	22.2%
Cylinders (Air and Hydraulic)	20.0%	80.0%	12.5%	87.5%	87.5%	12.5%
Electric Motors (Fractional)	42.9%	57.1%	62.5%	37.5%	40.0%	60.0%
Electric Motors (1-5 HP)	35.1%	64.9%	33.3%	66.7%	54.8%	45.2%
Electric Motors (Over 5 HP)	32.0%	68.0%	37.5%	62.5%	60.9%	39.1%
Electrical Equipment (Solenoids, Relays, Switches, Resistors, Control Instruments, etc.)	16.2%	83.8%	29.0%	71.0%	63.6%	36.4%

Current Consumer Inventories of Components and Deliveries Promised by Suppliers

Question: What is your current inventory position on each of the components listed?

Question: What are the earliest delivery dates now promised by your regular suppliers?

COMPONENTS	Percentage of Plants having supplies for: Less than 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.	6-12 mos.	Over 12 mos.	Percentage of Plants promised delivery in: Less than 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.	6-12 mos.	Over 12 mos.
Stampings	29.3	31.7	26.8	4.9	7.3	...	...	2.4	24.4	29.3	7.3	19.5	9.8	7.3
Forgings	8.3	13.9	30.6	22.2	19.4	5 6	0	...	13.3	16.8	16.3	33.3	20.0	3.3
Castings (Steel, G.I., Mall.)	11.3	37.1	32.3	12.9	3.2	1.6	1.6	3.5	14.3	35.7	16.1	14.3	14.3	1.8
Castings (nonferrous)	10.5	26.3	39.5	21.1	2.6	...	...	3.0	36.4	21.2	18.2	12.1	6.1	3.0
Castings (Die)	7.7	15.3	38.5	30.8	7.7	...	...	...	21.4	28.6	7.1	42.9	...	...
Weldments		57.1	14.3	14.3	14.3	...	...	...	33.3	22.3	33.3	11.1	...	...
Springs and Wire Shapes	10.9	23.9	30.4	23.9	10.9	...	...	2.3	7.0	34.9	23.3	27.9	4.6	...
Bolts, Nuts, and Rivets	7.2	28.9	32.5	18.2	12.0	1.2	...	4.3	14.3	22.9	14.3	25.6	14.3	4.3
Bearings	9.8	17.6	23.5	29.4	15.7	2.0	2.0	4.7	4.7	13.9	18.6	20.9	34.9	2.3
Belting and Belt Drives	9.1	21.2	30.3	15.2	24.2	...	...	11.5	11.5	30.9	7.7	19.2	19.2	...
Couplings		37.4	18.8	25.0	18.8	...	...	...	25.0	18.8	37.5	6.2	12.5	...
Gears and Gear Drives	18.2	22.7	27.3	18.2	9.1	4.5	...	...	8.7	13.0	30.4	26.1	17.4	4.4
Hydraulic Transmissions & Controls	28.6	...	28.5	14.3	14.3	...	14.3	...	12.5	...	12.5	37.5	12.5	25.0
Cylinders (air and hydraulic)	16.7	16.7	33.3	33.3	...	...	...	...	14.3	14.3	42.9	28.5	...	...
Elect. Motors (fractional)	38.2	17.6	20.6	11.8	8.8	...	3.0	...	3.1	...	...	9.1	33.3	54.5
Elect. Motors (1-5 hp)	36.4	15.2	21.2	9.0	12.1	...	6.1	...	...	3.1	9.4	6.2	56.3	25.0
Elect. Motors (over 5 hp)	33.3	9.5	14.3	14.3	19.0	4.8	4.8	...	...	...	9.5	9.5	57.2	23.8
Electrical Equipment (solenoids, relays, switches, resistors, control instruments, etc.)	26.3	15.8	31.6	15.8	7.9	2.6	...	...	5.7	8.6	22.8	40.0	17.1	5.8

at a time when these shops have a tremendous backlog of orders. The simplest kind of patterns now require at least 3 weeks, more intricate ones more than 6 weeks."

Several people report that in their districts aluminum, magnesium and bronze are all quite plentiful now, and that castings of these metals in medium sizes and in medium lots are relatively easy to obtain. They quote deliveries on those of aluminum and bronze at 30 to 45 days, and on magnesium from 14 to 30 days.

The die shortage, already mentioned in connection with stampings, likewise colors the die casting comments. For example: "If a die casting purchaser has the dies at hand, he can expect delivery of his castings within 60 days. If he has to get new dies made, however, they probably will require from 12 to 16 weeks—following which he will have to wait 8 more weeks for his castings.

"Die sinkers capable of making accurate die casting dies are relatively few in number, all of them are extremely busy right now, and the chances are that by the end of this year they will be booked ahead even more heavily than they are at the present time."

The following comment touches on the materials involved: "Aluminum now is plentiful. Therefore aluminum die castings are easy to obtain, provided that the dies already are existing. Zinc—on the other hand—continues to be one of the scarce commodities. Therefore zinc base die castings are much harder to get than are those made of aluminum."

A manufacturer of weldments states that he can make deliveries in 6 weeks—if the customer furnishes the steel. Otherwise his deliveries will be 3 to 5 weeks after steel is received from the mill—and the big problem is to get it from the mill.

"Springs and Wire Shapes" undoubtedly represent one of the highly diversified lists, ranging all the way from hair springs to car springs. Some of the eastern suppliers think that the 30 to 60 day and 60 to 90 day inventory figures reported to STEEL, shown in the accompanying table, run too high and that there has been more duplicate ordering than we show. Apparently there are regional differences here.

Reports on belting indicate that delivery difficulties increase in proportion to the size of the belts, ranging from 3 to 6 months on rubber belts for power transmission and much more than that on heavy duty conveyor belts.

Comments on couplings show considerable variance. One maker says that he shipped standards out of stock throughout the war, and still does so. Another quotes 2 to 3 weeks. Specials and large lots call for more time. This business is closely related to the gear business, wherein the comment is made that duplicate ordering of gears has been discouraged by stiff cancellation charges.

"I am down to less than 10 days' supply on hydraulic transmissions," says one user, "and my suppliers are quoting deliveries in 12 months." In the somewhat related field of hydraulic and pneumatic cylinders, one of the suppliers believes that the main reason why 87.5 per cent of users limit purchases to 30-60 days' supplies, is because of governmental limitations on such inventories.

The foregoing comment is interesting in view of the fact that another producer of air and hydraulic cylinders questions the size of the inventories which we show, on the ground that his customers never have made a practice of stocking these items. Also, he is of the opinion that the 20 per cent figure on duplicate ordering of cylinders is too high.

Our own thought on this is that the trend is toward standardized cylinders which can be stocked, and that government enforced short inventories led to duplicate ordering as a protective measure.

About the most cheerful thing that can be read into the numerous remarks about electric motors and control equipment is that there is going to be lively activity in this business for a long time to come merely in catching up with accumulated demand. This state of affairs is a forceful commentary on the high degree of electrification which is destined to prevail in America when production of civilian goods really does hit its stride.

Metalworking Equipment

- **Lathes**—23.46% now have lathes on order; 11.73% will buy within 60 days
- **Stamping and forming presses**—27.78% now have presses on order; 15.43% will buy within 60 days
- **Duplicate orders**—Only 2.2% of lathe users have placed duplicate orders; 4.2% have duplicate orders for milling machines; no other duplicate equipment orders reported
- **Extended Deliveries**—3.7% have canceled orders for lathes because of extended deliveries; 2.47% have canceled orders for boring and drilling machines; generally, such cancellations are reported to be light
- **Industrial Floor Trucks**—19.75% now have trucks on order; 8.64% will buy within 60 days
- **Electric Welding Equipment**—14.81% have welders on order; 11.73% will buy within 60 days

LITTLE more than a year ago, on June 25, 1945, to be exact, STEEL published a Special Report to Industry on Machine Tools. That report sought to forecast the shape of things to come in that machine tool users told what they expected of the machine tool builders in the way of improvements, and what they planned to purchase if and when what they wanted was made available.

While the current report is not limited to "machines which remove metal in the form of chips"—covering as it does stamping, forming and forging machinery and other plant equipment, in addition to some of the basic machine tools—it does show that after the year of activity which was foreshadowed by the previous report, there continues to be a lot of life in the new machine tool market. Comments indicate that many who had counted on getting their machines out of government surplus, either have been unable to find there what they want or have found the "hunting" in that field too tedious and discouraging.

Others have seen some of the new model machine tools and are convinced that their advantages will be of vital importance in days of growing competition and high labor costs. While machine tools no longer will sell themselves, it looks as though there are good prospects for companies which are developing new selling points and whose men are willing to get out and do constructive sales engineering jobs.

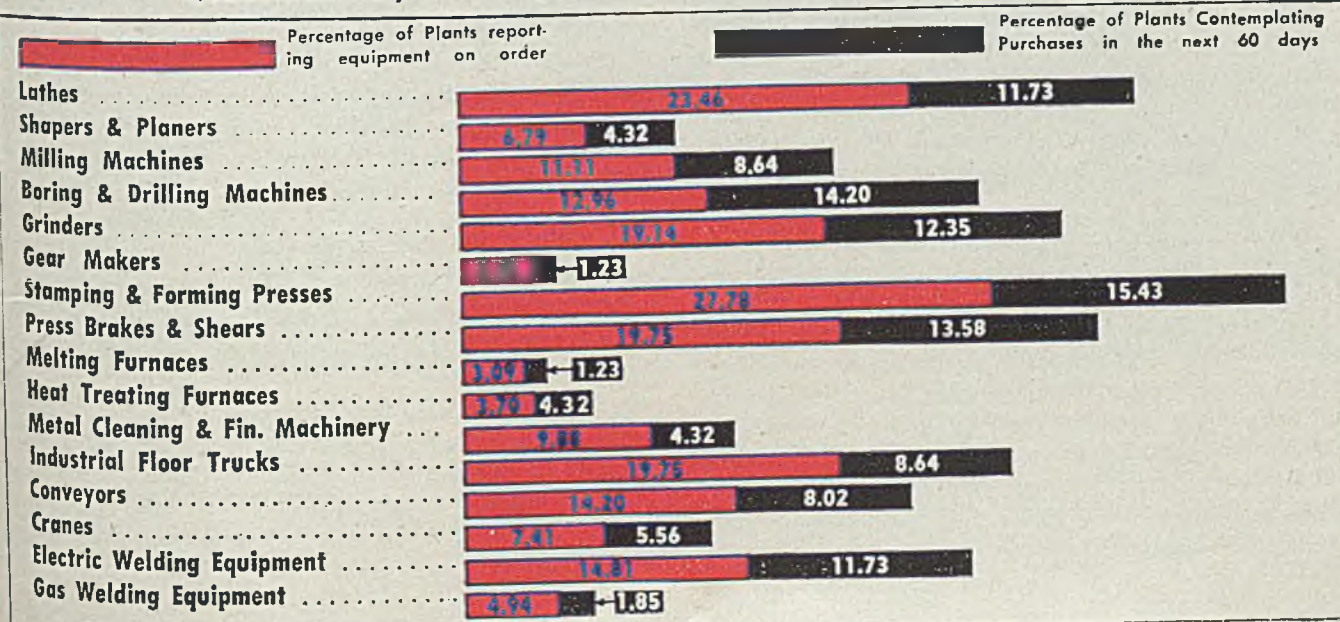
Some of the comments on the workings of government surplus disposal are not too complimentary. One machine tool user says: "Am buying milling machines, grinders, stamping and forming presses and melting furnaces from government surplus because I can't wait for deliveries from manufacturers of this equipment." Another reports: "We are resorting to purchases from government surplus only because of bad delivery conditions on new equipment."

Still another commentator makes some interesting suggestions: "Decentralization may be okay in some phases of surplus disposal, but in the case of machine tools there

EQUIPMENT NOW ON ORDER AND CONTEMPLATED PURCHASES

QUESTION: Do you now have on order any of the equipment listed?

QUESTION: Do you contemplate buying new equipment in next 60 days?



should be free exchange of information between all 34 regions involved. If a machine which is badly needed somewhere in central Ohio happens to be available in Eastport, Me., or San Diego, Calif., it can be transported at a freight charge which represents only an insignificant part of the overall investment in this badly needed piece of equipment. Buyers should have the benefit of country-wide rather than regional lists.

"Incidentally, if WAA jobs were known to be good only for four months—instead of the five years that those jobholders seem to be counting on—buyers would be getting a lot quicker action than they are getting, in the location and delivery of items of every variety which are in government surplus stocks."

Apparently standard engine lathes, especially those of the smaller sizes, are among the machines most eagerly sought after in government surplus and elsewhere. These machines are used in the smallest shops as well as in the large establishments. A typical comment on this situation is: "Standard lathes, 9 to 12 months delivery. Haven't canceled, however, because we believe it will be even more difficult to get this equipment a year from now."

DELIVERY PROMISES ON NEW EQUIPMENT

Question: How soon can you get delivery on orders placed now for equipment in which you are interested?

	Percentage of plants promised delivery within:					
	30 days	1-3 mos.	3-6 mos.	6-9 mos.	9-12 mos.	1-2 yrs.
Lathes	10.5	21.1	36.7	21.1	5.3	5.3
Shapers & Planers	...	28.6	57.2	7.1	7.1	...
Milling Machines	18.2	31.8	27.3	13.6	9.1	...
Boring & Drilling Machines	14.3	25.0	32.1	17.9	7.1	3.6
Grinders	19.0	45.2	28.6	4.8	...	2.4
Gear Makers	20.0	20.0	20.0	40.0	...	...
Stamping & Forming Presses	6.0	12.0	24.0	14.0	16.0	28.0
Press Brakes & Shears	...	10.3	25.6	10.3	15.4	38.4
Melting Furnaces	...	...	50.0	...	50.0	...
Heat Treating Furnaces	...	28.6	42.8	28.6	...	...
Metal Cleaning & Fin. Machinery	...	23.5	35.3	35.3	5.9	...
Industrial Floor Trucks	16.1	32.3	41.9	9.7	...	...
Conveyors	7.4	48.2	22.2	14.8	3.7	3.7
Cranes	10.0	10.0	30.0	10.0	40.0	...
Electric Welding Equipment	12.5	50.0	25.0	4.2	4.2	4.1
Gas Welding Equipment	42.9	57.1	...	...	...	...

Not recorded in the chart or table were two questions asked users of equipment: "Have you placed duplicate orders with two or more manufacturers with the expectation of canceling all but one order" and "Have you canceled any orders because of extended deliveries and because you think it will be easier to buy this equipment in the next 1-3 years?"

To the first question, the answers were a decided "no" with respect to all items except lathes and milling machines and the "yes" answers were respectively 2.2 and 4.2 per cent. Bulk of the answers to the second question also were "no". "Yes" answers for lathes were the highest at 3.70 per cent, other returns in order being 2.47 for boring and drilling machines, 1.85 for grinders and milling machines and 1.23 for shapers and planers and stamping and forming presses. Other cancellations were negligible.

The most numerous comments are ones involving the situation in stamping, forming and shearing machinery. "We would purchase stamping and forming presses, press brakes and shears, if delivery could be made immediately or even within 30 days." "Want stamping and forming presses but can't take a chance on such long deliveries." "Need press brakes and shears now—delivery is one year."

Several machine tool buyers report in effect that "the situation in special machinery is mighty tough." Some of them attribute it to scarcity of motors and other electrical equipment, which they say "is worse than during the war." "We need an automatic coil winding machine," says one, "but deliveries are 6 to 9 months and we need it now." "Want several spring coiling machines," writes another, "but we must put up with 9 to 12 months delivery."

In respect to finishing equipment, one user says: "Have placed buffing wheel orders all over the country, but it is this same story everywhere: OPA granted the textile mills an increase of about 30 per cent, while the buff manufacturers got about 10 per cent. Therefore it costs more to buy the cloth than the buff makers can charge for buffs."

Things look particularly bright in the field of mechanical handling. One manufacturer says: "Prospects are that the level of industrial truck production will continue at 100 per cent above the prewar level. War production gave a tremendous boost to mechanical handling of all sorts of materials. The truck industry fully expects to hold its gains in peacetime operations."

"Buyers are not in the habit of duplicating orders on power trucks. If unable to get delivery in a reasonable time from one source, they cancel that order and place a new order elsewhere. Hence your 'Zero' under 'Duplicate Orders'." In several instances it is reported that standard industrial trucks can be delivered within 30 days.

One spokesman for the furnace industry speaks his mind thus: "Some of those interested in the sale of industrial furnaces will do well to see in the rather low level of orders and prospective orders revealed by this survey, a real challenge to their selling ability. Those figures indicate that too many users plan to go on using their old furnaces—simply because the advantages of new furnaces and new heating techniques have not yet been pounded home to them as forcefully and as convincingly as they should be."

Some further and more general advice to salesmen, in the form of words of caution, comes from one of our contributors who has had long experience on the receiving end as far as sales methods are concerned.

This man says: "Right now some salesmen are overworking the 'sellers' market psychology. Where some commodity actually is reasonably scarce—say with deliveries running to 12 months—these salesmen stretch the point and claim that business is booked up 2 years into the future. To insure his future supply, the buyer thereupon overorders in terms of the true state-of-affairs.

"That buyer and others influenced by the same undue sales pressure actually do bring about an artificial and dangerous pushing ahead of delivery dates. We contend that no one can see ahead two years in business. Therefore it is our conviction that such long range bookings are unwarranted."

Quartermaster Corps Standardizes Spare Parts for Handling Equipment

Program results in 68 per cent reduction in volume of stock numbers, in 33 per cent saving in warehousing space for stocks and 40 per cent saving in time required for selecting and packing parts

SUBSTANTIAL reductions in the volume of spare parts carried and marked gains in efficiency and economy have resulted from a standardization program in spare parts for materials handling equipment used by the Army.

The Office of Quartermaster General undertook an 8-month survey to standardize such parts. Equipment covered in the survey included fork lift trucks, warehouse trailers and tractors and cranes suitable for use in warehouses and equipment used in loading and unloading ships, freight cars and other mediums of transport.

The program has resulted in a 68 per cent reduction in the volume of stock numbers for spare parts. By this reduction, a 33 per cent saving in warehousing space for stocks of spare parts and a 40 per cent saving in time required for their selection and packing have been accomplished.

Most of the manufacturers of materials handling equipment, before the war, were comparatively small companies. The Army dealt with 30 different manufacturers and acquired 160 different models, all of which required a complete inventory of spare parts for maintenance purposes.

Few of the manufacturers made their own engines, transmissions, axles, steering gears and similar components but purchased them from other suppliers. As a result many of the parts of one piece of equipment are identical with those of other manufacturers. However, the parts have been catalogued with different stock numbers. This resulted in large duplication in the Quartermaster Corps inventory of parts.

The new cataloguing and standardization of spare parts has facilitated supply control, procurement, and the storage and distribution of parts for materials handling equipment. It has also resulted in fewer vehicles being out of service for lack of parts at vital times, and reduced the inventories of spare parts in the various Quartermaster Corps shops and depots by providing a more efficient parts service.

Because of the success of the project on materials handling equipment parts, the Office of the Quartermaster General has begun a similar standardization project for assemblies and component parts of Quartermaster Corps special purpose vehicles.

Maximum effectiveness will be realized when the interchangeability of parts between materials handling equipment and other vehicles used by the Quartermaster Corps is known and put into use.

FOR SIDEWALK SUPERINTENDENTS: Comfort for spectators was uppermost in the minds of the engineers who designed this "Critics' Corner" for building enthusiasts. The enclosed grandstand overlooks the foundation for the new John Hancock Life Insurance Co. building in Boston and is equipped with two doors, one, the "Amateurs' Entrance," the other the "Experts' Exit." Visitors are presented with cards informing them that they are now Construction Connoisseurs. Inset picture above shows the view from the grandstand

Windows of Washington

Statutes of limitations, to protect industry against damage suits resulting from changes in federal regulations, to be pushed if Congress is called into extra session. State legislatures pondering limits on retroactivity of claims

IF THE 79th Congress is called into extra session, pressure may be exerted on members to pass two bills of considerable importance to industry. Until Congress eventually approves the provisions of these bills industry will continue liable for many unjust awards under damage suits.

Enactment of one of them, the Andrews bill, S. J. Res. 162, for example, would protect the Ford Motor Co. against damages from its compliance with the super-seniority ruling of Selective Service. Under this ruling Ford laid off or demoted thousands of workers to make way for veterans. Since the Supreme Court invalidated this ruling, a Ford-CIO umpire has decided that Ford is liable for back pay lost by the men displaced by the veterans. In this case Ford may have to pay out several hundred thousand dollars for obeying in good faith a ruling of a government agency later declared to be wrong.

Enactment of the Gwynne bill, H. R. 2788, would set a 2 or 3-year time limit for institution of damage suits under federal statutes, and a similar limit on retroactivity of awards. It would have saved employers from surprise awards levied against them retroactively as a result of administrative rulings and court decisions. One company found itself in debt over a period of many years for time spent by its employees in using shower baths on the plant premises. Another suddenly suffered a retroactive award covering time of lumberjacks in going into and out of the woods. The coal industry was hard hit last year by the Supreme Court decision in the Jewell Ridge case which held the employer must pay the miners for travel time between portals and working face.

Some of the states have adopted such statutes of limitations recently. Iowa, for example, has set a two-year limit on retroactivity. Other legislatures are expected to pass similar statutes this winter. However, there always is some uncertainty as to how the Supreme Court will construe state laws, and industry will not be protected adequately against arbitrary or capricious damage awards until Congress has acted.

NHA Plans Metal Houses

Almost any day the National Housing Administration should announce arrangement of its first contract for prefabricated metal houses. This contract, of the new "guaranteed-market" type, assures the contractor of a firm market for 90 per cent of his output. The contractor in this case will be the Wm. H. Harman Corp., Philadelphia, and will call for 10,000 homes to be made largely of light-gage steel.

The price ceilings on the Harman homes will be $6000 and $9000, respectively, on the 2 and 3-bedroom editions. These prices include erection and the building site. They will knock down into extremely small packages. The 3-bedroom house will be sent out complete in a 6 x 6 x 8-foot shipping case. The houses will be produced at Fullerton, Pa., in a plant bought through Defense Homes Corp. Financing will come to $6,000,000—to embrace a $2,000,000 RFC loan, a $2,000,000 bank loan backed by the RFC, and a $2,000,000 stock flotation.

This is the first move in a new campaign by Housing Expediter Wilson W. Wyatt to get at least 200,000 prefabricated metal homes into the veterans housing program in 1947. He has enlisted the help of some of the administration's big guns—notably Robert E. Hannegan and John W. Snyder—to persuade the aircraft manufacturers to drop their previous objections to getting into production of prefabricated aluminum houses. At present stress is being placed on seeking to get such companies into the production, under license, of aluminum houses developed by the Lincoln Homes Corp., Marion, Va.

Contract Near Signature Stage

One contract which seems to be approaching the signature stage is with McDonnell Aircraft Co., St. Louis; this calls for 10,000 aluminum houses. Some optimism has developed over chances that Douglas Aircraft may undertake to produce 50,000 aluminum houses. Other companies again approached in this new drive include Goodyear, Beech and Consolidated Vultee.

Negotiations also are under way on a guaranteed-market contract under which Fuller House Co., Kansas City, Mo., would produce 10,000 of its circular aluminum houses.

One angle still to be worked out is that of qualifying aluminum houses to meet FHA mortgage requirements. NHA engineers are seeking to develop accelerated test methods to determine the life of aluminum houses, and they are confident they will soon lick the problem.

Mr. Wyatt asked the War Assets Administration to declare a holiday on disposal of aircraft plants in order to help the drive for aluminum house production in such plants. For a number of reasons WAA probably will not accede. The main one is that much criticism has been leveled at WAA in the past for not making more rapid progress in surplus property disposal. Top WAA officials are anxious to push the job at maximum speed and get most of it out of the way by the end of 1947.

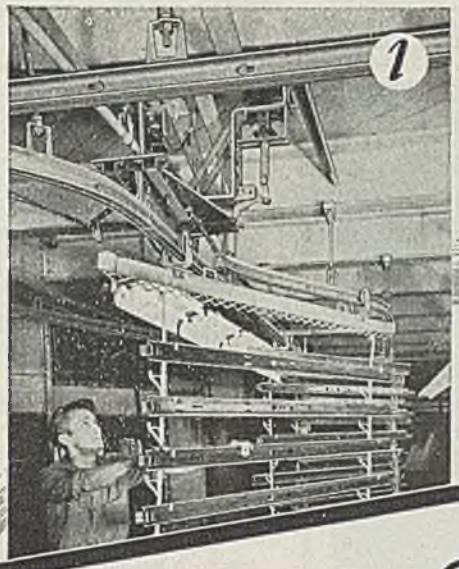
Flanders Named for Senate

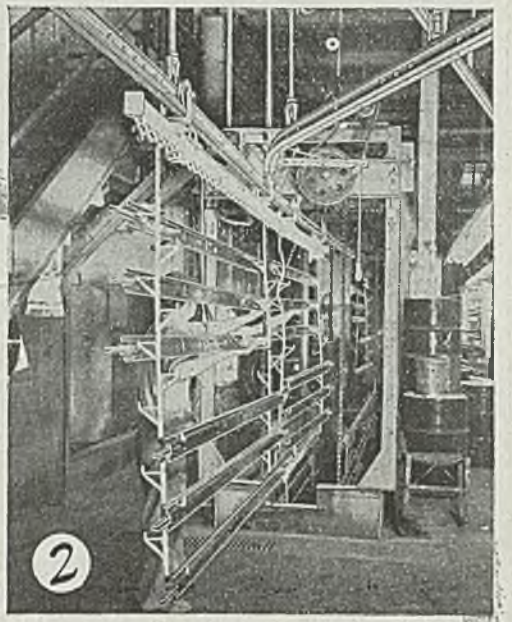
Nomination of Ralph E. Flanders on the Republican ticket as candidate for United States senator from Vermont has aroused a lot of interest in Washington because no man ever came to the Senate with higher all-around qualifications than Mr. Flanders. His experiences and achievements as a machinist apprentice, machinist, business paper editor, machine tool manufacturer and banker tell only part of the story. His chief forte is in the realm of business and fiscal economics. To this field he has devoted deep study over the past two decades. During this time he wrote two penetrating books, "Platform for America" and "Toward Full Employment."

In recent years his most influential work has been with the Committee for Economic Development. As chairman of the CED Research Committee, he has taken the lead in formulating the economic programs fostered by the CED. As is well known, these policies have been recognized as liberal in the truest sense of the word. CED's objective is the development of policies for the best good of all. CED is not among the pressure groups.

Inasmuch as Mr. Flanders is a machine tool manufacturer and a banker, it might be supposed that when he comes to the Senate—a Republican nomination in Vermont is equivalent to virtual election—he will be especially conscious of shortcomings in the national policies that hamper business. But those who have followed Mr. Flanders do not expect that. Rather, he will bend over backwards to avoid any bias. Labor's attitude on this score seems to be indicated by the fact that the CIO-Political Action Committee officially endorsed his candidacy.

Whether Mr. Flanders can retain this support after he gets into the Senate remains to be seen, for the unions are hard





AMERICAN MONORAIL *System* Uses Power for SPOT Handling

Extreme flexibility of movement is carefully maintained in this hand operated American MonoRail System. Where quick change of trolley travel or passage of carrier through process is required, power driven equipment takes care of such spots as . . .

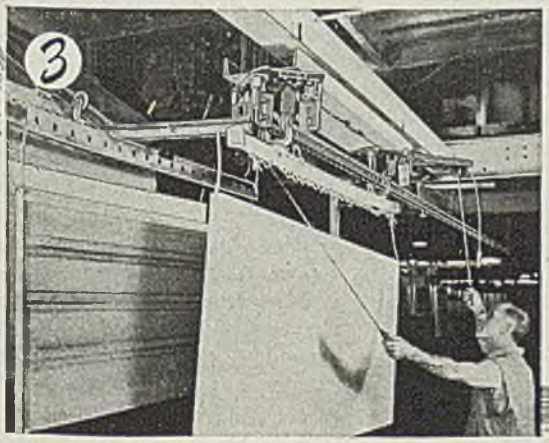
1. Trolleys on parallel tracks automatically brought into single track alignment by solenoid operated switch.

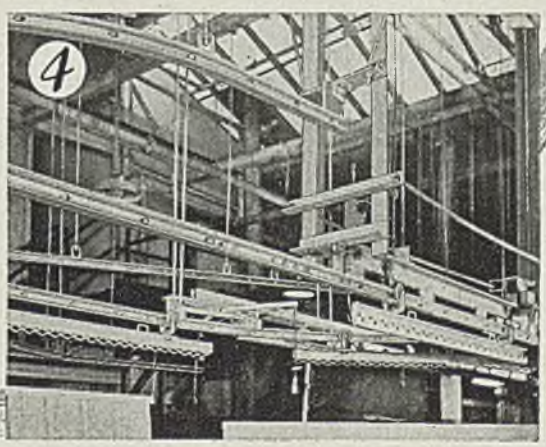
2. Carriers roll on track sections for *vertical* passage through degreasing tank. Cleaned parts move down the line to spray booths.

3. Crosstrack switches provide 90° transfer to shipping area as carriers roll off power conveyor in finishing oven.

4. Empty carriers raised to high level track for gravity return to loading station.

American MonoRail Engineers, with their wide experience in solving difficult handling problems, will gladly consult with you. Send for Bulletin C-1 illustrating hundreds of similar operations.





THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

NEW NLRB MEMBER: James J. Reynolds, left, was recently sworn in as a member of the National Labor Relations Board to succeed G. D. Reilly, who refused reappointment to a second five-year term. Present at the ceremony were, left to right: John M. Houston, a member of the board; John R. Steelman, reconversion director; Paul M. Herzog, chairman, NLRB; and Judge J. Warren Madden, Court of Claims, who administered the oath of office. NEA photo

taskmasters and demand undeviating and unquestioning loyalty at all times. They do not recognize any compromise; a member of Congress is either with them or against them.

Two senators from the ranks of manufacturing executives do not rate well with the CIO. In the latter's recent box score on the 79th Congress, Sen. Albert W. Hawkes of New Jersey, former president of Congoleum-Nairn Inc., drew 10 minus signs in his votes on 10 bills in which the CIO was interested. Sen. Homer E. Capehart of Indiana, identified with numerous manufacturing interests, was given two plus signs and seven minus signs.

The unions prefer such senators as Downey of California, Pepper of Florida, Murray of Montana, Kilgore of West Virginia, Mitchell and Magnuson of Washington, Chavez of New Mexico, Mead and Wagner of New York, Huffman of Ohio, Morse of Oregon, Guffey and Myers of Pennsylvania, Briggs of Missouri, Taylor of Idaho. The CIO box score gave them practically nothing but plus signs.

From Mr. Flanders' previous record, he is unlikely to be found in the latter group. He has a record for following his own lead.

Millions for Army Research

According to a War Department tabulation made at STEEL's request, the War Department now is committed to spend $281,500,000 on research and development work during the fiscal year ending June 30, 1947. The greater portion of this money will be expended with private firms and research institutions which are doing work under contract. The breakdown of expenditures for the various Army units is:

Quartermaster Service	$ 2,500,000
Transportation Service	1,000,000
Signal Service	25,000,000
Air Corps	185,500,000
Medical and Hospital Department	3,500,000
Engineer Service	6,000,000
Ordnance Service and Supplies	52,000,000
Chemical Warfare Service	6,000,000

Cut Public Works Programs

As a result of a White House directive of Aug. 2 various administration agencies are busy cutting down their public works programs for the fiscal year ending June 30, 1947. The principal agencies involved are the Army Engineers and the Bureau of Reclamation. The former has been ordered to cut its expenditures this fiscal year from $309 million to $185 million, and the latter from $170 million to $85 million. Army Engineers and Reclamation now are going over the work schedules they announced in July to decide where they will trim to bring their expenditures down to the White House figures. The revised lists of public projects they will launch this fiscal year will be completed by these agencies sometime in September. The Army Engineers work includes rivers and harbors work, while that of the Bureau of Reclamation includes hydroelectric development, irrigation and related projects.

Try To Keep Incentive Study

Some progress has been made in finding ways and means of continuing the work of the Commerce Department's Incentives Division, which was one of the victims of the reduced appropriation of the department for the current fiscal year. The sales incentive study is to be carried on under the direction of Burton Bigelow and Ray Bill of the National Distribution Council; it will be a Commerce Department sponsored project financed by the association. Efforts continue to be made to find ways and means of continuing the studies of incentive systems used to encourage labor and management but so far nobody has come along with a willingness to do the work and pay the cost.

Occupational Deferments Low

A minimum number of key workers in essential reconversion and transportation activities will be certified for occupational deferment under Selective Service by the Civilian Production Administration. Certifications will be honored only if the total number is kept small.

A registrant between the ages of 19 and 29 may be placed or retained in Class II-A if he is considered irreplaceable and indispensable to an activity essential to the national existence or if he is certified by an appropriate government agency.

CPA has authority to certify two classes of registrants for occupational deferment: (1) Qualified and irreplaceable production workers in industries CPA has designated as critical; (2) supervisory, technical, or scientific personnel in essential industries.

Critical products and materials which will be used as a basis for certification include the following: Steel, pig iron, wire nails, gray iron and malleable iron castings, bale ties, antimony, lead, tin, copper and copper products, selected builders hardware, bituminous and lignite coal, underground coal mining machinery, concrete masonry products machinery, building board specialized machinery, clay building products specialized machinery, selected electrical wiring devices, farm machinery, magnetic wire, power-driven mechanical presses, fractional horsepower motors, plumbing fixtures, cast iron and convector radiation, railroad car brake shoes, registers and grilles for heating systems, cast iron soil pipe, textile machinery, and warm air heating equipment.

British Steel Fabricator To Enlarge Shops

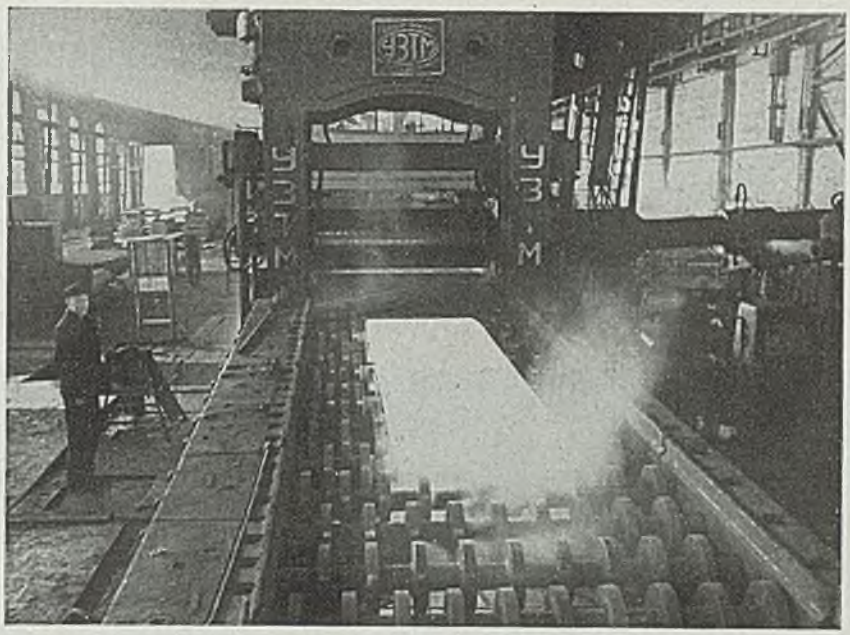
Dorman Long & Co. Ltd. announces expansion program which will increase output by 20 per cent

LONDON

EXPANSION of the main structural engineering shops of Dorman Long & Co. Ltd. in Middlesbrough is being undertaken to facilitate handling and fabrication of the large amount of structural steelwork which the company has on order for domestic use and export.

Area of the existing shops, already much the largest in Great Britain, is being increased by over 110,000 sq ft at a cost of approximately £120,000. The extensions will be equipped with new and up-to-date handling devices to insure the even flow of material and enable the output of fabricated steel from these shops to be increased by about 20 per cent.

At the present time, considerable tonnages of constructional steelwork for 12 power stations, some of which are of exceptional size and capacity, are being handled. With the additional facilities now being provided, larger and heavier constructional steel units than have yet been fabricated in Great Britain can be undertaken. In addition to the heavy structural steelwork, very large tonnages of lighter structural work are also passing through the shops. At the same time an important contract for 10,000 all-welded railway wagon bodies for the home railways is in mass production.



STEEL FOR RUSSIA: Thousands of tons of steel are being rolled daily by the Magnitogorsk Iron and Steel Works and shipped to Russian industrial enterprises. The works' productive capacity was increased considerably during the war and is scheduled to be boosted further in the coming five years. Operating today at this giant plant are six blast furnaces, 23 open hearths (formerly 12), 13 rolling mills (formerly seven), and eight coking batteries (formerly four). Sovfoto

British Association Appoints Superintendent Metallurgist

LONDON

Dr. M. L. Becker has assumed his duties as superintendent metallurgist to the British Iron & Steel Research Association, London.

Until recently he was chief metallurgist to the Gear and Tool Divisions of David Brown & Sons Ltd., Huddersfield. Previously he was on the staff of the National Physical Laboratory. For a considerable period Dr. Becker has been closely associated with the iron and steel industry, having done research on gaseous equilibria, alloys of iron, spring steels, materials for high temperature service and many allied problems. Recently his interests have been primarily in the use of steels and alloys in engineering and in this connection he has been concerned with the development of works processes of gas carburizing and of flame and induction hardening.

Institute of Metals Plans Two-Day Autumn Meeting

LONDON

Autumn meeting of the Institute of Metals will be held in London, Sept. 10 and 11.

Three technical papers will be presented during the afternoon of Sept. 10 and nine will be presented on the morning of Sept. 11.

Dutch Imports from U.S. in 1946 May Total $340 Million

Imports by the government of the Netherlands from the United States in 1946 are expected to total $340 million, according to reports received by the Office of International Trade, Department of Commerce. Of this total, $250 million has been set aside for industrial commodities and the remainder for food and food-producing items.

These imports are to be financed by the recently granted Import-Export Bank loan of $200 million, by two previous loans totaling $100 million, and by the realization of Dutch assets in this country which were recently unfrozen.

Of the total amount to be imported, $93,350,000 will be spent for metals, metal finished products and electrical products which are divided as follows: Metals (iron and steel), $20,000,000; metals (nonferrous), $18,150,000; metals (finished products), $52,600,000; electrical products, $2,600,000.

Belgian Government Likely To Allow Wages to Increase

The new government in Belgium is expected to permit an increase in wages in view of the fact that the French government has allowed wages to rise.

Also anticipated in Belgium are certain changes in methods of price fixing and in control methods of the new government.

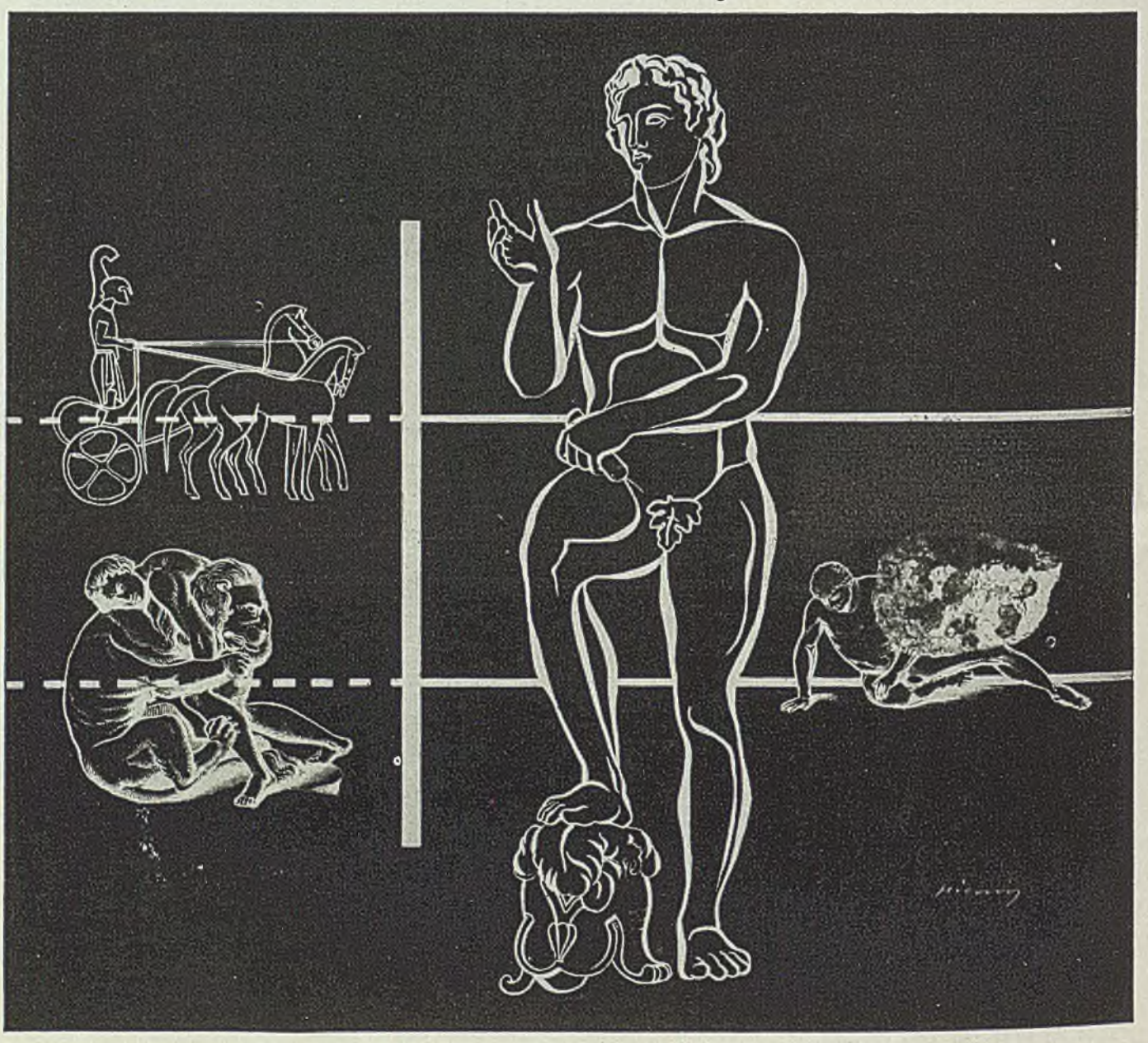
Austria Placed in Group K Countries for Licensing

Austria has been removed from Group E countries by the Office of International Trade, Department of Commerce, and now is included in Group K countries, so that general licensing privileges applicable to Group K destinations are now available.

IT TAKES MORE THAN MUSCLE

According to legend, Polydamas, the Greek athlete, killed a lion with his bare hands, stopped a chariot in full flight, and lifted a raging bull off the ground with ease. His career, however, came to a spectacular end when he tried to catch a huge falling rock.

Today, sudden, heavy loads end the life of many steel parts. Low temperatures, for instance, can have a depressing effect on the impact strength of steels. Molybdenum steels, which combine deep hardening and freedom from temper brittleness, reduce this risk.



MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"
CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

Climax Molybdenum Company

500 Fifth Avenue · New York City

MOLY

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

Mirrors of Motordom

Automotive companies and body manufacturers experiencing difficulty in obtaining experienced sheet metal layout men, designers and similar engineering personnel required to develop new body styles

DETROIT

FOR the past several weeks newspapers here have carried daily advertising of both classified and display types from motor companies and body manufacturers seeking experienced sheet metal layout men, designers, draftsmen and similar engineering personnel required in the development of new body styles. The inference is that programs on 1948 models are about to get under way. These models, it will be recalled, are slated to be the first of the real "postwar" creations, and will reflect numerous changes in styling to carry them well ahead of the 1947 models which many manufacturers will introduce at year-end or shortly thereafter.

The suggestion also is evident that manufacturers are having a difficult time in filling the ranks with the required complement of designers and layout men, the reason probably being that for the past six years or more there has been a minimum of this type of work to be done, with all the emphasis on war production and then the resumption of what are virtually 1942 models with minor embellishments. Further than this, it is reported that current advertising is not attracting men in sufficient numbers and there is considerable concern over whether they will be located. Experienced layout men just do not sit around for several years awaiting resumption of automotive programs and about the only way to re-enlist them is to offer, in addition to attractive working conditions, reimbursement of sufficient proportions to draw them away from present jobs.

Several Trends in Body Styling

What are the changes being developed in body styling? At this stage, several trends are apparent which probably will be followed by many passenger car builders. One is improved vision in the rear which the 1947 Studebakers have accomplished by running the rear window around the quarter so that no blind spots exist in the rear. This calls for major structural innovations in body assembly.

A second trend is the blending of front and rear fenders into the body side panels. Kaiser-Frazer and Studebaker have incorporated this treatment into their current models, and it sets a pattern which the rest of the industry either will emulate or improve upon. It permits still wider body interiors with more seating space. On the score of seating space, two builders—Willys-Overland and Darrin—have evolved designs which reduce rear seats to a width accommodating two, while the front seats still will handle three, the reason for the narrower rear seat being that it is moved ahead and lowered, with width restricted by the rear wheel tread.

The integral type of chassis and frame, pioneered by Lincoln and the Nash 600, probably will be extended to other models, doubtless including the lightweight low-price cars being developed by Ford, Chevrolet and Plymouth, although little has been heard of the latter's move in this direction. It is assumed for competitive reasons that Plymouth will have such a model.

In suspension systems, particularly front suspensions, some active engineering work has been going on for a number of years which may see fruition in the 1948 models of several makers. Much of the early work was done at the University of Michigan, the design being based around a new type of ball and socket joint in which the socket is of a nonmetallic material—identified by some as a type of stearate—into which the ball is fitted. The latter in preliminary work has been fabricated of steel, over which a sheet of Monel metal is spun. It is still too early to give much more than these few sparse details. Presumably the springing action in the system is still derived from coils, with the new joints a part of the wishbone or suspension frame. Main advantage claimed for the system is an appreciable reduction in unsprung weight.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Tabulated by Ward's Automotive Reports

	1946	1941
January	121,861	524,037
February	83,841	509,332
March	140,777	533,878
April	248,318	489,856
May	247,620	545,321
June	214,511°	646,278
July	330,764°	468,897
August	360,500°	164,793
Estimates for week ended:		
Aug. 17	88,990°	45,550
Aug. 24	91,360°	45,525
Aug. 31	73,305°	39,965
Sept. 7	65,000°	32,940

°Preliminary.

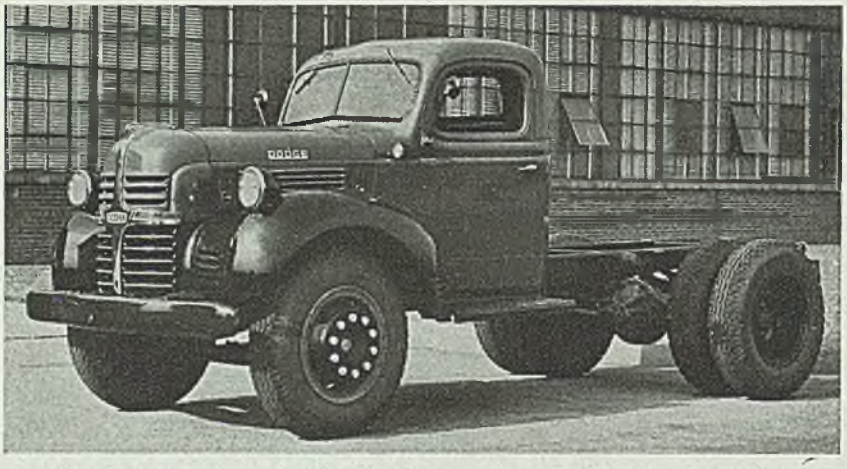
Buick Completes New Plant

Completion of the first of its major construction projects launched in a postwar expansion and modernization program is announced by Buick. The new building, having 252,000 sq ft of floor space and designed as a part of the company's final assembly area, provides modern facilities for manufacturing, subassembly, parts receiving and storage operations in connection with the final assembly of cars. It adjoins the Buick assembly line. Construction of a dozen other buildings, including a large sheet metal plant, expanded foundry and forge facilities, and shipping and storage structures, will provide another 1,000,000 sq ft of space, over and above the 1,000,000 sq ft added to facilities by purchase of the government-owned tank arsenal at Grand Blanc, Mich., as a parts warehouse and shipping department, and a government-owned aluminum foundry for conversion to a machine shop.

The new manufacturing and subassembly building, erected on the site of the original Buick final assembly plant built in 1907, is a two-story structure 187 ft wide and 996 ft long. One portion of the building is 51 ft high to accommodate two 15-ton bridge cranes used for unloading frames and other parts from railroad freight cars which are routed directly into the building. At the opposite end of the structure are unloading docks which can accommodate 16 large trailer trucks.

First floor of the building is used for receiving materials for assembly divisions and manufacture of light chassis parts. The second floor is utilized for painting of wheels and miscellaneous small parts, and for receiving and storing of axles which are carried to the building from the axle manufacturing plant on a 7000-foot conveyor. Axles are routed on conveyors either to the assembly line according to production specifications or to freight cars for shipping to assembly plants in other cities.

In addition, new cars will be moved



NEWEST DODGE TRUCKS: Latest additions to the Dodge truck line are two 3-ton heavy duty models, one shown above, in five wheelbases ranging from 136 to 196 inches. One has a gross vehicle weight rating of 20,000 pounds and the other 23,000 pounds. As tractors both have gross tractor-trailer ratings of 37,000 pounds

by conveyor from the final assembly area through the new building and over an enclosed bridge to the final touch-up operation in another building. After cars are completed they are carried by conveyor over a second connecting bridge to the shipping dock eliminating the necessity of moving cars on factory roads.

Ford Remodels Power House

Remodeling of the old power house at the Ford Motor Co.'s Ypsilanti, Mich., plant to provide a modern administration building for all of the company's village industries is nearing completion and the building will be ready for use the latter part of this month.

Approximately $70,000 has been spent on the project.

Chrysler Replies to Union

Announced intention of the Chrysler union local to reopen wage negotiations on Oct. 16 was given to the press two days before it was given to the management—a standard union technique. Robert W. Conder, in a reply to the union, took issue with the UAW position in trying to defend higher wages without higher prices and concluded by saying: "If we could obtain from suppliers the free flow of materials necessary to build the automobiles we have scheduled, and employees would attend to their work regularly, our employees would increase their earnings through more regular work and output of automobiles. As you know, too, earnings of employees, have been lower than they ought to have been because of strikes. Fifty unauthorized strikes occurred in our own plants between last June 6 and Aug. 21. All these strikes violated your union's contract with Chrysler and none need have taken place if the men involved had complied with the bargaining procedure under that contract. We do not believe there should be either another round of wage increases at this time or another round of strikes."

Incidentally, the international executive board of the UAW has slashed expenses by $65,000 per month in the effort to keep within expected income. Staff of international representatives has been reduced by 62, bringing the total number down to 331, compared with 440 a year ago. Most of the cut has been in the Detroit area. The UAW treasurer also announced at the same time the international had received $1,354,263 in strike fund contributions, and had distributed $1,338,670. These disbursements go to locals on strike and in need of funds.

Six Boeing Stratocruisers Ordered by British Firm

Boeing Airplane Co., Seattle, has announced signing of a contract with British Overseas Airways Corp. for construction of six luxury Boeing Stratocruisers. The 67½ ton double-deck airliners are scheduled for delivery during the second half of 1947 and will take their place with the buyer's other aircraft operating between North America and United Kingdom.

Plans call for maximum passenger comfort and adequate facilities for transoceanic service. The new airplanes will be powered by four Pratt & Whitney four-row 28 cylinder Wasp Major engines of 3500 hp each. Curtiss electric four-bladed reversible pitch propellers will be used. The tricycle landing gear will have double wheels. The Stratocruiser, which has a total usable volume of 4320 cu ft of space in the passenger compartments, is equipped with an extended development of the Boeing pressurization system, affording the equivalent of sea level at all altitudes up to 15,000 ft and 8000 feet altitude at an actual 30,000 ft.

These aircraft will have a wing span of 141 ft 3 in., length of 110 ft and overall height of 38 ft 3 in. Takeoff gross weight will be 135,000 lb and landing gross weight 121,700 lb. Cruising speed at 25,000 ft will be approximately 320 to 340 mph.

The order brings to 55 the total number of Stratocruisers Boeing will build for six major air carriers at a total sales price in excess of $75 million.

Shipments of Fractional Horsepower Motors Rise

About 1,700,000 fractional horsepower alternating current motors were shipped in August compared with estimated July shipments of 1,500,000, Civilian Production Administration reported recently. Total shipments for the year of July 1, 1945, through June, 1946, amounted to 12,758,780 units, a monthly average of 1,063,230. This contrasts favorably with the average monthly rate of 885,097 in 1939.

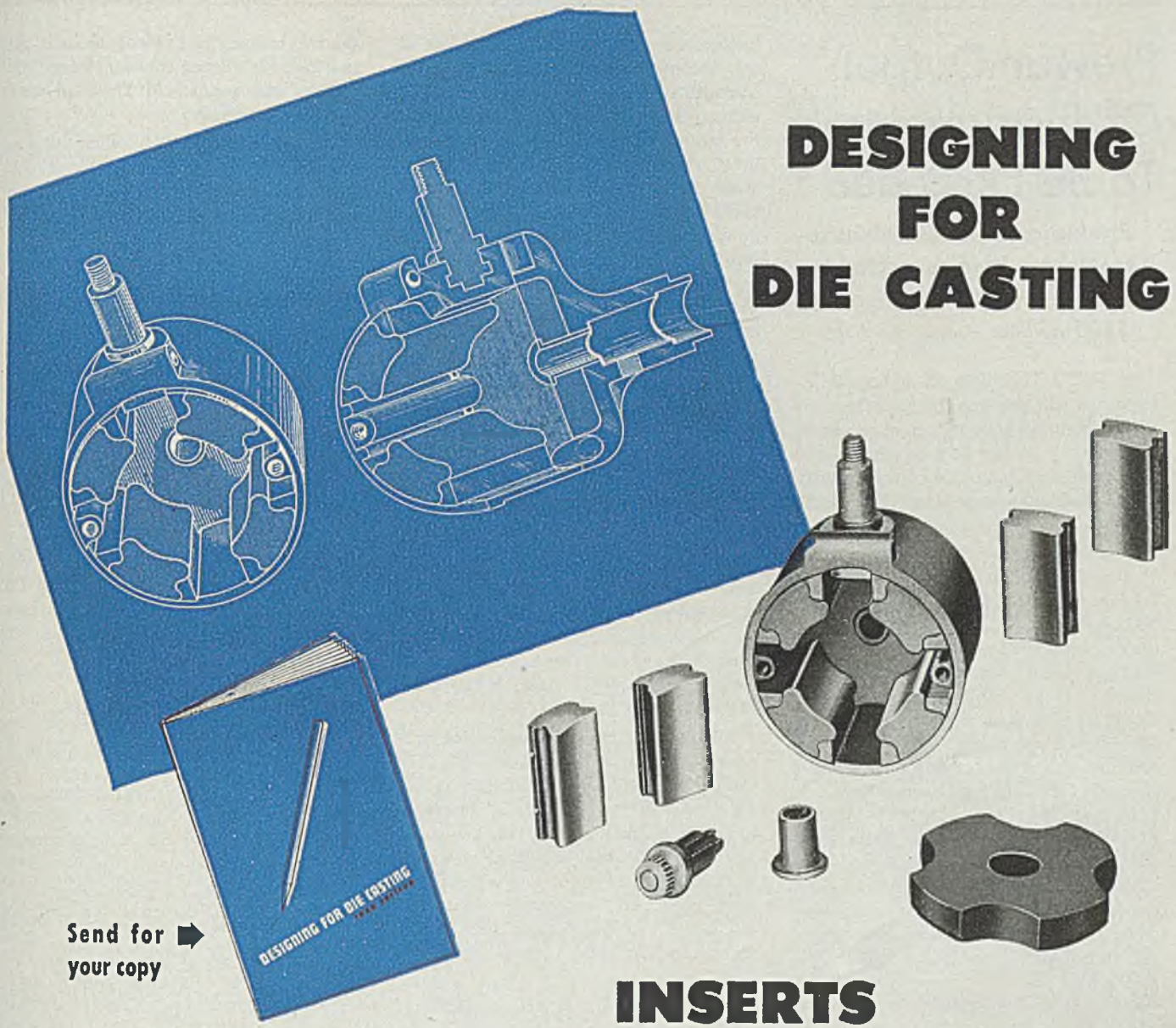
The estimated August increase was based upon expectation of regular, although still inadequate, flow of materials such as scarce copper magnet wire and electrical grades of sheet steel, and also the entrance of new plants into the field.

June and July shipments were affected by the closing of several plants, some for two weeks or more, because of lack of materials. Shipments in May, totaling 1,653,744 units, hit the peak for the 12-months period ending with June. The total for June was 1,610,256 units.

As no appreciable increase in the production of electrical sheet steel is expected before the second quarter of next year, production is not expected to go much above present levels before April, 1947.

Though shipments of fractional horsepower alternating current motors have more than doubled from the low of 681,991 units in July, 1945, the backlog of orders has continued to increase. In July, 1945, the backlog amounted to about 1 million units; in June, 1946, the order backlog called for almost 33 million.

DESIGNING FOR DIE CASTING



Send for ➡ your copy

INSERTS

In designing die castings, inserts should be employed whenever their use achieves results that cannot be realized at equal cost by other means. Cast inserts are generally used for one or more of the following reasons:

1. *To provide greater strength, hardness, wear resistance or ductility, or to obtain magnetic and other special properties not possessed by the casting itself.*
2. *To provide passages or shapes of parts which cannot be cored or cast, or which can be obtained more economically with inserts.*
3. *To effect an assembly not so readily or so inexpensively achieved by other means.*

Seven assorted inserts are accurately positioned and bound together in the zinc alloy die cast generator housing shown here. The inserts (grouped above) are: four soft steel pole pieces; an aluminum-nickel-cobalt magnetic disk; a bronze bushing; a steel support stud. In the casting operation a zinc alloy housing is formed around the seven inserts, bringing them into a one-piece unit.

Non-metallic inserts which frequently have been cast in die castings include cloth, fibre, compressed paper, porcelain, wood and plastics.

There are a number of points to be considered by the designer when inserts are to be employed in die castings. These and other design considerations are covered in our booklet "Designing for Die Casting." To insure that you will get the most from your die casting dollar, ask us—or your die casting source—for a free copy of this booklet.

The New Jersey Zinc Company, 160 Front Street, New York 7, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Prewar Output Of Instruments To Be Exceeded

Production of industrial instruments in 1946 expected to total between $75 million and $100 million

MANUFACTURERS of industrial instruments will produce this year between $75 million and $100 million of products, spokesmen predicted at a meeting of the War Problems Committee of the industry at the Waldorf-Astoria Hotel, New York.

This would compare with the peak volume of $150 million in the war years of 1943 and 1944, but would be well above the normal prewar annual output of about $60 million. J. O. Tragart, chairman of the committee and assistant sales manager, Foxboro Co., Foxboro, Mass., asserted that the various plants have a backlog of orders ranging from three to six months. He believed that business would probably continue at current rates for some time because of demand from companies which were unable to obtain priorities for equipment during the war and also from those which are expanding their facilities.

However, production is handicapped by shortages of such essentials as small components, relays, transformers, movements and numerous electronic items, Mr. Tragart added.

Germany's development of industrial instruments is 20 years behind that of this country, according to a report to the committee by four representatives of the industry who investigated plants there at the request of the United States government. The four representatives reporting were: A. D. Eplett, chief research engineer, Manning, Maxwell & Moore, Bridgeport, Conn.; E. D. Haigler, chief application engineer, Foxboro Co.; J. C. Peters, research engineer, Leeds & Northrup Co., Philadelphia; and D. C. Lamb, production engineer, Taylor Instrument Co., Rochester, N. Y.

These engineers visited 53 plants in Germany, covering various industries.

New GE Waterford Plant To Produce Silicone Material

Reduced costs and a consequent broadening of uses for silicone products will result gradually when production is started sometime after the first of next year at General Electric Co.'s new Waterford, N. Y., plant, according to Harry K. Collins, manager, GE Resin & Insulation Materials Division.

Although silicones are now being produced only on a pilot plant scale, Mr. Collins said, tremendous interest is being shown in the products by manufacturers in a great variety of industries. The primary feature of silicone materials, he said, is their ability to withstand a wide range of temperatures from 575 degrees F. to 60 degrees below zero without losing their original characteristics.

The products which will be made at the Waterford plant will include raw material for silicone rubber, silicone oils, greases and resins and Dri-Film water repellent material.

Immediate employment when the plant opens will be 100 persons, Mr. Collins said, but added that expected expansion would increase that number several times.

American Brake Shoe To Build Plant at Niles, O.

American Brake Shoe Co., St. Louis, has awarded a contract to James Stewart & Co., New York, for construction of a $200,000 plant at Niles, O. The plant, to be located on the long abandoned site of the old Thomas hand sheet mill, will make locomotive parts. Construction is scheduled to start Sept. 9, finishing in 180 to 200 days. The old Thomas mill once was owned by Thomas Steel Co. and subsequently was owned by Youngstown Sheet & Tube Co. and later by Empire Steel Co.

Navy Orders Steel Units For "Canning" Ships' Guns

Aetna Standard Engineering Co., Youngstown, has a $1 million order for making 3277 steel air tight protective structures for "canning" expensive guns aboard the Navy's "moth ball" fleet, President E. E. Swartswelter said last week.

The units are made of high grade sheet steel, are 12-sided, and resemble huge chocolate drops. They require in-

NEW WILLIMANTIC PLANT: American Screw Co., Providence, R. I., will move into its new plant in Willimantic, Conn., in November. The facility which contains almost 400,000 square feet of floor space includes one huge room with 318,000 square feet of manufacturing space. The room, pictured above, is air-conditioned, equipped with sound absorptive ceilings and floors, and fluorescent lighting. In it will be produced the American Phillips line of machine screws, sheet metal screws, wood screws, slotted screws and stove bolts

tricate welding jobs because of the combination of straight and curved sides. The company expects to make 1000 a month, and believes it may lead to more orders. They are being fabricated at the Ellwood City plant and each is shipped as a complete unit so it may be assembled aboard ship.

Stainless Steel Foundry Organized in Milwaukee

Stainless Foundry & Engineering Co., Milwaukee, has been formed by Harvey W. Kutchera and John McBroom to manufacture stainless steel castings for the food and chemical industries. Said to be the only foundry in this country devoting all its efforts to this type of castings, the firm is specializing in low carbon 18-8 stainless steel castings types 304 and 317S, and the stabilized types 321 and 347.

BRIEFS . . .

Wickwire Spencer Steel, New York, division of Colorado Fuel & Iron Corp., has moved its general sales manager's office from 500 Fifth Ave., New York, to 361 Delaware Ave., Buffalo 2. The company's wire rope department has been moved to the company's plant at Palmer, Mass.

—o—

Forter-Teichmann International, subsidiary of Loftus Engineering Corp., Pittsburgh, has been awarded a $1 million contract to design and build three plants in Damascus, Syria, for that country's glass and porcelain industry.

—o—

Handy & Harman, New York, has begun construction of a metal refining plant in Los Angeles which is scheduled for completion by the latter part of the year.

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Allis-Chalmers Mfg. Co., Milwaukee, has contracted with Bituminous Coal Research Inc., Pittsburgh, to build a new type gas turbine locomotive power unit to operate on powdered coal. The unit is designed to generate 3750 hp.

—o—

Kennametal Inc., Latrobe, Pa., has appointed H & H Tool & Supply Co., Wichita, Kans., as its representative in the Wichita area.

—o—

National Association of Manufacturers, New York, has moved its southeastern regional office from Biltmore Hotel, Atlanta, to 1303-6 Candler Bldg., that city.

—o—

Owensboro Ditcher & Grader Co., Owensboro, Ky., has expanded its plant and facilities by more than a third in the past six months and is planning further expansions.

—o—

Elematic Equipment Corp., pyrometer manufacturer, formerly located at 6046 S. Wentworth Ave., Chicago, has moved into larger quarters at 1150 W. Marquette Rd., Chicago 21.

—o—

Lindsay Corp., Chicago, has appointed the following as regional representatives: Reinhofer & Breaux, Chicago, for the central states; Lindsay-Pacific Co., San Francisco, for the West Coast; and Thomas T. Tucker, 1102 Candler Bldg., Atlanta, for the southeastern region.

—o—

Ward Leonard Electric Co., Mt. Vernon, N. Y., has established a district office at 38 Newbury St., Boston 16. The company has also appointed L. F. Church Co., San Francisco, and Marvin H. Kirkeby, 237 Sheridan Ave. S., Minneapolis, as sales representatives.

—o—

Rapids - Standard Co. Inc., Grand Rapids, Mich., has leased a plant in that city to house its enlarged experimental and development department.

—o—

Stacey-Dresser Engineering, Cleveland, a division of Stacey Bros. Gas Construction Co., one of the Dresser Industries, has been awarded a contract from Cincinnati Gas & Electric Co., Cincinnati, for engineering and supervision of erection of a large propane-air gas plant.

—o—

Sexton Foundry & Mfg. Corp., Baltimore, has acquired the plant of Westport Paving Brick Co., that city, and will use the facility to produce small gray iron castings.

—o—

Aircraft Salvage Corp., Baltimore, has been formed to dismantle surplus planes, melt down the aluminum and dispose of the remaining parts. Recovered aluminum will be shipped to the local plant of Tomke Aluminum Co. for refining.

—o—

Lees-Bradner Co., Cleveland, has appointed the following as representatives: Lind-Farquhar Co., Boston, for New England; Golden & McCoy Machinery Co., Cleveland, for northern Ohio; and Burleigh-Stocker Machinery Co., Detroit, for eastern Michigan.

—o—

Douglas Aircraft Co. Inc., Santa Monica, Calif., has designed a four-engine airplane specifically engineered for economical transportation of air cargo. The new plane, designated as the DC-4-1037, has cargo capacity of 22,700 pounds and range of 1500 miles.

Westinghouse Plant Plans To Boost Output

Production of air conditioning and industrial refrigeration equipment to be twice that of best prewar year

PRODUCTION of air conditioning and industrial refrigeration equipment during the next 12 months at the Hyde Park, Mass., plant of the B. F. Sturtevant Co. Division of Westinghouse Electric Corp., Pittsburgh, is expected to more than double the quantity built during the best prewar year.

In making this announcement, G. C. Derry, vice president and general manager of the division, also revealed plans for stepping up manufacture of mechanical draft fans for power stations and fans for industrial plants.

Expansion in these two fields, as well as in the rapidly growing transportation field and in many others concerned with air handling, should ultimately increase the division's production force by 50 per cent and the sales and engineering staff by 30 per cent, Mr. Derry said. The division's current backlog of orders totals approximately $14 million.

Nationwide surveys indicate that an average of more than $200 million in air conditioning equipment alone could be sold each year for the next five years, Mr. Derry said.

The division's plans for increased production of air handling equipment for public utilities have been geared to estimates pointing to a 30 per cent increase by 1950 in capacity for generating electricity.

Among other equipment scheduled to go into heavier production are products for heating and ventilating systems in office buildings and schools, many types of air handling apparatus for industrial plants, and electrostatic air cleaners.

Founder of GE Laboratory To Receive Research Medal

First medal to be awarded by the Industrial Research Institute Inc., New York, will be presented Oct. 17 to Dr. Willis Rodney Whitney, organizer in 1900 of the research laboratory of General Electric Co., Schenectady, N. Y. The presentation is to be made at the Westchester Country Club, Rye, N. Y.

Industry, Labor Seek Government Aid in Getting Steel for the West

Self-appointed committee puts pressure on political representatives who in turn are attempting to force directives from governmental agencies. Group warns that many western plants will have to close unless additional steel is forthcoming

SAN FRANCISCO

THE GROWING shortage of steel on the West Coast, plus the fear of widespread shutdowns unless the scarcity is relieved soon, has resulted in action by San Francisco industrial and labor leaders designed to clarify prospects.

This action is taking the form of pressure on political representatives in Washington, who, in turn, have been attempting to force directives from various governmental agencies in the national capital.

Although the steel shortage has been becoming increasingly worse for a number of months, the recent steps to force consideration of the coast's plight were said to be the first organized attempt in that direction. It came from a self-appointed management-labor committee, made up of steel fabricators, steel distributors and representatives of interested labor unions.

Of first consideration to the committee, and the interests it represents, is the serious effect a continuing shortage of steel will have on the housing program. It was pointed out, for instance, to California congressmen that unless supplies of steel sheets are increased, builders will be wholly unable to get such already scarce items as furnaces, furnace fittings, waterspouts, eaves, troughs, ventilators, nails, screening, angle irons and the like. The shortage of castings also is becoming a serious bottleneck.

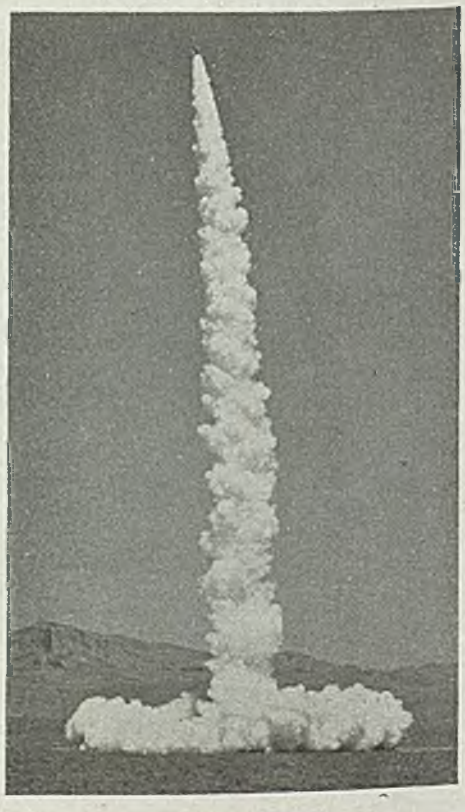
The committee also said that the only relief to the shortages must come from eastern mills. Although the West Coast's steel capacity was increased sharply during wartime, it is nowhere near large enough to meet present demand. Further, a number of finished steel products which are in shortest supply cannot be produced on the coast because the coast lacks a complete range of rolling mills. At present, all eastern mills have withdrawn from the coast market. For many months now, no steel from the East has been coming westward.

Effect of this situation on housing in particular was demonstrated by the report that 20 per cent of the nation's veterans home building is planned for the West Coast, but with a normal supply of steel only 5 per cent can be built. And steel supplies now are far from normal.

The shortage will be intensified furthermore next year when Columbia Steel Corp. closes its Sheet Steel Division in Contra Costa county, Calif., for the first six months of 1947 to install new facilities. At present, Columbia is the major sheet steel supplier on the coast.

Moreover, Columbia's sheet steel production for the rest of this year already is allocated to a few large users, leaving the plight of most fabricators more serious than normally. Therefore, the committee pointed out, the major aid will have to come from eastern mills. If supplies from there are not forthcoming, it was said by James T. Taylor, president of the steel warehouse distributors' organization, approximately 95 per cent of the sheet metal fabricators in the San Francisco area would be forced to lock up shop.

In response to the West Coast plea for steel, Housing Administrator Wilson Wyatt and the Civilian Production Administration offered an alternate plan. They proposed to allocate only 50 per cent of the steel output of Columbia Steel's West Coast plant to nationwide distribution, instead of the present 100 per cent allocation to the 48 states. The



GUIDED MISSILES: Development of Ground-to-Air Pilotless Aircraft, or GAPA, has been announced by Boeing Aircraft Co., Seattle, and the Air Materiel Command, Army Air Forces, which are now testing the missiles at Wendover, Utah, located in the Great Salt desert. The missiles, which accelerate to supersonic speeds within a few seconds after take-off, have been developed as a defense against either enemy aircraft of other propelled missiles. The picture at left shows two Boeing engineers preparing to track the course of GAPA through a camera-recording theodolite which will measure the projectile's course. View at right shows GAPA as it leaves the ground for its supersonic flight

result will be, the Washington agencies said, to give California the full 50 per cent of Columbia's production.

The San Francisco committee, however, called the Wyatt-CPA proposal inadequate. They reiterated that additional supplies from the East are the only means of preventing widespread plant closings. The group also said that under the Wyatt plan there is no curtailment of military orders, and that it is understood one military order will virtually pre-empt all of Columbia's fourth quarter output.

Meantime, Columbia Steel is operating at full capacity under government directives as to distribution. Its position in the controversy is hardly an enviable one because its production must be placed where the federal agencies decree.

It is also pointed out that steel shortages exist all over the country. Allocations of eastern steel to the West Coast will result in distress in other parts of the country. Some observers believe that if the West Coast continues to exert pressure in greater degree for a readjustment, the issue may become one of national proportions.

Navy Attempting To Dispose Of Scrap Stored at Honolulu

SAN FRANCISCO

Reports from Honolulu are that the U. S. Navy is intensifying its efforts to dispose of a huge pile of scrap metal. Containing both ferrous and nonferrous material, the accumulation was built up during the war until it reached nearly 100,000 tons. Nearly a fifth of the supply has been sold and shipped, but an estimated 80,000 tons still remain.

Biggest obstacle to disposal of the scrap is the provision that all material must be removed within 180 days of award. Because shipping space is still scarce, and labor costs are high, contractors are not eager to bid. The present offer is being held open until Sept. 27.

Warehouseman Surprised by Appearance of Job Seekers

LOS ANGELES

The manager of one of the largest steel warehouses in Los Angeles reported last week that upwards of 15 job applicants had appeared recently at the company's plant within a five-day period seeking jobs.

"This is something new hereabouts," he said. "I have heard of no similar occurrences since before the war. I took the trouble to talk to most of these men, even though all of them were not hired. Most of them, I found, were newcomers to southern California. All but one or two had had experience in some branch of the steel industry before arriving here from the East.

"Two expressed what was considered a rather remarkable attitude toward employment. They insisted upon being hired 'because you've got a big plant here and you'll probably need us before this is over, anyway.' I still don't know what they meant by the phrase 'before this is over.' They all wanted top wages, however."

Two other warehouse managers said that their personnel departments also have disclosed an upturn in the number of job seekers within recent days.

Interpretations of the trend agreed only on one point: The influx of workers into southern California is still continuing.

High Wage Rates Said To Be Deterrent to New Plants

LOS ANGELES

Reliable sources who declined to be quoted by name told a STEEL reporter that there is developing in southern California a "disturbing trend" which is linked with changing policies on the part of many out-of-state concerns whose original plans were to establish production plants here but which have now changed these plans to include only assembly operations.

Reason given for the situation is the prevailing high wage rates in this area.

New Site for Shipyard Sought by Kaiser Co.

SEATTLE

In view of the government's decision that the Kaiser Co.'s lease of plant No. 3, Richmond, Calif., must terminate Sept. 30, that company is seeking a new location for its shipyard with Seattle, Portland, Oreg., and Los Angeles in prospect.

Yard No. 3 is to be sold for use as a repair plant but Kaiser officials state that restriction to this use would be uneconomical and will not fit into Kaiser's plans. Therefore, a new site for planned operations is sought.

"Just to do repair, reconversion and scrapping," says E. E. Trefethen, vice president, "puts the Kaiser Co. in a position where it cannot operate a yard of that size. To limit it to that small amount of work would not be economical." The statement criticizes the government policy of permitting any kind of work in other yards and restricting it at No. 3.

Delay on New Freight Rates Disappointing

Setback, however, will not deter Western States Council from seeking lower rates on steel

LOS ANGELES

KEEN disappointment has been expressed by Kenneth T. Norris, chairman of the Steel Committee of the Western States Council, over western railroads' postponement of a decision on establishing a lower steel freight rate from the Geneva, Utah, steel mill to Pacific Coast industrial centers.

"The federal government, the United States Steel Corp., western congressmen, senators, governors and western steel buyers through the Western States Council have jointly brought into being the basis of an entirely new western steel economy, giving to the West the hope of a more plentiful supply of steel at a lower cost," Mr. Norris pointed out. "The progress made to date in the transfer of the government-built Geneva, Utah, mill to private ownership has been encouraging.

"Western railroads have held two public hearings on the application of the United States Steel Corp., present owner of the mill, for a lower freight rate on steel from the mill to industrial centers in Washington, Oregon and California. At a third meeting held in Chicago recently they decided to postpone action on the application."

Mr. Norris said that the United States Steel Corp. has already committed itself to pass along to western consumers the proposed reduction in freight rates. He said that this action by the western railroads in effect blocks indefinitely the West's united effort to fully integrate the war-built Geneva mill into a new and enlarged western steel economy.

He emphasized that, despite this setback, the Western States Council and other interested groups will not relax their efforts to obtain a lower steel freight rate.

100 Busses To Be Purchased By Portland Traction Co.

Directors of Portland Traction Co., Portland, Oreg., have authorized purchase of 100 gas-powered busses for delivery early in 1947 from the Mack Trucks Inc., New York. Plans involve additional orders for 50 or more trolley coaches.

Men of Industry

ROBERT H. DUENNER JR.

KARL W. MUELLER

EDWARD C. LOGELIN JR.

Edward C. Logelin Jr. has been appointed director of public relations, United States Steel Corp. subsidiaries, Chicago district, succeeding **Arthur C. Wilby**, who was elected vice president, United States Steel Corp. of Delaware, Aug. 14. Since 1943, Mr. Logelin had been principal assistant to **J. Carlisle MacDonald**, assistant to chairman of the board, United States Steel Corp., New York. He has been with United States Steel since 1930, when he began in the advertising department of Universal Atlas Cement Co., New York. He became assistant to Mr. Wilby, who was then manager of public relations, Chicago district, Carnegie-Illinois Steel Corp., Pittsburgh, in 1937, and in 1941 was named assistant director of public relations, United States Steel Corp. subsidiaries in Chicago.

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Karl W. Mueller has been appointed plant manager, Reading-Pratt & Cady Division, Reading Steel Casting Division, and d'Este Division, all in Reading, Pa., of American Chain & Cable Co. Inc., Bridgeport, Conn. Mr. Mueller was formerly manager of the Erie, Pa., plant, Standard Stoker Co. Inc., New York. He is a director of Read Machinery Co., York, Pa.

—o—

Robert H. Duenner Jr., recently released from the Navy, has formed Robert H. Duenner & Co., recently appointed sales representatives in Tulsa, Okla., for Lukens Steel Co., Coatesville, Pa., and subsidiaries, By-Products Steel Corp., and Lukenweld Inc. The Duenner organization will represent the three companies in Oklahoma, Kansas, Colorado and in Missouri, west of State Highway 65. Prior to the war, Mr. Duenner was with Bethlehem Steel Co., Bethlehem, Pa., in its Tulsa sales organization. He joined Bethlehem in 1939.

—o—

Walter R. Hutchinson has been appointed assistant to the chairman, Vice Adm. William Ward Smith, USN (Ret.), of the United States Maritime Commission. Mr. Hutchinson had been with the Department of Justice as a special assistant to the attorney general, handling special assignments.

—o—

Bennett Burgoon has been appointed district manager of the new central district, Kennametal Inc., Latrobe, Pa. The central district is a consolidation of the former Detroit and Cleveland Kennametal sales districts. Mr. Burgoon, who has been district manager of the Detroit area, will supervise activities of the company's Cleveland and Toledo, O., branch offices from his district headquarters office in Detroit. **Thomas O'Connell** has been appointed agent for the South Atlantic district for the Kennametal company. The district consists of North Carolina and sections of the states of South Carolina, Georgia, Tennessee, Kentucky and Virginia. Mr. O'Connell will have offices in Asheville, N. C. **Alfred A. Anderson** has been placed in charge of the Baltimore office of Kennametal Inc.

—o—

Philip Kearny, a founder and president of K-G Welding & Cutting Co. Inc., New York, has retired after 32 years of service. Air Products Inc., Detroit, has acquired the capital stock of the company, but K-G will continue to operate under its own corporate identity as a subsidiary. **Chester T. Price**, chairman of the executive committee of Air Products Inc., has been elected president of K-G Welding & Cutting Co. Inc., to succeed Mr. Kearny. Mr. Kearny will be available as a consultant to the new management. **George L. Quarles** has been elected vice president and general manager of K-G. Mr. Quarles had been one of the managers of the Welding Equipment & Supply Division, National Cylinder Gas Co., Chicago. **Woodrow S. Boedecker** has been appointed manager of production and design for K-G. He was engineer of welding and cutting equipment design, Bastian-Blessing Co., Chicago.

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J. L. Onderdonk has been appointed an assistant vice president, American Car & Foundry Co., New York. He will continue to make his headquarters at the ACF Chicago sales office. He has been with the company since 1912.

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Edward E. Schultz has been appointed to the engineering staff of Cook Research Laboratories, a new division of Cook Electric Co., Chicago. The laboratories will be devoted to major physical problems involving industrial processing and instrumentation. Mr. Schultz will assist in directing research on transient motor measuring instruments, flow controls, pressure switches, and aircraft controls involving electronic, hydraulic and mechanical systems. During the war, he was chief engineer of Press Wireless Inc., Chicago, and Radio Craftsmen, Chicago.

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Victor Voigt has been appointed chief engineer, Bunell Machine & Tool Co., Cleveland. He had been assistant chief engineer in charge of design.

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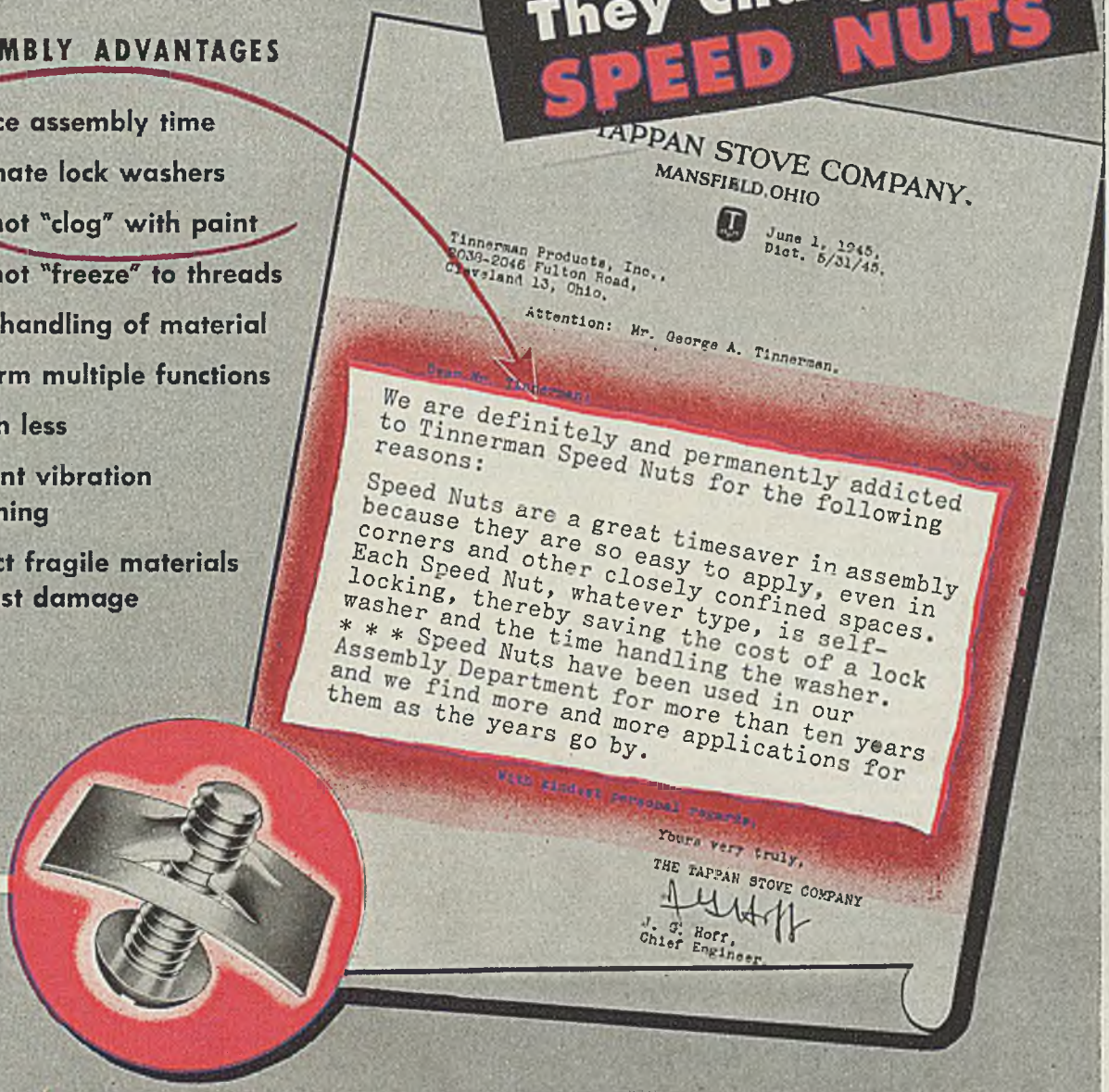
F. D. Smith has been appointed assistant to the general manager of sales, Oil Well Supply Co., Dallas, Tex., a sub-

Let SPEED NUT USERS TELL YOU WHY . . .

They Changed to SPEED NUTS

ASSEMBLY ADVANTAGES

- Reduce assembly time
- Eliminate lock washers
- Will not "clog" with paint
- Will not "freeze" to threads
- Save handling of material
- Perform multiple functions
- Weigh less
- Prevent vibration loosening
- Protect fragile materials against damage



TAPPAN STOVE COMPANY.
MANSFIELD, OHIO

June 1, 1945.
Dict. 5/31/45.

Tinnerman Products, Inc.,
2038-2046 Fulton Road,
Cleveland 13, Ohio.

Attention: Mr. George A. Tinnerman.

Dear Mr. Tinnerman:

We are definitely and permanently addicted to Tinnerman Speed Nuts for the following reasons:

Speed Nuts are a great timesaver in assembly because they are so easy to apply, even in corners and other closely confined spaces. Each Speed Nut, whatever type, is self-locking, thereby saving the cost of a lock washer and the time handling the washer. * * * Speed Nuts have been used in our Assembly Department for more than ten years and we find more and more applications for them as the years go by.

With kindest personal regards,

Yours very truly,
THE TAPPAN STOVE COMPANY
J. G. Hoff,
Chief Engineer.

Chief Engineer J. G. Hoff's complete letter lists eight reasons why he is "permanently addicted" to SPEED NUTS. But let's emphasize only two.

With SPEED NUTS the screws start easier and the nut pulls down faster, for there's no installation torque until the last few turns. No wrenches are used—only light finger pressure is necessary. What a relief when fastening parts in close quarters! SPEED NUTS also do away with buying, stocking and applying lock washers. The exclusive, spring-tension lock does a better holding job and even prevents damage to fragile materials.

From toys to trucks and airplanes, SPEED NUTS have improved the assembly of countless products and cut costs. Why can't they do the same for you? Write for test samples, describing your assembly details, for SPEED NUTS are made in over 3,000 shapes and sizes.

TINNERMAN PRODUCTS, INC. • 2039 FULTON ROAD • CLEVELAND 13, OHIO

In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario
In England: Simmonds Aerocessories, Ltd., London
In France: Aerocessoires Simmonds, S. A., Paris
In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne

Speed Nuts* PATENTED

* Trade Mark Reg. U. S. Pat. Off.

THE FASTEST THING IN FASTENINGS

sidiary of United States Steel. Mr. Smith has been with the company for 18 years. He represented it in Kentucky, Pennsylvania and Michigan before becoming Eastern Division manager in 1941. **C. M. Wittum** has been appointed Eastern Division credit manager for the company, and will have offices in Columbus, O. Mr. Wittum has been with the company for 12 years, and was district credit manager at Columbus before joining the Navy. Since his return early this year, he had been assistant division credit manager. **John E. Miller** has been named machinery service manager of the company's general sales department in Dallas. He began his Oil Well Supply Co. career as a student engineer in 1933, and later served in Kansas, Wyoming and Canada for the company.

—o—

Charles Kramer has retired as district manager, Waverly plant, Newark, N. J., United States Steel Supply Co., Chicago, subsidiary of United States Steel Corp., New York. He has been succeeded by **William J. Norman.** Mr. Kramer joined U. S. Steel in 1900, with Carnegie-Illinois Steel Corp. in Pittsburgh. He was located in the Waverly plant since 1907. Since 1940, he has served as president of the New York chapter of the American Steel Warehouse Association. Mr. Norman joined U. S. Steel in 1912. In 1939 he became associated with the Waverly plant, where he advanced to the position of assistant district manager, the post he held at the time of his new appointment.

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E. L. Jackson and **M. J. Anderson** have been appointed assistant sales managers, Air Tool Division, Aro Equipment Corp., Bryan, O.

—o—

Martin C. Delaney, secretary and treasurer, Southern States Iron Roofing Co., Savannah, Ga., has been elected a director of the company. Mr. Delaney was formerly administrative assistant to the comptroller of Rheem Mfg. Co., New York. Previously he had been associated with the Bank of New York. **E. C. Boyce** has been promoted to the position of director of advertising of Southern States Iron Roofing Co. He joined the company in 1940, and served as assistant to the vice president of sales, advertising manager, and most recently manager of advertising and mail order sales.

—o—

Henry H. Young and **Price Davis Wickersham Jr.** have joined the technical staff of Midwest Research Institute, Kansas City, Mo. Their initial project will be the application of chemical engineering and electrons in the institute's engineering mechanics section. Mr. Young was recently released from the Army. Mr. Wickersham was a project engineer in the armament laboratory, Wright Field, Dayton, O.

—o—

Charles O. Hardy, vice president in charge of research, Federal Reserve Bank, Kansas City, will join the staff of the Chicago Association of Commerce, as economist, on Oct. 1. From 1924 until the end of 1943, Dr. Hardy was a member of the research staff of the Institute of Economics of Brookings Institution, Washington. During the last 2 years of that period, he was loaned to the Office of Alien Property Custodian to act as economic adviser.

—o—

F. S. Austin has been appointed manager, purchases and stores, with headquarters at New York, of New York Central System, Pittsburgh & Lake Erie Railroad Co., Indiana Harbor Belt Railroad Co., Chicago River & Indiana Railroad Co., and Chicago Junction Railway. The following appointments have been made by New York Central System, Indiana Harbor Belt Railroad Co., Chicago River & Indiana Railroad Co., and Chicago Junction Railway: **A. L. Prentice,** general purchasing agent, with headquarters in New York; **F. J. McMahon,** general supervisor of stores, with headquarters in Collinwood, O.; **G. M. Wright,** manager, scrap and reclamation, with headquarters in Ashtabula, O.; and **T. P. Lynch,** assistant general purchasing agent, with headquarters in New York.

—o—

Laurence W. Clarke has been promoted to general sales manager, Philip Carey Mfg. Co., Cincinnati. He has been succeeded as New York branch manager of the company by **David P. Seaman,** who was formerly an assistant branch manager.

—o—

O. E. Thomas has been appointed regional director of the 15th Region, Cleveland War Assets Administration. He will direct disposal of government owned surplus property in northern Ohio and western Pennsylvania. Mr. Thomas succeeds **S. G. Backman,** who has been promoted to administrator with headquarters in Chicago. Mr. Backman will supervise WAA activities in 11 midwestern states. **John A. Pucel,** a veteran Reconstruction Finance Corp. executive, will work with Mr. Thomas as associate regional director. Mr. Thomas was recently released from the Army.

—o—

Richard W. Miller has been appointed district sales manager in charge at Chicago, Columbia Tool Steel Co., Chicago Heights, Ill. He will have full charge of the sales office, sales department and warehouse operation in Chicago. Mr. Miller joined the company in 1929, and had been with the sales and warehouse departments of the Cleveland office. Recently he had been assistant manager at Cleveland.

—o—

Howard B. Cary has joined the staff of Battelle Memorial Institute, Columbus, O., where he will be engaged in research in controlled atmosphere welding and aircraft tube welding. He had been a process engineer with Fisher Body Division, Detroit, General Motors Corp. He is a member of American Welding Society. **Archie L. Walters** has been named to the staff of Battelle Memorial Institute, and will be engaged in research in the Steel Processing Division. Before joining Battelle, Mr. Walters was a metallurgist with the Springfield, O., plant, International Harvester Co., Chicago. He is a member of American Society for Metals.

—o—

J. Marcus Greer, of Louisville, has been appointed district manager in Kentucky for Civilian Production Administration, succeeding **Henry Edson** who resigned from government service to reenter business in New York. Mr. Greer served with the district office of the War Production Board in Louisville from 1942 until its closing in December, 1945. He returned to government service early this spring as assistant district manager in the Louisville office of CPA, under Mr. Edson.

—o—

J. M. G. Fullman has retired as general design engineer, National Electric Products Corp., Pittsburgh. He had been with the company over 33 years, of which more than a third was as works manager of the Ambridge, Pa., plant. Mr. Fullman served for more than 10 years as National Electric works manager, and in 1927 was appointed general design engineer. During his affiliation with National Electric, Mr. Fullman has been a member of American Society for Metals, American Society for Testing Materials, and American Welding Society.

—o—

Everett G. Ackart has retired as chief engineer, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. He has been succeeded by **Granville M. Read,** who had been assistant chief engineer of the company since 1943. Mr. Ackart joined Du Pont in 1907 as a junior engineer. He became chief engineer of the company in 1927. Mr. Read joined Du Pont in 1915, and in 1919 became a junior engineer in the Wilmington office. In 1926 he became head of industrial engineering at the company's Chambers

Are your Corrosion Problems

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Everyone knows that Stainless is ideal for handling nitric acid—but what about corrosion from these other chemicals? Eastern's Technical Staff answer questions like these every day. Sometimes the answer can be found only with test sheets; more often the experience for which Eastern technical men have gained their esteem provides a rapid, accurate solution to the problem. And much basic, useful information on the corrosion resistance of all types of Stainless Steel is in the new complete catalog "Eastern Stainless Steel Sheets." Write for your copy. JMLco E-FF1

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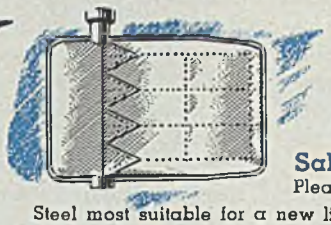
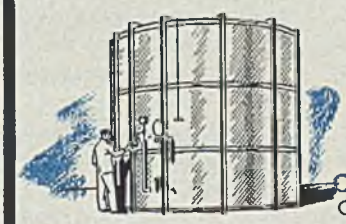


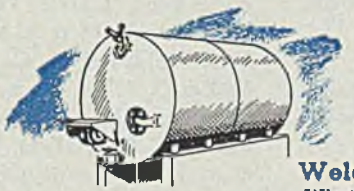
Salt Water?
Please suggest the type of Stainless Steel most suitable for a new line of highest-quality marine trim, including rudders and stabilizer fins.

Fruit Juices?
Will E-S 18-8 Stainless (Type 302) canning reservoirs be all right for handling citrous fruit juices including lemon juice?

Boiling Peroxide?
For a new oxidation process using boiling concentrated hydrogen peroxide, would low-carbon E-S 18-8 stainless (Type 304) containers be resistant?



Chloride Storage?
Our processing involves storing cold alkali-metal chloride solutions (aqueous) in E-S 18-8 stainless tanks. How can we inhibit pitting at the liquid line?



Welded Vessels?
What type of Stainless would you recommend for large all-welded autoclaves to handle reactions of maleic anhydride in making synthetic resins?

ES

EASTERN STAINLESS STEEL CORPORATION
BALTIMORE 3, MARYLAND

works at Deepwater Point, N. J. He was appointed assistant manager of the Industrial Engineering Division in Wilmington in 1930. Mr. Read is a director of Remington Arms Co. Inc., Bridgeport, Conn., affiliated with the Du Pont company.

—o—

Dr. R. S. Dean, who resigned effective Aug. 31 as assistant director of the Bureau of Mines, has organized a private consulting business with office and laboratory in Washington. Among his activities will be the commercial production of electrolytic manganese, chromium and other metals.

—o—

Col. John Slezak received the Oak Leaf Cluster to the Legion of Merit on Aug. 27, for his services in directing the procurement program of the Chicago Ordnance District during the war and contract terminations after victory. Called to active duty with the district shortly after the outbreak of war, and becoming its chief in June, 1944, Col. Slezak retired Jan. 16 of this year to the presidency of Turner Brass Works, Sycamore, Ill. Presentation was made in Chicago by **Lt. Gen. Levin H. Campbell Jr.**, former chief of ordnance, and now vice president, International Harvester Co., Chicago.

—o—

Clarence H. Collier Jr. has been appointed manager, Industrial Lift Truck Eastern Division, Hyster Co., Portland, Oreg. He will have headquarters in Peoria, Ill. Mr. Collier is an engineer, and has been with the company for many years.

—o—

Robert E. Segerdell has been appointed office manager, San Francisco office, Hercules Powder Co., Wilmington, Del. He succeeds **Cliff A. Mace**, who will remain in San Francisco until Jan. 1, 1947, when he will be transferred to the Hercules explosives department offices in Wilmington. Mr. Segerdell joined Hercules in 1937 in New York, to handle the export of explosives and naval stores. In 1941, he was appointed chief clerk of the explosives department in the New York office, and in January, 1945, was made assistant office manager there. He held that position until his present appointment.

—o—

William H. Lang has been named assistant treasurer and credit manager of the eastern area, Carnegie-Illinois Steel Corp., Pittsburgh, subsidiary of United States Steel Corp., New York. He fills the vacancy created by the recent death of **Ralph J. Phipps**. Mr. Lang joined Carnegie Steel Co. in 1934. He has been employed in the treasury department of that company and its successor, Carnegie-Illinois Steel Corp., since that time. In 1943, he was made assistant credit manager for the eastern area. He has been succeeded in that position by **Orrin E. Barnum**, who had been a credit representative. Mr. Barnum joined the treasury deparment of Carnegie-Illinois in 1945.

—o—

Norman L. Favors has been named central district sales manager, Paraffine Companies Inc., San Francisco, succeeding **E. F. Seagrave**.

—o—

Harry Keisler has been appointed vice president and manager of all operations of Dulien Steel Products Inc. of Washington, Seattle. He has been with the company 10 years. **Gilbert E. Rosenwald** has been appointed assistant manager and assistant secretary of the company. He has been with the company several years.

—o—

Norman S. McCausland, for seventeen years assistant treasurer, Atlantic Refining Co., Philadelphia, has been elected to the board of directors and named treasurer of the company, to replace **Paul Shuman** who died recently. Mr. McCausland joined the firm in 1917, as secretary to the treasurer.

—o—

L. B. Schwellenbach, Secretary of Labor, has enlarged to eight members the Federal Committee on Apprenticeship, national labor-management policy making body on apprentice training, and appointed the following five new committeemen: **Claude Putnam**, president and treasurer, Markem Machine Co., and F. A. Putnam Mfg. Co., Keene, N. H.; **Walter C. Folley**, director of training and education, Ford Motor Co., Dearborn, Mich.; **F. L. Rayfield**, president, Potter & Rayfield Inc., Atlanta; **C. J. Haggerty**, secretary-treasurer, California Federation of Labor, San Francisco; and **James B. Carey**, secretary-treasurer, Congress of Industrial Organizations, Washington. The following three members of the old four man committee have been reappointed: **John P. Frey**, president, metal trades department, American Federation of Labor, Washington; **William L. Batt**, president, SKF Industries Inc., Philadephia; and **Clifton Golden**, Congress of Industrial Organizations, Pittsburgh. **Layton S. Hawkins**, chief, trade and industrial education, U. S. Office of Education, will remain with the committee as consultant representing educational interests.

J. DONALD ZAISER

Who has been elected president, Ampco Metal Inc., Milwaukee, noted in STEEL, Sept. 2 issue, p. 92.

—o—

Emil G. Holmberg has been appointed consulting metallurgist for Alloy Steel Products Co., Linden, N. J. For a number of years, Mr. Holmberg was research metallurgist specializing in corrosion problems at the Belle, W. Va., plant of E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.

—o—

J. Hubert Cuni has been appointed personnel director, Lodge & Shipley Machine Tool Co., Cincinnati. Mr. Cuni had been with Aluminum Industries Inc., Cincinnati, since 1932, with the exception of 3 years' service in the Navy during the war.

—o—

George H. D. Miller has been appointed chief manufacturing executive, Precision Gear Division, Foote Brothers Gear & Machine Corp., Chicago. Mr. Miller was general factory manager, Pratt & Whitney Division, United Aircraft Corp., East Hartford, Conn. He had been with United Aircraft for the last 11 years.

—o—

Clifford A. Sharpe has been appointed works manager, Gar Wood Industries Inc., Detroit. He will supervise manufacturing operations in five states. **W. Gerard Tuttle** has been named director of industrial relations of the organization. He was formerly with Consolidated Vultee Aircraft Corp., San Diego, Calif.

—o—

Erle Martin has been appointed acting general manager, Hamilton Standard Propeller Division, United Aircraft Corp., East Hartford, Conn., succeeding **Sidney A. Stewart**, resigned. Mr. Martin will retain his position as engineering manager of the division, too.

—o—

John H. MacLeod has been appointed merchandising manager, New York Division, Colonial Beacon Oil Co., Boston, marketing organization for New York and New England of Standard Oil Co. of New Jersey, New York. Since Novem-

E. J. McGEHEE

Who has been appointed sales manager, Koppers Co. Inc., Pittsburgh, noted in STEEL, Sept. 2 issue, p. 88.

L. T. WRIGHT

Who has been appointed sales manager, Bunell Machine & Tool Co., Cleveland, noted in STEEL, Spt. 2 issue, p. 88.

W. J. REAGAN

Appointed associate professor of metallurgy, Pennsylvania State College, State College, Pa, STEEL, Sept. 2 issue, p. 92.

ber, 1942, Mr. MacLeod had been operations manager of the Delaware-Maryland district, Columbia Division, Standard Oil Co. of New Jersey.

—o—

Charles Edgar Hoyt has retired from American Foundrymen's Association, Chicago. In nearly 30 years of continuous service to the association, he has held the offices of secretary, convention and exhibits manager, executive vice president, and treasurer. **William W. Maloney** has been elected secretary-treasurer of the association. He had been secretary since Aug. 1, 1945. **S. C. Massari** has been appointed technical director of the organization, and **John P. Mullen**, assistant treasurer.

—o—

Gray L. Furey has been appointed sales representative for Kentucky, southwestern Ohio, and eastern Indiana, by Titan Metal Mfg. Co., Bellefonte, Pa. His offices are in Cincinnati.

—o—

Dr. Jerome C. Hunsaker has been elected to the board of Goodyear Tire & Rubber Co. Inc., Akron. Dr. Hunsaker is head of the aeronautical and mechanical engineering departments of Massachusetts Institute of Technology.

—o—

Henry Steinhaus, of New Hope, Pa., has been appointed sales engineer for eastern Pennsylvania and New Jersey for McInnes Steel Co., Corry, Pa.

—o—

Lawson Adams has been elected secretary and a member of the board of directors of Wrought Washer Mfg. Co., Milwaukee. He has been with the company 5 years.

OBITUARIES....

Harry B. Pulsifer, prominent Cleveland metallurgical engineer, died in that city, Sept. 1. Since 1936, he had been an instructor at John Huntington Polytechnic Institute, Cleveland. He was also assistant to the president of American Metal Treating Co. in that city. Previously he had been with Ferry Cap & Set Screw Co., and American Steel & Wire Co., both in Cleveland.

—o—

Francis P. Cannon, president, Cannon-Stein Steel Corp., Syracuse, N. Y., died recently.

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Albert A. Harrison, 72, president, Borden & Remington Co., Fall River, Mass., died in Boston, Aug. 30.

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J. M. B. Hoxsey, 77, retired vice president and treasurer, Southern Bell Telephone & Telegraph Co., died recently in Thomasville, Ga.

—o—

John E. Lutz, 59, who, prior to illness, was treasurer of Burgess-Manning Co., Chicago, died recently in Madison, Wis. Prior to becoming treasurer of the company, he was purchasing agent of Burgess Battery Co., Freeport, Ill., for 21 years.

—o—

Harvey P. Thelen, 36, product sales manager, Steel Container Division, Continental Can Co. Inc., died recently in New York.

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Stephen J. Babusek, 57, owner of the Star Aluminum & Brass Foundry, Chicago, died in that city, Sept. 1.

—o—

John W. Ellis, 70, founder and chairman of Chemical Supply Co., Cleveland, died in that city, Sept. 3. He had retired from active work in the company 15 years ago, but had maintained his executive position as chairman of the board.

—o—

Philip Henry Waddell Smith, 77, former vice president, General Cable Corp., New York, died at his home in Princeton, N. J., Aug. 31. He retired from business in 1930.

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Earle Frederick Sells, 59, a sales manager for Westinghouse Electric Corp., Pittsburgh, died recently in Washington. He had been with the corporation since he was a young man. He became manager of the Washington office in 1932, and 8 years later was named special government representative for Westinghouse.

—o—

Dr. Alexander Russell Stevenson, 53, who was in charge of educational and training programs for General Electric Co., Schenectady, N. Y., died in that city, Aug. 28. As staff assistant to the vice president in charge of engineering policy, Dr. Stevenson, who joined the company in 1917, directed the training of engineering personnel and studied the development of new products.

—o—

John J. Stone, 59, special products engineer and specialist in the development and production of armor plate, Bethlehem Steel Co., Bethlehem, Pa., died in Brandon, Vt., Aug. 31. He joined Bethlehem as an assistant foreman in the armor plate department.

—o—

Ward Bent Marvell, 46, assistant to the president of Carl L. Norden Inc., New York, until his retirement last January, died recently at his home in La Mesa, Calif.

Pneumatic fatigue test

Details presented on a method for fatigue testing gas turbine buckets apply to a wide variety of parts subjected to reversed bending stresses. This subject was discussed recently before ASTM and Society for Experimental Stress Analysis

DURING the war, General Electric Co. was forced to make fatigue tests on gas turbine buckets, because a correlation between standard test specimens and actual bucket performance was very difficult to obtain. While experience in this work was largely with gas turbine buckets, it seems that the difficulty applies to a wide variety of parts that are subjected to reversed bending stresses.

Roughly speaking, the buckets have a crescent-like cross section. In precision cast buckets, the metal usually has a finer grain structure at the points of the crescent than in the heavier mid-section. Grain structure has a pronounced effect on the fatigue strength and it is determined by the shape of the cast part; consequently, fatigue tests on actual buckets become a necessity.

Under operating conditions, the buckets are subjected to periodic disturbing forces as they pass through regions of alternately high and low gas pressures. In view of this, it was logical to vibrate these buckets with an interrupted air stream.[1]

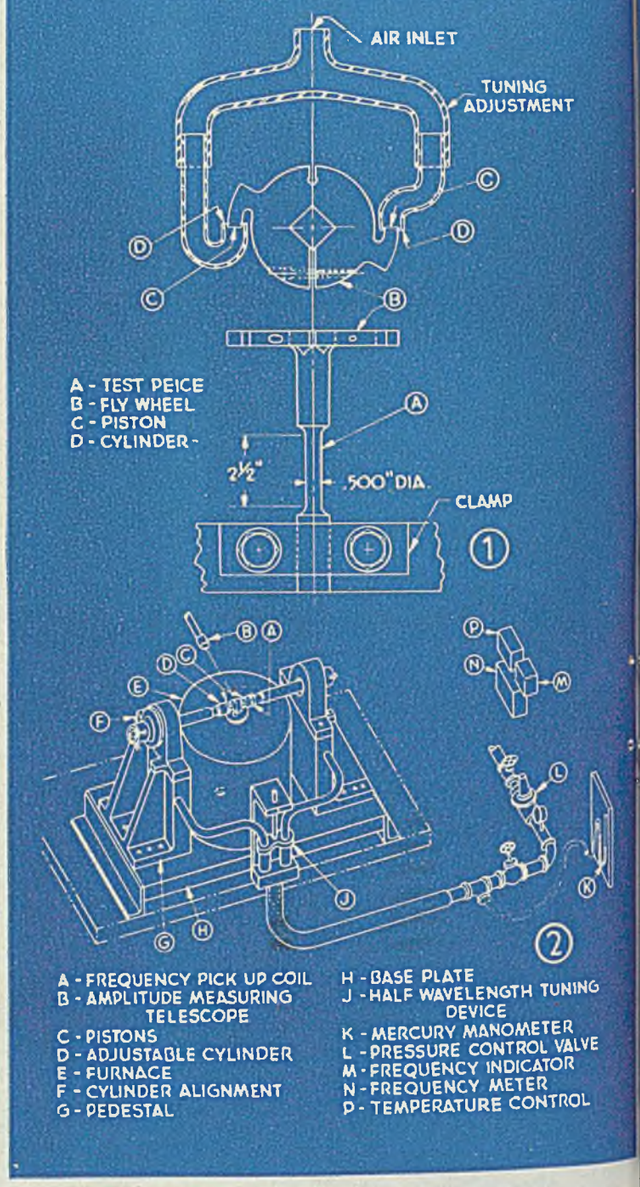
First Machine: The first try was crude but encouraging. It consisted of welding a bucket (A) to a 1-in. bolt head (B) and bolting it firmly to a heavy steel plate (C). Note Fig. 4. A short rigid piston (D) is mounted on the upper or free end of the bucket. Axis of the piston is at right angles to the center line of the bucket and lies in the plane of vibration of this center line. A cylinder (E), mounted on a vertical support (F), is coaxial with the piston (D) and is adjustable along a line corresponding to the axis of the piston. Clearance between the piston (D) and the cylinder (E) is just sufficient to prevent contact under operating conditions.

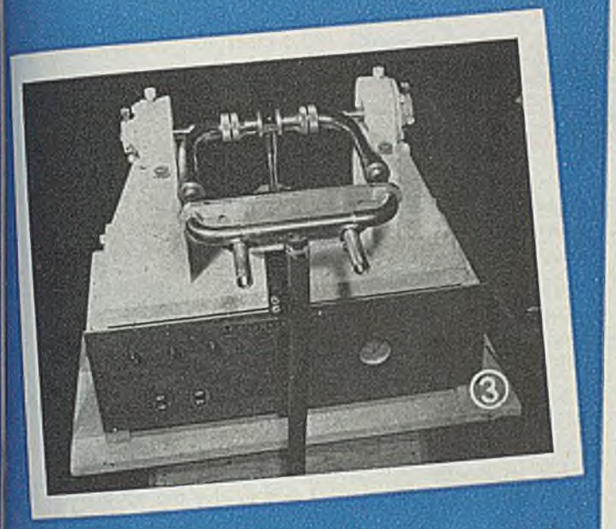
Cylinder is adjusted so its open end and the face of the piston lie in approximately the same plane. A steady stream of air is admitted to the cylinder, and the pressure is increased until the piston is forced away from the cylinder. When this occurs, the gap between the piston and the cylinder increases, which in turn causes the air pressure in the cylinder to drop. Spring action of the bucket, acting as a cantilever, then forces the piston back into the cylinder and the cycle is repeated. It is obvious that frequency of this cycle is determined by the natural frequency of the cantilever. Amplitude of vibration is governed by air pressure.

Bucket is heated by placing a cylindrical, resistance-wound furnace around it and closing the upper end with an asbestos cover. The piston support protrudes through an opening in the cover, and an air deflector is put under the piston to prevent air from blowing down into the furnace. Furnace temperature is controlled by a thermocouple cemented or spotwelded to the bucket near the region of maximum stress.

Amplitude of vibration is measured optically, and the frequency is indicated by an electronic frequency meter with a magnetic pick-up device.

The machine worked fairly well. The bucket and piston assembly had a natural frequency of approximately 250 cycles per second or 900,000 stress reversals per hour. Stresses were produced up to 80,000 psi at a total amplitude of 0.200-in. When testing at low stresses, however, below 20,000 psi, amplitude was difficult to control. The axial position of the cylinder was very critical; also, the amplitude would suddenly increase and then drop back to normal and repeat this in a fairly rhythmic manner. This variation was noticeably in step with a very low frequency beat note. Later it was discovered this was the result of two frequencies, the resonant frequency of the bucket assembly, and the resonant frequency of the air column in the cylinder.





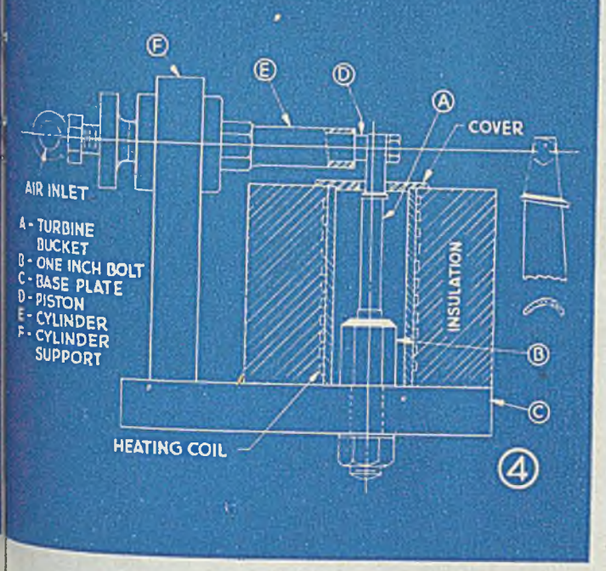


Fig. 1—Torsional fatigue machine

Fig. 2—Opposed-cylinder type pneumatic fatigue tester

Fig. 3—Front top view of pneumatic fatigue tester

Fig. 4—Single-cylinder pneumatic fatigue tester

Later Development: In order to make a more stable machine, an opposed cylinder-type driving mechanism was developed. Its operation is the same except that the bucket receives an impulse every half cycle instead of every cycle. In Fig. 2, the two cylinders (D) are connected to a common manifold, and this receives air held at constant pressure, from a pressure control valve (L). The total air path or the distance from one cylinder mouth to the other (C around through J to C) was made equal to one-half a wave length, at the frequency of the bucket assembly; thereby putting the air impulses 180 degrees out of phase.

This machine produces stresses up to 100,000 psi with approximately one fifth the amount of air used in the original machine. Sudden increase in amplitude noticed during the aforementioned beat note effect was put to good use. When the air pressure impulses are tuned to come at the precise instant that the piston (C) is entering the mouth of the cylinder (D), the driving force is increased many times. For instance, at an amplitude producing a stress of 40,000 psi, it is now possible to reduce the air pressure from 20 psi to 2 psi. The amplitude is remarkably steady and may be varied by adjusting the air pressure. Fig. 2 shows sliding tube arrangement (J) for increasing or decreasing length of air path.

In going from ambient temperature to 1350° F, the bucket frequency drops from 250 cycles per second to approximately 210 cycles per second (this change varies within the alloy), necessitating a change in the total air path as follows:

$$\frac{1100 \text{ fps}}{250 \text{ cps at } 250 \text{ cps}} = 4.4 \text{ ft or } 2.2 \text{ ft for } \tfrac{1}{2} \text{ wavelength}$$

$$\frac{1100 \text{ fps}}{210 \text{ cps length at } 210 \text{ cps}} = 5.25 \text{ ft or } 2.625 \text{ ft for } \tfrac{1}{2} \text{ wavelength}$$

Total increase in air path is 0.425 ft or 5.1 in.
1100 fps is the velocity of sound through air.

An electric furnace was designed which allows tests to be made with a bucket temperature of 1700° F.

By altering the design of the support, most any standard test piece may be run in the machine.

This type of fatigue testing machine has no parts to wear out as nothing moves but the piece to be broken. It is also an extremely easy machine to operate. The cylinders are mounted on ball seats (F) so they may easily be aligned with the pistons. On the end of each cylinder is an adjustable sleeve (D) allowing the operator to effectively back off the cylinder as the amplitude is increased. Mounted on one of these sleeves is a small coil of wire (A) and a magnet used for measuring the frequency.

When the bucket fails, it ceases to vibrate and this produces a slight increase in the manifold pressure. A mercury manometer (K) responding to this pressure rise closes a contact which in turn operates relays that shut the machine down and cut off a cycle counting mechanism.

Current work in this field is giving preliminary data which indicate that by using a recording frequency meter the chart will show what appears to be a point of incipient failure. The chart is also a permanent record of the frequency and time of run.

The curve is flat at a constant (*Please turn to Page* 150)

Determining Selling Prices *for industrial products*

Survival of any company in today's competition will depend substantially upon effective estimating of costs

PRINCIPAL purpose of estimating costs in industry is to aid in determining the proper selling price for a company's product. If estimates and prices are too high, it will be impossible to obtain business in competition; if prices are too low, the company may sell below costs and be forced out of business.

Even if equipment, methods and production per hour are the same as in prewar times, changes in the cost of material, labor and burden must be estimated. It is not likely that any plant can pick up where it left off in 1941 or 1942, as there have been so many changes, some good and some bad, since that time.

All estimating is now, more than ever, a shop problem. The war demonstrated how large quantities and long runs can be planned to minimize lost time and to obtain maximum production per hour. The size of a customer's order is a very important factor in determining cost of production. It is not possible for the average company to obtain all large orders. With the knowledge that there will be a substantial number of small orders, estimates must be made on a realistic basis, giving consideration to the number of pieces per hour that can be expected under conditions as they will probably be in actual manufacturing.

Estimates will naturally be composed of the several elements of material, labor and burden to give the total manufacturing cost. To manufacturing cost will be added provision for selling and administrative expenses and for profit to give the proper selling price.

Estimate of material will show the quantity required, and specifications as to quality, size, etc. It is well to allow a sufficient quantity of material to cover pieces spoiled in manufacturing in accordance with average experience, so that the total quantity started on the order can be expected to produce the required number of good pieces.

Price to be applied to the material should be the delivered price including inward freight, cartage, etc. It would not normally include the cost of handling and storage, as those expenses are a part of the material burden which will be considered as a separate item.

Next element to be considered under material is the anticipated quantity of scrap that will be made in the manufacturing operations, and if the price of such scrap results in a value which is significant, it should be deducted from the total material cost to give the net material cost.

Some overhead expenses or burden applicable to material rather than to labor are: Space used for storage of materials, labor and expense of receiving, handling, and delivering material to the productive departments, and in most cases, the cost of the purchasing department. Foregoing elements apply to material used in making products rather than to the labor expended; therefore these items making up material burden should be added to the estimated cost of material on some fair basis, usually as a percentage of the material cost.

Direct labor should be estimated separately for each operation. For many operations there should be a separate estimate made of the time required for setting up and taking down the dies as distinguished from the time used in making pieces. During the set-up period, labor is required and the fixed charges on the machine are applicable, but there will be a saving in the cost of certain elements such as power, repairs and supplies. For some departments or operations, the difference may be sufficient to assign a different burden rate per hour used for operating time. On machine from rate per hour used for operating time.

Estimate of operating hours will be based on the num-

This article condensed from an address by C. Oliver Wellington, partner, Scovell, Wellington & Co., New York, before members of the Philadelphia chapter of the Pressed Metal Institute should inspire every manufacturer to examine his costs more closely in the light of post-war conditions.

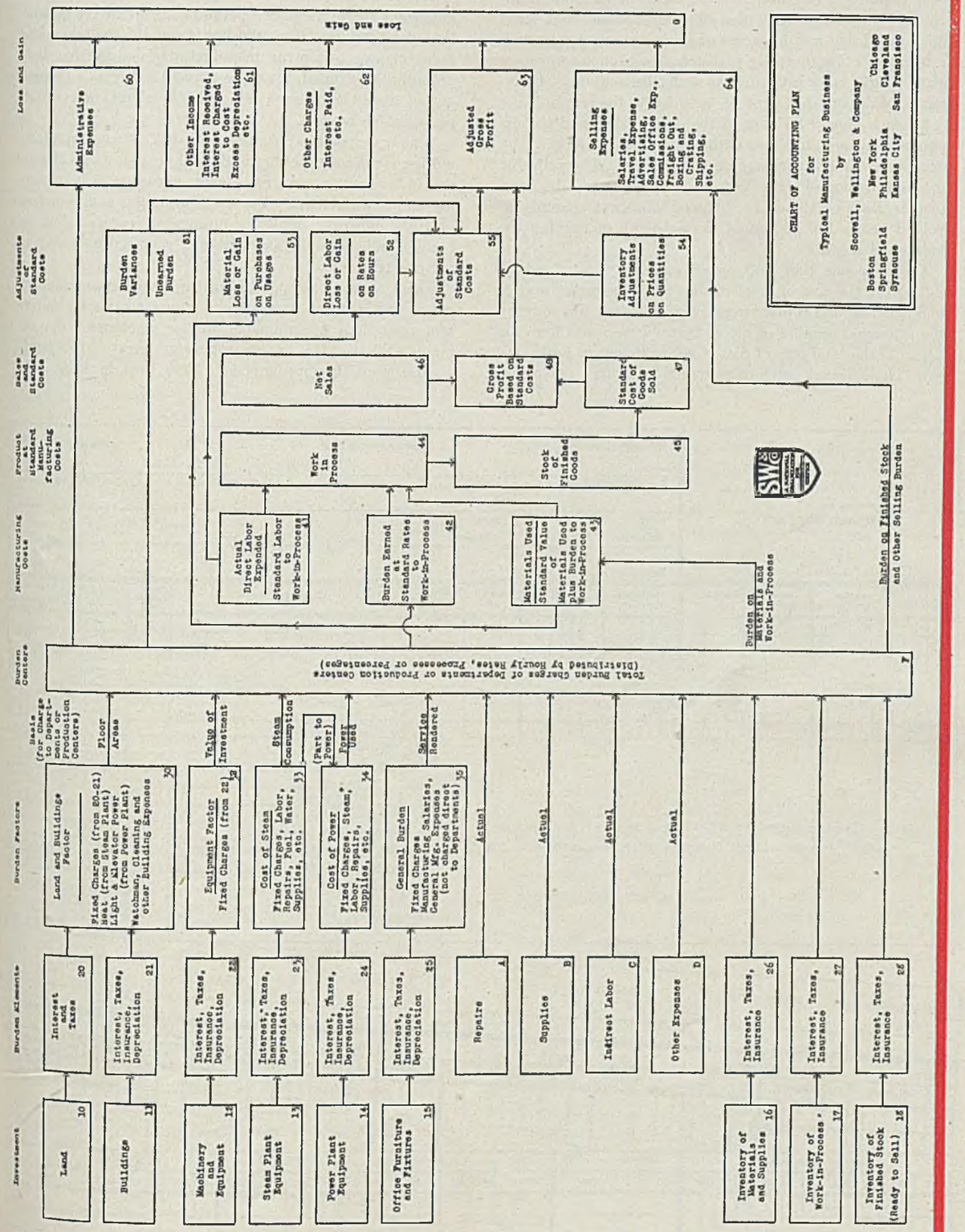


Fig. 1—Chart of accounting plan for typical manufacturing business

ber of pieces per hour that should be produced. If direct labor for the operation is not paid on a piece-work basis, then it must be calculated at an hourly rate for the type of skill required. Be sure that the total direct labor is included in costs. If the plan of compensation calls for a guaranteed day rate in excess of piece-work earnings, or if a bonus or other incentive plan requires payment in excess of the direct labor estimated as such, these additional payments of direct labor must be included in the burden.

Records should be kept of the cost of dies and the expense of upkeep, together with credits for dies paid for by customers, so that the net cost is known. Theoretically, the best method of estimating die costs is per one thousand pieces; this plan should be followed whenever amounts involved justify the additional clerical work of keeping the individual records.

Cost per one thousand pieces made is determined by estimating the cost of a set of dies and the further cost of maintenance and replacements, then dividing this total by the estimated number of pieces that will be made from the dies. If the total cost of dies is not sufficient to justify the extra clerical work, such costs should be broken down separately by classes of presses on which the dies are used, and included as one of the elements of burden of such presses.

Separate calculations of burden should be made for each important department or operation. Burden on material should be separate from the burden of the manufacturing departments. After the manufacturing burden has been properly determined, it can be applied either as a percentage of direct labor, as a rate per labor hour, or as a rate per machine hour.

Whichever method is followed will depend upon operating conditions for the individual company and the desire of its management for greater accuracy in cost keeping and in estimating. Too much grouping and averaging of costs, however, tends to obscure differences that are really significant and that will have a substantial effect on net profits.

There should be separate burden rates for each department, and in some departments separate rates for important operations or groups of similar machines. For example, the burden on an expensive press is obviously greater than the burden on (*Please turn to Page* 153)

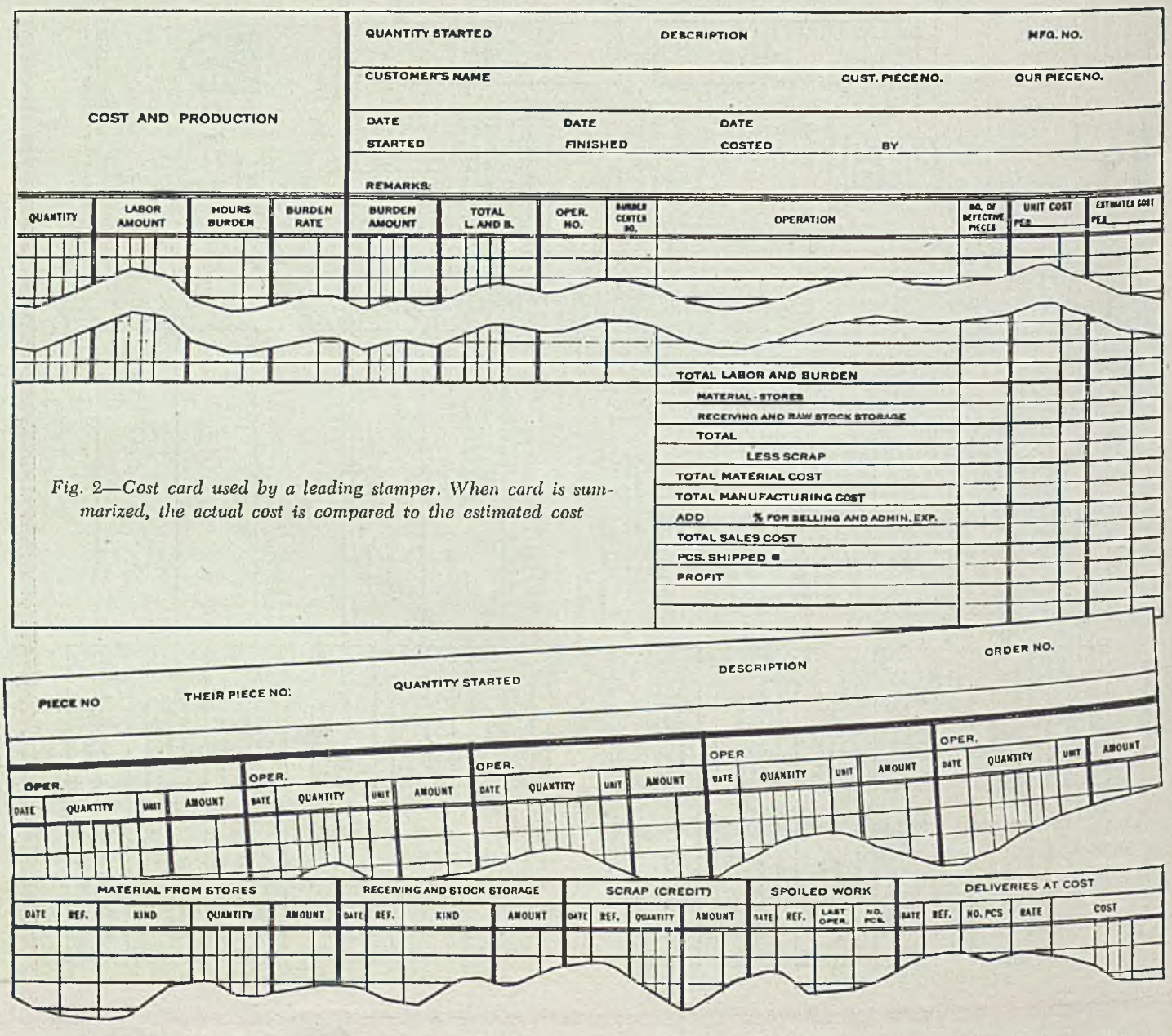


Fig. 2—Cost card used by a leading stamper. When card is summarized, the actual cost is compared to the estimated cost

By GUY HUBBARD
Machine Tool Editor

Seen and Heard in the Machinery Field

GOOD WORK GOES ON: During the war we had occasion a number of times to refer editorially to the valuable data sheets on machining methods prepared by the Manufacturing Engineering Committee of the American Society of Mechanical Engineers, 29 West Thirty-ninth St., New York 18, N. Y. These sheets were financed by, and were distributed to the metal working industry by the Office of Production Research of the War Production Board in Washington.

I was much impressed by the job done by Herbert B. Lewis, original secretary of the Manufacturing Engineering Committee of ASME, and carried forward by his successor Richard B. Smith. Both are practical shop men, both have had the active "coast-to-coast" co-operation of some of the top metal cutting authorities in this country. Great impetus thereby was given to high speed machining—milling in particular. "What," asked many satisfied clients, "will happen to this worthy cause when WPB support perforce is withdrawn?"

I have just received a letter from Dick Smith, bearing good news. The machining data sheet service is to be continued by ASME on a subscription basis, thus perpetuating the work of keeping American machine shops at the peak of efficiency, in line with the latest developments in the art of metal cutting. In the troubled world of today, can we afford to have any other kind of machine shops?

Metal cutting research actually has gone ahead faster than ever since the war ended. If you as a machine tool user want to translate results into performance, I suggest that you let Dick Smith know by getting in touch with him at ASME headquarters in New York.

CREATIVE VISUALIZING: Back in the early days of the machine tool industry it was not at all uncommon for machines to be built "right out of the heads" of their inventors. I know of one case where 50 machines of a kind were manufactured before any drawings existed—drawings finally being made from the machines.

That kind of direct translation of the mental picture of the machine into metal was possible only when machines were simple and when the inventor himself did a lot of the pattern making and shop work. Inevitably, it involved many alterations as the work progressed. It would have been much easier to rub out lines and change them on paper, than it was to chip and file metal—as often had to be done.

With all due respect to those who actually do have the power to visualize mechanical drawings in three dimensions, it is a fact that there is a growing tendency today to study new models in three dimensions before they are built. In many places I have found this being done effectively by means of wooden or modeling clay "mock-ups"—a technique long employed in the automobile and aircraft industries. Some of this work is so realistic that catalog illustrations actually are made from the "mock-ups."

However, about the slickest thing in preliminary visualizing that I have come across in many a long day is that practiced by a competent engineer who also happens to be a real genius at rapid perspective sketching of his own and his associates' creative ideas.

When a new machine is to be created, he and his associates get around a table. Everybody starts thinking, they start talking, and he starts sketching—oftentimes with a desired work piece as the starting point. Like the creator of the doughnut, who explained "that he took a hole and put some dough around it," this group—with the help of the artist-engineer actually "takes a hole and creates a machine around it."

After a prolonged session of cogitation, sketching, joint criticism, erasures and resketching, a remarkable picture of a machine yet to be built—replete in detail—is turned over to the drafting room for translation into working drawings. I have seen some of the finished machines which eventually resulted. They are almost identical in appearance to their "dream pictures." They look good and they are good!

NOISE ANNOYS: Machine shops are not as noisy as they used to be. I even have been in some tank and boiler shops lately wherein the unearthly clamor of days gone by has been considerably toned down. There is growing appreciation of equipment such as the nail machine whose builder long has emphasized that "our machines are designed to make nails—not noise".

There is growing realization that undue noise not only is "bad medicine" both mentally and physically—but also a sign of poor design and poor workmanship. As the overall noise level in shops is reduced, a noisy machine becomes all the more noticeable. The old demonstration room cover-up, to the effect that "it may sound just a trifle noisy in here, but out in the shop you hardly will be able to hear it," never was good salesmanship. Today it definitely is out.

I find that machine tool builders are right up in the forefront in the drive to eliminate needless industrial noise. They are quick to adopt the latest methods in designing and finishing gears. They spend a lot of time now redesigning indexing mechanisms and locking bolts to get rid of the crash and bump which once were all too common. Not only are they conscious of the annoyance of noise, they also are aware that to alert machinery buyers it spells undue wear and tear, wasted power and below par performance.

Noise also indicates vibration, and today vibration definitely is on the "index expurgatorius" of the machine tool industry. At least one machine tool builder builds dynamic balancing machines. More and more machine tool builders are dynamically balancing more and more parts of their machines. Increased speeds demanded by carbide tooling make this practice a must on production machinery.

It is becoming a familiar sight in machine tool plants to see a "noise and vibration doctor" in a sound proof room, going over a new model machine inch by inch with stethoscope and vibrometer. End results of his "doctoring" are efficient, long-lived machines; efficient, contented operators; good work; and profitable operations.

HEAT TREATING Aluminum

Annealing practices and cycles, difficulties and their causes are discussed in fourth of a series of articles. Concluding article next week will cover solution heat treatment and precipitation treatment

By O. L. MITCHELL
Metallurgist
Reynolds Metals Co.
Louisville

THREE types of anneals extensively used with the aluminum alloys are: Horizontal bulk anneal, vertical anneal and flash anneal. The horizontal bulk anneal is generally used when the heating rate is not critical. With this process, the material can be stacked to a depth of several inches.

The vertical anneal can be used when a fast heating rate is required. With this process, the material is spaced vertically in the furnace in such a manner that a fast but uniform heating rate is obtained.

The horizontal flash anneal is ideal for small, comparatively thin gage parts that require a fast heating rate. With this process, the material is carried through the furnace on a continuously moving conveyor, the time of the anneal being controlled by the speed of the conveyor, the length of the furnace, and the temperature of the furnace atmosphere.

Practices given in succeeding paragraphs are based on horizontal bulk annealing processes. If other types of annealing are to be employed, the practices should be changed accordingly.

Nonheat-Treatable Alloys: Such alloys as 2S, 3S, 52S and 56S, and high purity aluminum, are annealed to remove the effects of strain hardening produced by cold work. With these alloys, a 1-hour soak at a metal temperature of 650° F plus minus 15° F, is satisfactory for all except 3S. A temperature of 750° F must be used for 3S because of its higher recrystallization temperature and to insure a faster heating rate through the critical nucleation period.

Heating rate is critical for the alloy 3S, a relatively fast rate being required to produce a fine grain material. The heating rate for the other nonheat-treatable alloys is not too important for general applications.

Upper temperature limit for this class of alloys, with the exception of high-purity aluminum and 52S, is not critical. The higher temperatures promote discoloration and increase the thickness of the oxide film on 52S which contains an appreciable amount of magnesium. Because of this, the maximum temperature employed for 52S is 750° F, when maximum drawability is desired.

Time at temperature will vary depending upon temperature used, the type of anneal, thickness of the material, method of loading and similar factors. Generally, the soaking period will vary from ½ to 2 hours with a 1-hour soak being widely employed. The most satisfactory ways of determining the best soaking time are by furnace temperature surveys and by actual trial. One point that should not be overlooked when establishing minimum soaking times is that the mechanical properties may vary widely throughout a load if a critical time is employed. This may be disadvantageous for mass production operations.

Rate of cooling is not an important factor although a rapid quench is definitely not recommended due to the quenching strains set up. Air cooling will generally be found entirely satisfactory.

Heat-Treatable Alloys: The heat-treatable alloys are annealed to remove the effects of strain hardening produced by plastic deformation or to remove the effects of solution heat-treatment. To remove strain hardening due to cold work, a 1-hour soak at 640-660° F followed by air cooling is generally satisfactory. This practice is also satisfactory to remove the effects of heat treatment if the maximum degree of softness is not required.

To remove the effects of partial or full heat treatment, a 2-hour soak at 750-800° F, followed by a maximum cooling rate of 50° F per hour to 500° F, is required if maximum softness is to be obtained. However, it should be kept in mind that the use of high annealing temperatures adversely affects the drawability of the material. Diffusion of copper and other soluble constituents may also be excessive in cladded material.

To remove the effects of solution heat-treatment or hardening due to cold work, the high zinc-bearing alloy R303 should be soaked 2 hours at 675-700° F, air cooled to 450° F, and soaked 4 hours at 450° F. The stabilizing treatment at 450° F is necessary to precipitate the soluble constituents from solid solution.

Annealing of solution heat-treated material should be avoided whenever possible if subsequent forming and drawing operations are to be performed. If such operations are not severe it is generally advantageous to resolution heat treat and form in the freshly quenched condition. A moderately fast heating rate, while not essential, is desirable. If slow heating rates are employed, diffusion of copper and other soluble constituents may be excessive in clad products. There may also be a slight tendency to produce a coarse grain size.

Use of temperatures in excess of those recommended should be avoided. As previously mentioned, this group consists of alloys that contain substantial amounts of soluble constituents. To obtain optimum workability, these constituents must be out of solution, uniformly distributed and of optimum size.

When annealing to remove the effects of cold work,

Fig. 19—Photomicrographs (a) and (b) are respectively unetched and etched (with 20 per cent sulphuric acid) structures formed in as-cast 14S aluminum alloy and show the unequal distribution of various constituents. X 500

Fig. 20—Photomicrographs (a) and (b) are respectively unetched and etched (with 10 per cent sodium hydroxide) as-cast structures of 24S aluminum alloy. These various constituents present in the as-cast condition and their unequal distribution. X 500

Fig. 21—As-rolled structure of aluminum alloy 2S. Etchant HC1-HF, X 250

Fig. 22—Structure of aluminum alloy 2S as it appears when properly annealed. Etchant HC1-HF, X 250

the temperature should be high enough to insure complete recrystallization and yet low enough to prevent any appreciable solution of the soluble constituents. In addition, the precipitated constituents should be uniformly distributed and of optimum size.

Annealing to remove the effects of heat treatment requires temperatures high enough to coalesce the precipitated constituents. However, some solution of the constituents also occurs at this temperature. The slow cooling rate to 500° F is required to promote the re-precipitation and coalescence of the constituents that remain in solution after the coalescence of the constituents that remain in solution after the coalescence period.

Attempts are often made to shorten the annealing cycle for alloys such as 24S by employing temperatures in excess of those recommended. This practice should be avoided because more and more of the soluble constituents go into solution as the temperature is increased. If the material is subsequently rapidly cooled, the soluble constituents either remain in solution or are later thrown out of solution by a process known as aging. In either case, the material does not possess fully-annealed mechanical properties.

Time at temperature will vary depending upon the temperature, the type of anneal, the material, and similar factors. Excessive times at temperature promotes grain growth, diffusion and discoloration.

Cooling rate is important only when the annealing practices employed cause part of the soluble constituents to go into solution. When this occurs, the rate of cooling must be controlled to permit their re-precipitation and coalescence. Use of a cooling rate sufficiently low to allow precipitation from the solid solution, formed by the use of excessively high temperatures, results with most heat-treatable alloys in preferential precipitation and coalescence of plate like particles at and between the grain boundaries. When this condition exists, the forming characteristics of the material are seriously impaired, although the mechanical properties may be only slightly affected.

The following difficulties may be encountered when annealing wrought aluminum alloys:

Material too hard is indicated by high tensile strength or yield strength. If the percentage of elongation is low, the condition is caused by an insufficient temperature or an inadequate soak. If the percentage of elongation is normal, the condition is caused by the use of too high a temperature or a too rapid cooling rate from a high temperature.

Large grain size is indicated by an orange peel effect on the surface after forming. The condition is caused by insufficient cold work or, particularly in the case of 3S, by the use of a slow heating rate during the annealing process. Cladded material and heavy plate may occasionally show a coarse grain size on the surface.

Poor drawing properties—in conjunction with normal annealed mechanical properties. The condition is generally due to the shape and distribution of the coalesced precipitate and is caused by the use of too high an annealing temperature. *This condition is always present when solution heat-treated material is annealed.* Poor drawing properties are also obtained by the use of an improper blank size, an incorrect hold-down pressure, insufficient lubrication, and an incorrect degree of drawing.

Discoloration: Localized spots are generally oil or water stains. The use of a higher annealing temperature in the presence of air will generally remove oil stains. Severe darkening of the entire surface is an indication of an excessively high temperature or too long a soak at a high temperature. The alloy 52S is particularly susceptible to discoloration at high temperatures.

Solution Heat Treatment: The hardening and strengthening of the heat-treatable group of aluminum alloys by thermal treatment is performed by a series of operations involving the controlled heating and cooling of the material in the solid state. The purpose of the operations is to control the size and distribution of the precipitate formed by the soluble elements added to produce the alloys.

Many elements are soluble in aluminum, the more commercially important ones being silicon, iron, copper, magnesium, manganese, nickel, zinc and chromium. Some of these are soluble only in the molten state, others have an appreciable solubility at room temperature, while still others are very soluble at elevated temperatures but have restricted solubility at lower temperatures.

The heat-treatable group of alloys consists of those which contain elements, groups of elements or constituents that have considerable solid solubility at elevated temperatures and restricted solid solubility at lower temperatures. If they did not possess this decreasing solid solubility, they would, by definition and response, be classified as nonheat-treatable alloys.

The solution of one metal in another in the solid state, referred to as solid solution, is explained by the following analogy: When salt is added to water, a definite amount, depending upon the

Fig. 23—Pureclad 24S alloy as it appears when properly annealed. Note fine, well dispersed copper aluminide precipitate. Keller's etch, X 250

Fig. 24—Improperly annealed Pureclad 24S. Note the coarse, poorly-dispersed copper aluminide precipitate. This type of structure is associated with poor forming characteristics. Keller's etch, X 250

Fig. 25—Grain boundary precipitation in aluminum alloy 24S-O. This micrograph shows typical particle size and distribution of microconstituents resulting from an excessively high temperature slow-cool anneal. The plate-like precipitate is located at grain boundaries. Etched with 0.5 per cent hydrofluoric acid, X 500

WHAT KIND OF ROLLS ARE YOU GRINDING?

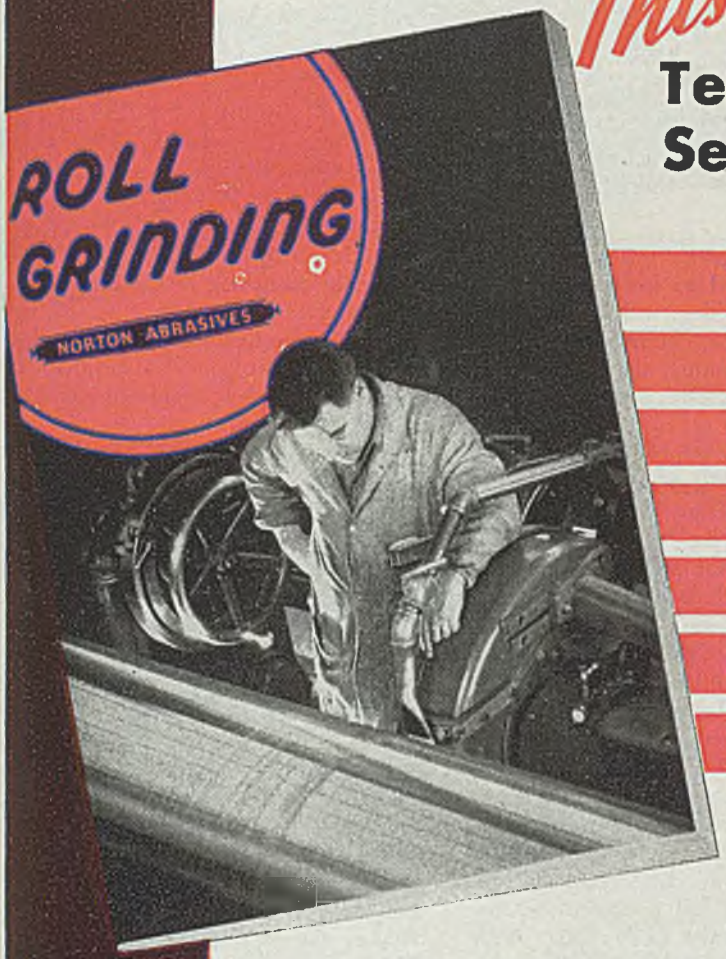


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TABLE I
ANNEALING CYCLES

Alloy	To Soften After Heat Treatment* Soaking Temperature °F	Soaking Time Hours	Cooling Rate**	To Remove Cold Work Soaking Temperature °F	Soaking Time Hours	Cooling Rate**
2S		Not Heat Treated		650 ± 15	½—2	A or B
8S		Not Heat Treated		750 ± 15	½—2	A or B
14S	775 ± 25	2	B	650 ± 10	½—2	A
17S	775 ± 25	2	B	650 ± 10	2	A
24S	775 ± 25	2	B	650 ± 10	2	A
Pureclad 24S (Alclad)† (24S)	775 ± 25	2	B	650 ± 10	2	A
52S		Not Heat Treated		650 ± 10	2	A or B
R301 (Alclad)† (14S)	775 ± 25	2	B	650 ± 10	2	A
R303 (75S)	685 ± 15	2	C	685 ± 15	2	C
R317	775 ± 25	2	B	650 ± 10	2	A
R353 (53S)†	775 ± 25	2	B	650 ± 10	2	A or B
R361 (61S)†	775 ± 25	2	B	650 ± 10	2	A or B

* Maximum drawability cannot be obtained without mechanical work and subsequent re-annealing.

** Annealing cooling rates: A — Air cool.
B — Furnace cool 50° F/hr to 500° F.
C — Air cool to 450° F, soak 4 hr at 450° F.

† Other types similar to those listed, are enclosed in parenthesis.

temperature of the water, will go into solution. Raising the temperature allows an additional amount of salt to go into solution. Lowering the temperature causes part of the salt already dissolved to be precipitated or thrown out of solution in the form of crystals. Basically, the same thing occurs when certain soluble elements are added to aluminum. The elements are the salt; the aluminum is the water; and the crystals of salt thrown out of solution the precipitate.

Size of the precipitated salt crystals can be increased by controlling the temperature of the solution. In a somewhat similar manner, the size of the precipitate in the heat-treatable alloys is increased to an optimum size during the annealing operation so the metal can be more easily worked. After the material has been formed or fabricated to the desired shape, it is hardened and strengthened by thermal treatments which cause the coarse particles of soluble constituents to go back into solution and be re-precipitated in a finely dispersed state.

Thermal treatment used to put the soluble constituents into solution and to prevent or retard their immediate re-precipitation is known as solution heat treatment. It consists of two steps—putting the soluble elements into solution by raising the temperature and then rapid quenching. Commercial strength of a heat-treatable alloy is not obtained by solution heat treatment alone but by combination with a subsequent precipitation or aging treatment. It is, therefore, only one step in obtaining full strength or hardness.

Solution heat-treatment of an alloy is different from annealing in several ways. The processes of recovery, recrystallization and grain growth are similar in both treatments. However, when annealing, the temperature is such that the precipitate of soluble constituents is coalesced or allowed to grow into coarse particles so that they will have less effect in restricting deformation. When solution heat treating, the soluble constituents are actually dissolved in the aluminum.

Amounts of the soluble elements added to some of the alloys are such that the temperature necessary for solution heat treatment must be near the melting point of the lower melting constituents present. With these alloys, overheating by only a few degrees will cause incipient melting. Once this occurs, the metal must be remelted and reprocessed.

Several of the alloys, particularly those strengthened principally by the constituent Mg_2Si (R353 & R361) can be solution heat treated at temperatures in excess of those recommended without encountering melting. The use of such temperatures, however, increases the degree of warping and promotes the formation of a heavy oxide film. With some of the high zinc-bearing alloys, the susceptibility to stress cracking corrosion is increased by the use of high temperatures.

After solution of the soluble constituents is substantially complete, the material must be rapidly quenched to prevent their immediate re-precipitation. If excessive re-precipitation occurs during the solution heat-treatment operation, the size and distribution of the particles are such that little strengthening is accomplished. In addition, the precipitate is formed along the grain boundaries and certain slip planes causing a serious decrease in the resistance to corrosion of many of the alloys.

Hardening of an aluminum alloy by heat treatment consists of four distinct steps:

Heating to a predetermined temperature;

Soaking at temperature for a specified length of time;

Rapidly quenching to a relatively low temperature;

Aging or precipitation hardening either spontaneously at room temperature or as a result of a low temperature thermal treatment.

The first three steps are known as solution heat treatment, although it has become common practice to use the shorter term heat treatment. Room temperature hardening is known as natural aging while the low temperature hardening operation is called artificial aging, or a precipitation thermal treatment.

Alloys that require a precipitation thermal treatment (artificial aging) to develop their full strength also age a limited amount at room temperature, the rate and extent of strengthening depending upon the alloy. Some reach their maximum natural or room temperature aging strength in a few days, at which time they are referred to as being in the "W" temper. Others continue to age appreciably over a long period of time so they are not furnished in the "W" condition. The natural aging alloys cannot be furnished in the "W" temper because they develop their final strength by room temperature aging. Thus, there is considerable difference in the mechanical and physical properties of freshly quenched (FQ) material and material that is in the "W" temper. The fact that material in the "W" temper is already in a partially aged condition should always be kept in mind.

Practices: Temperatures used for solution heat treating depend upon the alloy, ranging from 825 to 980° F. As a rule, they must be controlled within a very narrow range (± 10° F) to obtain best results.

If an insufficient temperature is used, the maximum strengths will not be obtained. When excessive temperatures are used there is danger of melting the lower melting constituents in some alloys. Even

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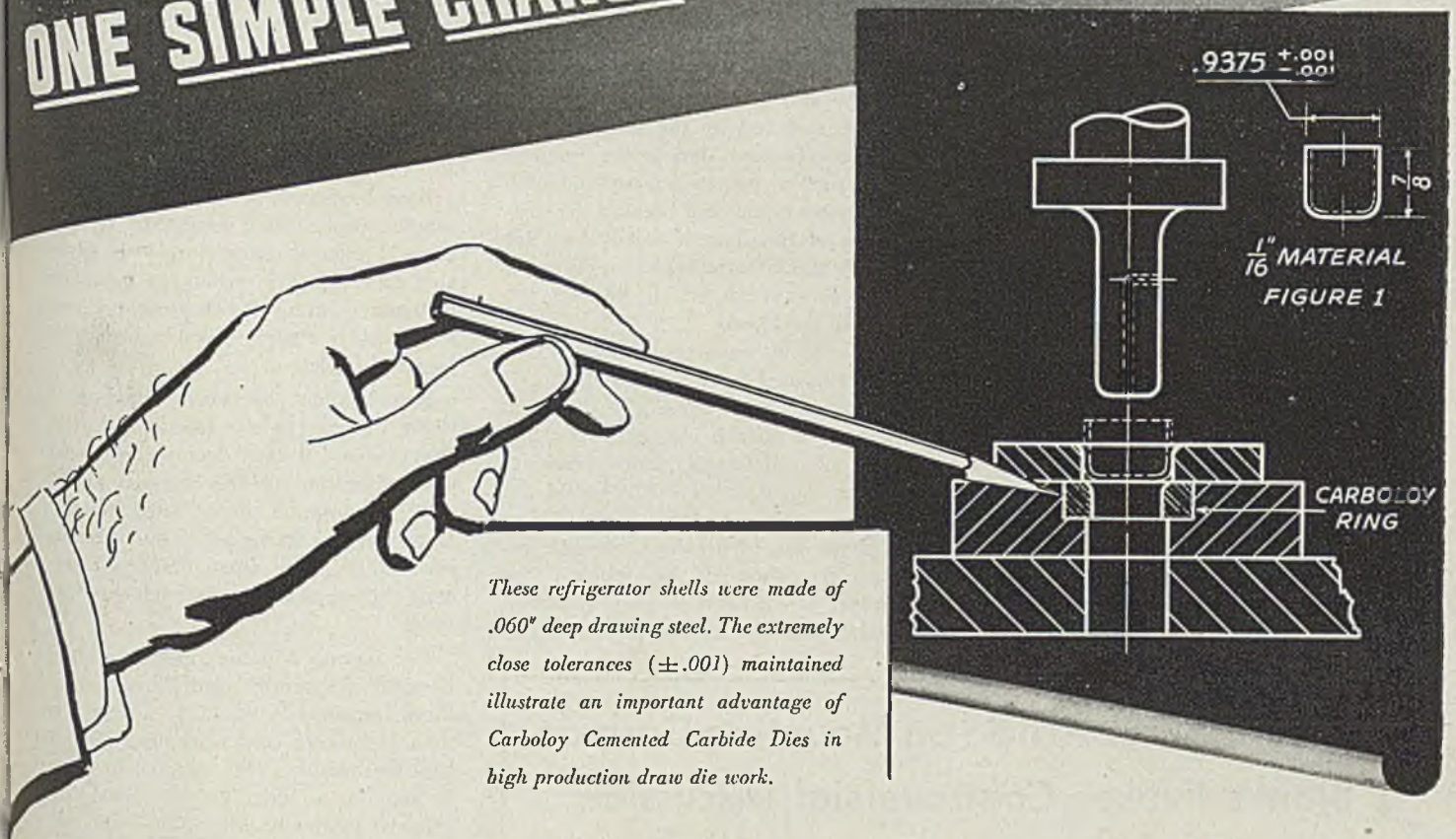

These refrigerator shells were made of .060" deep drawing steel. The extremely close tolerances (±.001) maintained illustrate an important advantage of Carboloy Cemented Carbide Dies in high production draw die work.

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if melting does not occur, the use of higher than recommended temperatures promotes discoloration and increases quenching strains.

Time at temperature, referred to as soaking time, is measured from the time the coldest metal reaches the minimum limit of the desired temperature range. The soaking period varies, depending upon the alloy and thickness, from 10 min for thin sheet to approximately 12 hours for heavy forgings. For the heavy sections, the nominal soaking time is approximately 1 hour for each inch of cross-sectional thickness.

Soaking time is so chosen as to put substantially all of the soluble elements into solid solution. The effect of an insufficient soaking period is obvious. An excessive soaking period aggravates high temperature oxidation if conditions conducive to its inception are prevalent. With cladded material, prolonged heating results in excessive diffusion of copper and other soluble constituents into the protected cladding and may defeat the purpose for which it was intended.

If cold work is present in the material, the heating rate should be reasonably fast to prevent the formation of coarse grains. Generally no grain size difficulty will be encountered unless a critical amount of cold work is present.

After the soluble constituents are in solid solution, the material is quenched to prevent or retard immediate re-precipitation. Three distinct methods are employed depending upon the commodity, alloy and properties desired.

Parts and articles produced from sheet, extrusions, tubing, small forgings and similar type material are generally quenched in a cold water bath. The temperature of the water, before quenching, should not be in excess of 85° F, with the volume of water being sufficient to keep the temperature rise under 20° F. The use of such a drastic quench insures maximum resistance to corrosion, particularly with such alloys as 17S and 24S, even though a less drastic quench may produce the required mechanical properties.

Large forgings and heavy sections can be quenched in hot (150-180°), or boiling water. This type of quench minimizes distortion and alleviates cracking, which may be produced by the unequal temperatures obtained during the quench. Use of such a quench is permitted with these classes of material because the temperature of the quench water does not critically affect the resistance to corrosion of the alloys from which forgings are generally produced.

High velocity water sprays can be used on parts formed from cladded sheet and for large sections of practically all alloys. This type of quench also minimizes distortion and alleviates quench cracking. However, many specifications forbid the use of spray quenching for bare 17S and 24S sheet due to its affect on their resistance to corrosion. Nevertheless, the resistance to corrosion of spray quenched Pureclad 24S is superior to cold-water-bath-quenched unprotected 24S because of the electrolytic (galvanic) protection furnished by the cladding.

Time internal between the removal of the material from the furnace and quenching is critical for some alloys and should be held to a minimum. When solution heat-treating 17S and 24S sheet material, the elapsed time must not exceed 10 sec. Allowable time interval for heavy sections may be slightly greater.

Allowing the metal to cool slightly before quenching promotes re-precipitation from the solid solution. The precipitate is along grain boundaries and certain slip planes causing poorer formability and, in the case of 17S and 24S, adversely affecting their resistance to intergranular corrosion. The strengths and hardness of most alloys are not seriously affected unless precipitation is severe.

Bare heat-treatable alloys can be resolution heat treated repeatedly without harmful effects. However, it is advisable to use either sodium or potassium fluoborate during the heating cycle as a protection against possible high temperature oxidation.

Straightening operations produce a slight increase in the tensile and yield strengths and a slight decrease in the per cent elongation of the material in the "W" or solution heat-treated temper. However, the strengths of the naturally aged alloys, after aging ("T"), are generally higher than for unstraightened material.

For certain forming operations sheet material of naturally aged alloys is sometimes furnished in the "UT" temper (less than 1 per cent cold work after solution heat treatment). This material is slightly superior in ductility to normal "T" material (normally with 1 per cent cold work) because the flattering operations used in its manufacture have been held to a minimum. The material is not perfectly flat but the more pronounced irregularities have been removed. Its primary use is for stretcher-forming operations.

Difficulties which may be encountered when solution heat treating aluminum alloys are:

Low Tensile and Yield Strength: Causes are (a) inadequate "soak" or insufficient temperature; (b) slow transfer from furnace to quench tank; (c) slow quench; (d) overheating; (e) high temperature oxidation.

Excessive Diffusion in Cladded Material: Causes include (a) prolonged heating during solution heat treatment or during a previous high temperature annealing operation. (b) Excessive number of reheat treatments. In the lighter thickness, some diffusion to the surface (peak diffusion) is unavoidable with the

Recent STEEL Article on Mounting Carbide Blanks Evokes Controversial Discussion

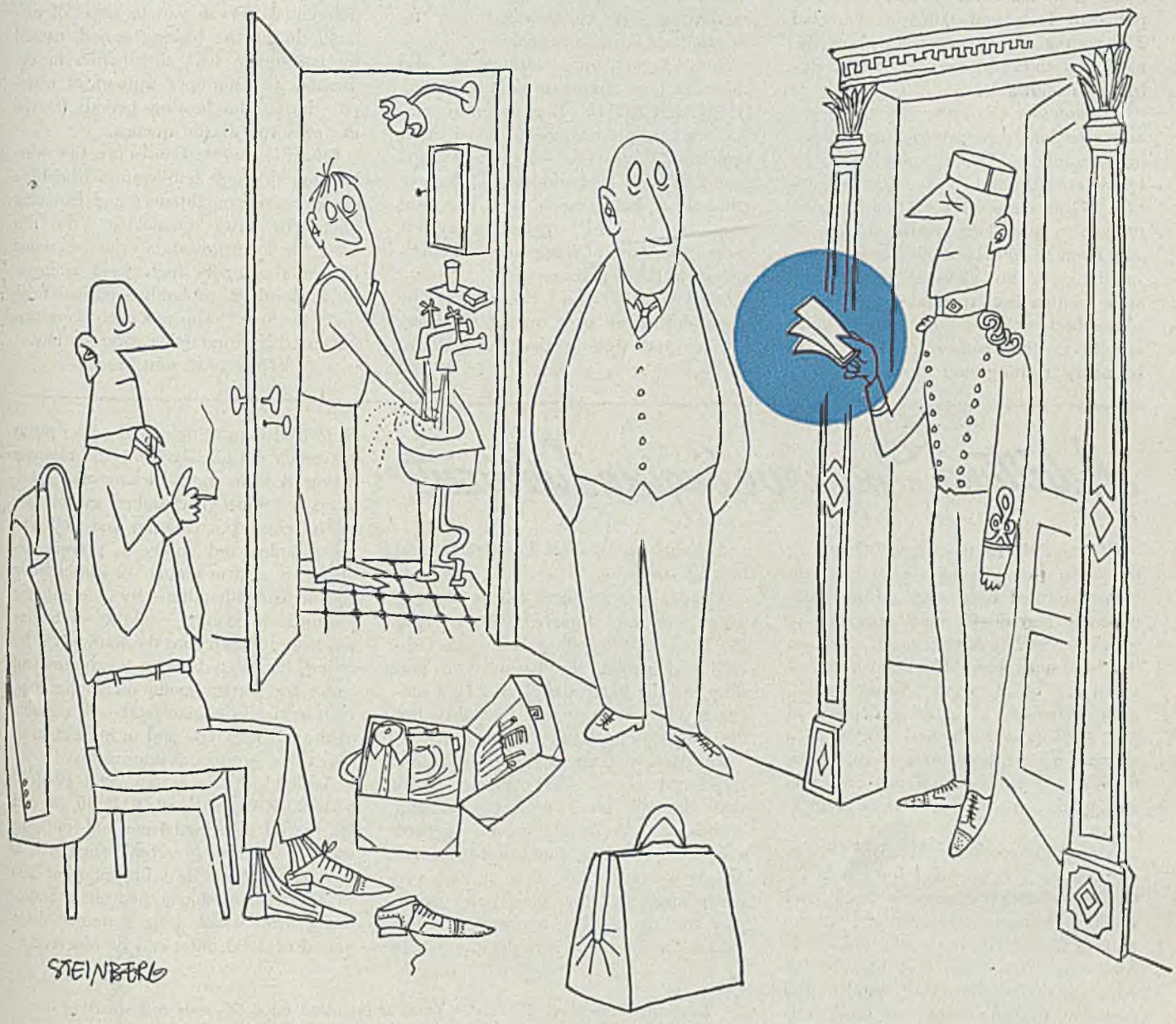
COMMENTING on Fred W. Lucht's article on "Cutter Life as Affected by the Mounting of Cemented Carbide Blanks," STEEL, July 22, page 80, Mr. A. O. Schmidt, research engineer in charge of metal cutting research at Kearney & Trecker Corp., Milwaukee, makes the following observation:

"Mr. Lucht's investigation is an interesting contribution which contains many valuable points. However, with regard to the type of tools used in these tests the comparison between the brazed tip and mechanically-held carbide tip is limited to a particular design of single point tool which can be used as a lathe tool and also in a milling cutter body. This comparison initially places mechanically held tips in general at a disadvantage since the particular type of arrangement used is really not as rigid as it should be to take the shock of interrupted cutting as it occurs in face milling and therefore is not representative of the performance of mechanically held tips.

"We agree with the author that properly dimensioned brazed tips are very efficient and strong and we also use them. However, we have found that a solid carbide blade mounted properly in a milling cutter body will stand up at least equally well and in long run will be more economical.

"Had the holder for the mechanically-held carbide tips used in these tests been designed for milling, the graph in Fig. 7 and the conclusions would have been somewhat different. The chief merit of Mr. Lucht's experiments is the fact established again, that a tool has to be rigid in all its components in order to be fully effective."

NO.5 THE PUZZLE OF THE VANISHING DOLLAR?



Get this! Three gents put up at a hotel, paying $30 rent in advance. Shortly afterward the clerk discovers that he has overcharged them $5, so he sends that amount back by the bellhop. But the bellhop, a weak character, returns only $3. Now the men have paid $27 and the bellhop has $2 — making a total of $29. *What became of the extra dollar?*

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Springfield, Vermont, U.S.A.

Manufacturer of: Universal Turret Lathes • Fay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies.

practices necessary to developed the desired mechanical properties and is allowed within reasonable limits. Normally 0.032-in. Pureclad 24S with a 5 per cent liner and 0.064-in. Pureclad 24S with a 2½ per cent liner are the maximum thickness in which peak diffusion is allowable.

Intergranular Corrosion: Usually found only after long exposure to a saline-bearing atmosphere. It drastically lowers the tensile strength and the per cent elongation. Causes are (a) slow transfer from furnace to quenching media; (b) use of mild quench; (c) uncontrolled or improper reheating to an elevated temperature after solution heat treatment.

Overheating: Also known as melting, eutectic melting, incipient melting, grain boundary melting and rosetteing. Results in loss of ductility and in severe cases, produces blisters and reduces strengths. It also promotes cracking during quenching. A slight amount of overheating can be detected only by metallographic examination.

High Temperature Oxidation: Also known as high temperature deterioration, H.T.O. and H.T.D. It is generally confined to bare products heat treated in air furnaces. Causes are (a) prolonged exposure at high temperatures; (b) furnace atmosphere, being much more prevalent in oil and gas-fired furnaces. The presence of moisture and sulphur compounds aggravate the condition.

Quenching Cracks: These generally occur during or after quenching heavy sections and sections that have abrupt changes in cross section. They do not occur in sheet material. Cause is usually the use of a too drastic quench.

Excessive Distortion and Warpage: Results from (a) an excessive temperature differential betwen various areas of material during the heating period, caused by inadequate heat distribution in the furnace; (b) improper support of material during the heating period; (c) the use of a too drastic quench.

Low Elongation: Causes are (a) overheating; (b) high temperature oxidation; (c) excessive straightening and flattening operations after quenching. In this case, the low elongation is accompanied by an abnormally high yield strength. (d) In forgings, probably improper forging technique. The per cent elongation possessed by forgings is naturally low.

(*Continued next week*)

Additives Improve Engine Lubricant

CLEANING of the engine is one of the major functions of a new lubricant with a refined base stock treated with patented ingredients, small amounts of which are said to have a major effect on the lubricant's properties. Incorporated additives, of a nonpetroleum origin, make it capable of carrying deposits of soot, carbon, varnish and sludge in a suspended state, preventing them settling to the bottom of the oil pan and permitting their removal when lubricant is changed.

Named Permalube by Standard Oil Co. of Indiana, it is intended for use in internal combustion engines in trucks and tractors, industrial locomotives, cranes and stationary power. According to American Petroleum Institute, which adopted the designations regular and premium for lubricants, this product is said to meet the qualifications of premium grades—protection against varnish and sludge deposits, oil deterioration and bearing corrosion.

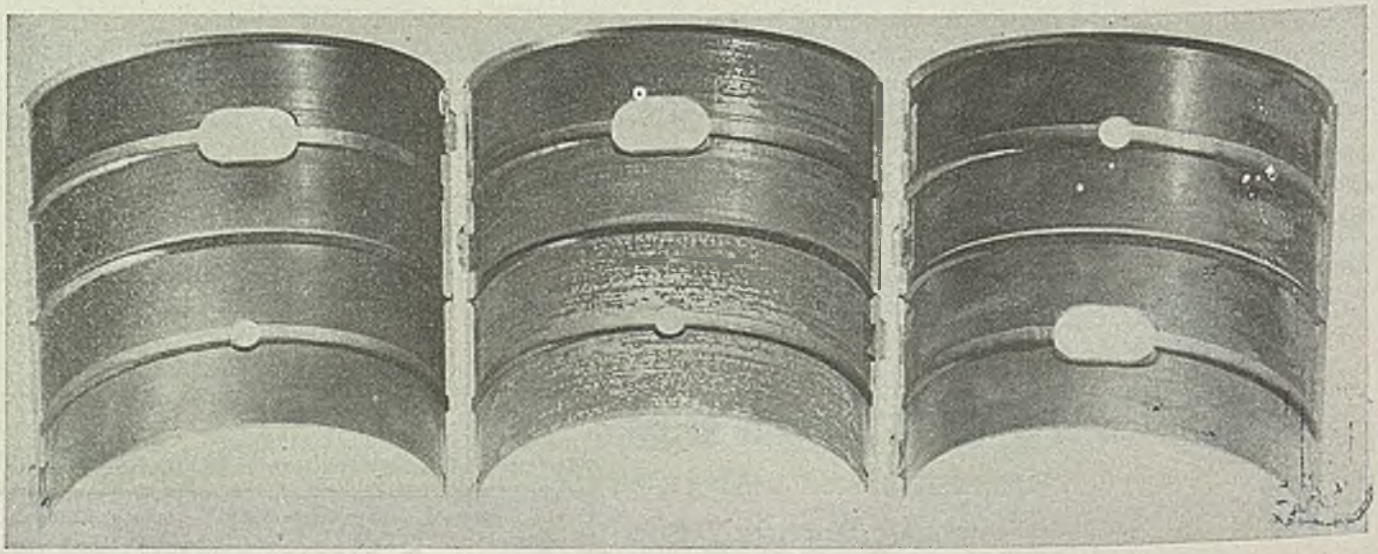
According to Standard Oil its cleaning action may be compared with washing the hands. When dirty hands are lathered and rinsed, the basin water gets dirty but the hands get clean. In a similar manner the new oil gets dirty but the engine gets clean.

Besides living up to the qualifications mentioned above, the company states that the oil gives protection against scratching, scoring and seizure of parts —important during the break-in period of a new engine, and that its high viscosity index and low pour point assure easy starting and low temperature lubrication—an important consideration where motorized shop vehicles and power plants see much outside service. The cleaning action reduces ring sticking and minimizes combustion chamber carbon.

The close fractionation and high viscosity index and ability to prevent deposits are said to reduce oil consumption and increase filter life. By incorporating an antifoam agent, possibility of engine action beating air into the lubricant is reduced, it is stated. This is an important factor for certain motor oil applications, such as use in engine intake air cleaners of the oil bath type and in lubrication of over-drive equipped transmissions.

Available in six grades, SAE 10-10W, SAE 20-20W, SAE 30, SAE 40, 50 and 60, the oil is refined from mid-continent crude. On new or rebuilt engines it is best to change this lubricant after 200 to 500 miles to remove the usual contaminants, after which time a normal drain period of 1000 miles can be observed.

Bearings from three Chevrolet engines operated on a 36-hour test. Bearing at left is from engine lubricated with Permalube motor oil. Center bearing is from engine lubricated with another premium motor oil and bearing at right is from engine lubricated with a regular motor oil



ARC-WELDING *Cast Iron*

Nickel electrode reduces need for special treatment of casting before and after welding

BECAUSE cast iron is brittle and heat-sensitive it has sometimes been a problem child for maintenance men who seek to repair broken castings by metal-arc welding.

Welding has meant a series of compromises in the properties of the finished weld. Some weld deposits are easy to machine but low in strength and subject to cracks and porosity. Others are strong, but hard to machine. Particularly in stressed castings, deposits tend to spall out or to flake off in service because of poor fusion with the parent metal. Sometimes there is also evidence of excessive cracking at, or just outside the fusion line.

Advance in repair, maintenance and construction of cast iron is the development of a suitable welding electrode called Ni-Rod, by International Nickel Co.'s research laboratory located at Bayonne, N. J.

Nickel rod is said to have a stable arc in all positions with deposit washing up evenly against sides of the joint. Special steps in preparation of the casting and treatment after welding are not necessary except when a very high degree of machinability is desired, or when structure and shape of the casting are likely to develop high internal stresses during heating and cooling cycles caused by the arc.

First and largest field of cast iron welding is general maintenance of cast iron parts and equipment such as is shown in Fig. 1. This includes welding cracked and broken castings and building up worn surfaces. Machinability may be another necessary quality as in the case of casting which has cracked or broken in one of its operating surfaces or across threaded bolt holes.

Sometimes even in good foundry practice a blow hole or some mishap in pouring may spoil an otherwise perfect casting. Repair of these minor flaws in new castings is second biggest welding field. When the spot has been weld-filled or built up as in Fig. 2, and finished by machining or grinding, close color match between the nickel rod's deposit and cast iron is said to make it almost impossible to see where the casting has been welded.

As a production tool, the nickel welding rod is reported to have been used efficiently to weld steel bars to castings with the elimination of such steps as chipping casting face, drilling and tapping. Machining errors on castings can also be erased.

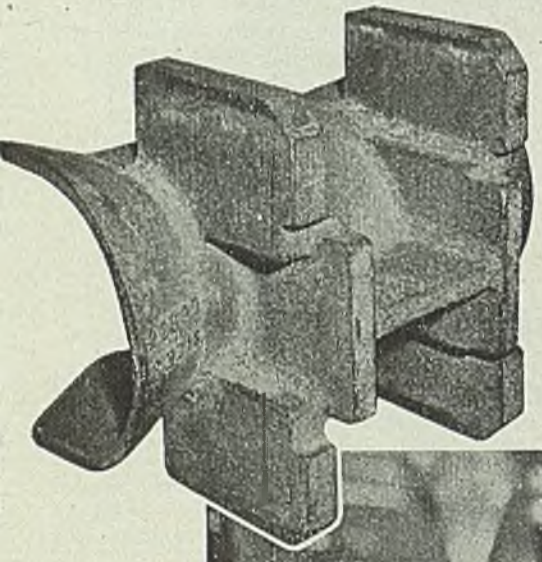
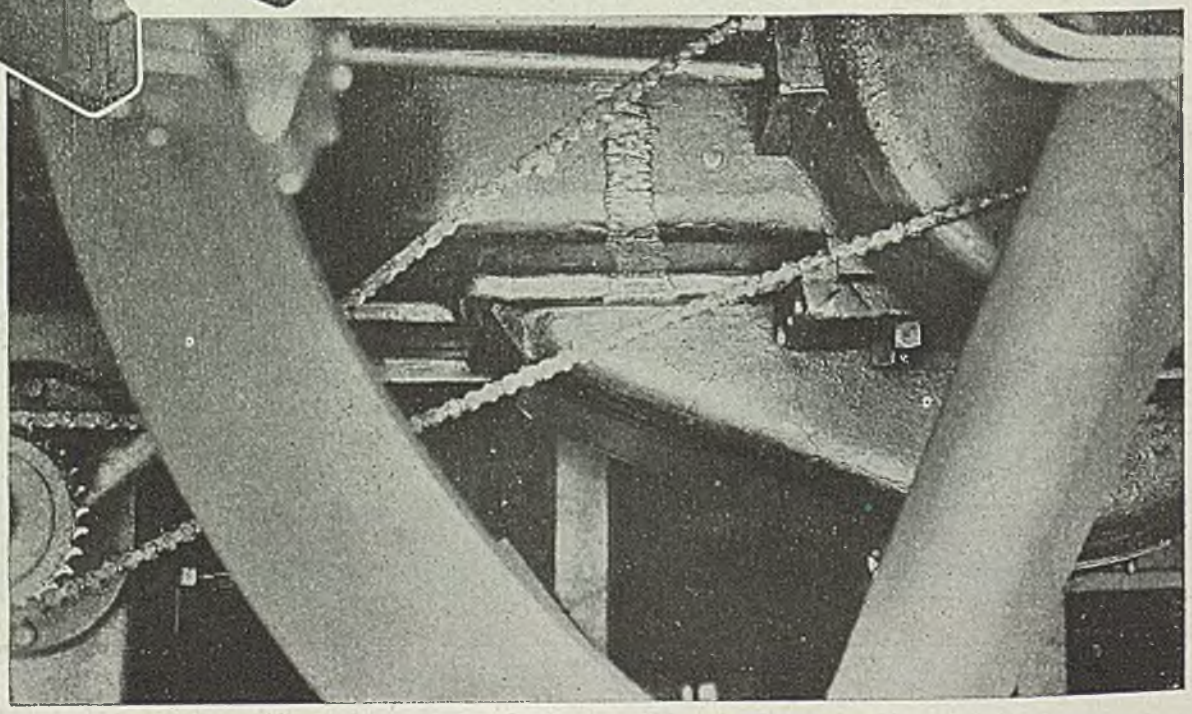


Fig. 1 (below)—Two cracks, one 14 in. and the other 3½-ft long in base of this air compressor were skip welded with nickel electrode. First pass was made with ⅛-in. and subsequent passes with 5/32-in. rods until vee was slightly above flush. Welding time: two days

Fig. 2 (left)—By mistake in pattern of guide barrel used in tube mill, this casting was made ¼-in. minus on each guide. Guides were built up by ten passes of 5/32-in. electrodes, equalling three layers. No preheat was required



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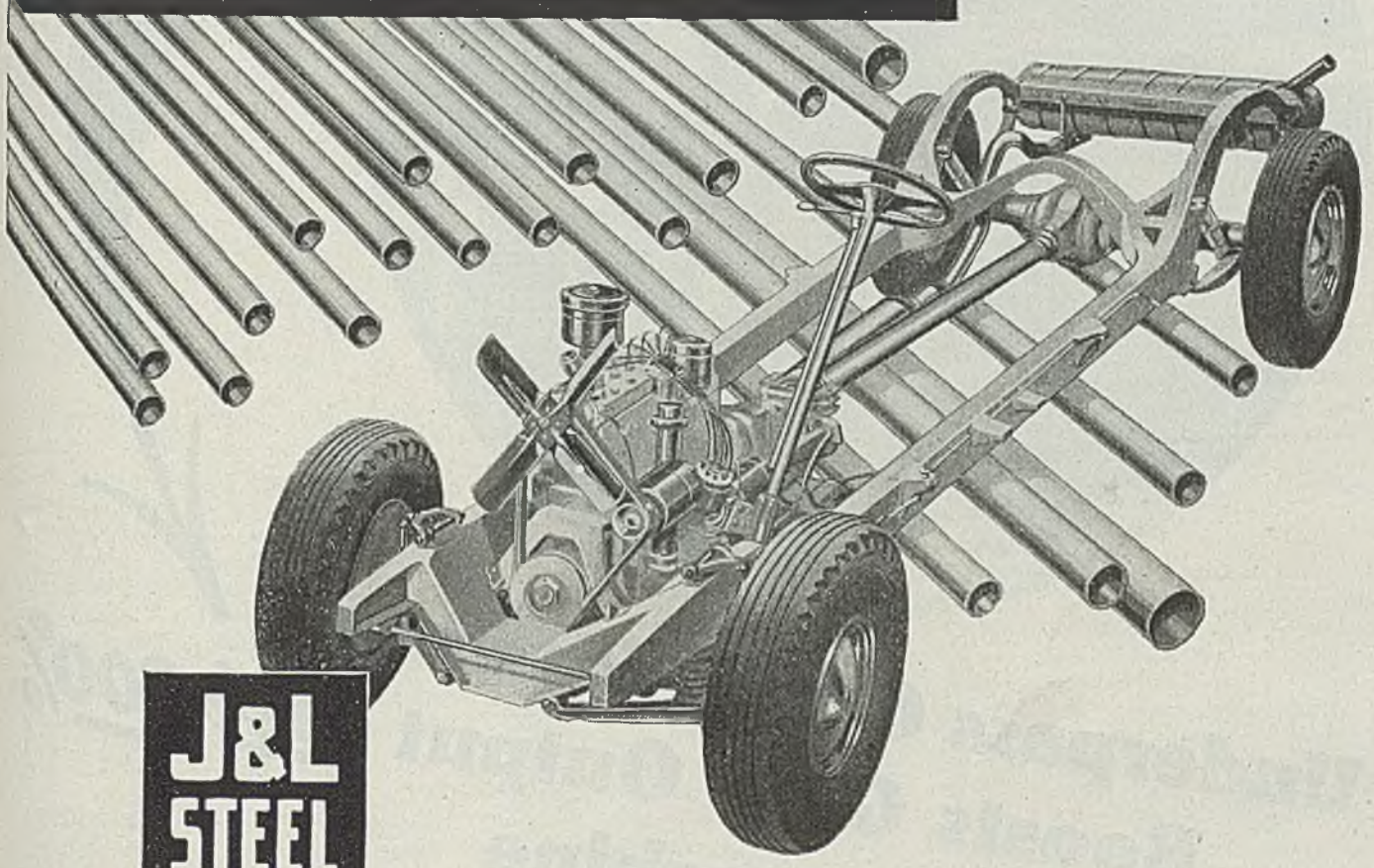

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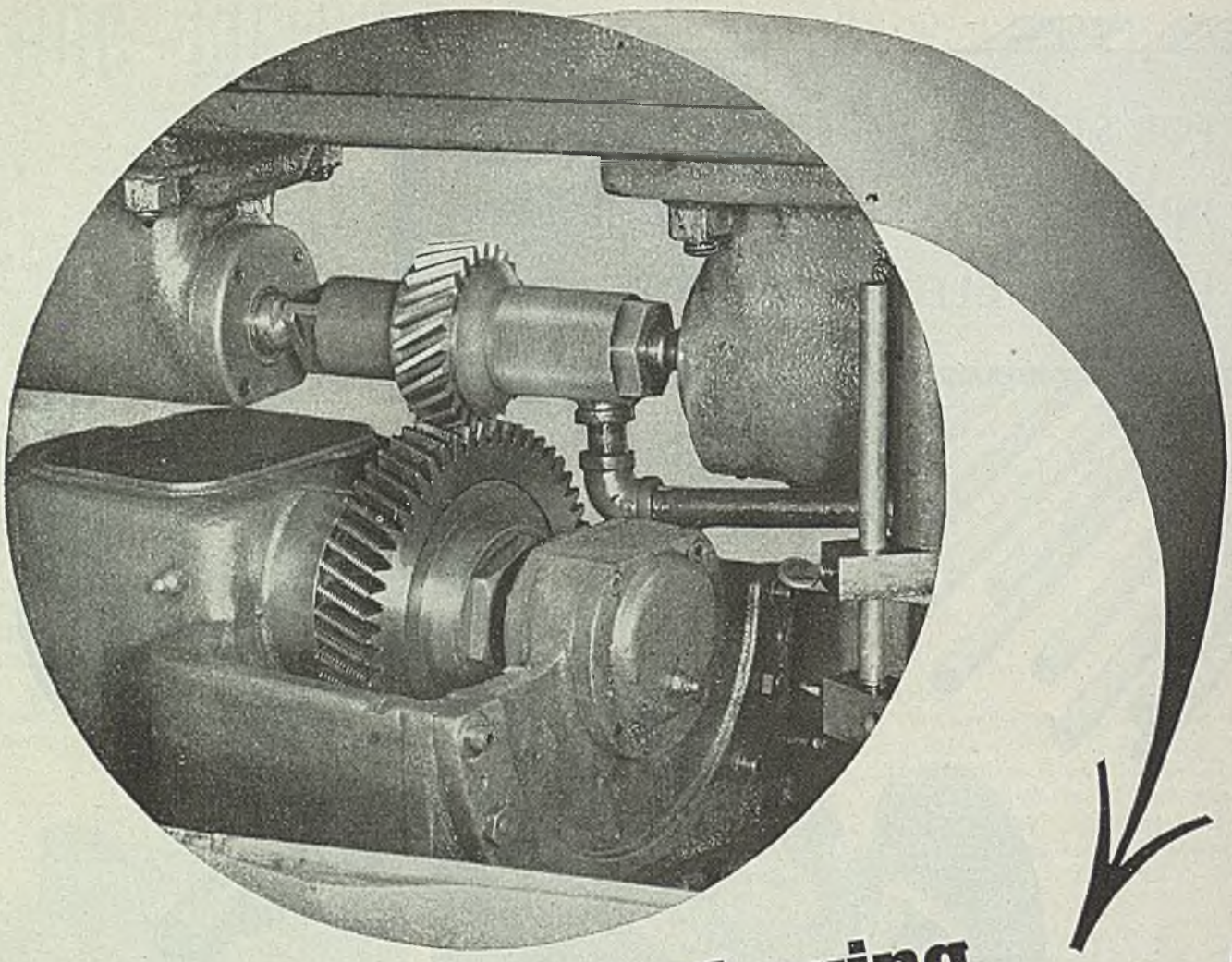

Underpass Curve-Shaving Boosts Gear Output *Over 200%* per machine

A large gear producer was getting 36 eight-pitch 24-tooth cast iron timing gears per hour on his gear finishing machines, removing .004 to .006 inches of stock, measured across pins.

When he installed a MICHIGAN underpass gear finisher in the line, however, output on the one underpass machine was more than total output on three of the other type—110 gears per hour.

Of interest is the fact that the underpass shaving cutter *curve-shaved* the gears at the same time that it finished them to within .0002 in. of spacing error and within .001 inch for eccentricity.

Curve-shaving—which crowns the faces of gear teeth—is built right into the underpass cutter, eliminating cam mechanisms, rocking motions, etc.

For complete information on MICHIGAN underpass gear finishing machines, ask for Bulletin #860A-44

ORIGINATORS of GEAR-SHAVING

MICHIGAN TOOL COMPANY

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ENGINEERING NEWS at a glance

AVERAGE American home contains from six to a dozen fractional horsepower motors, the Civilian Production Administration estimates. Shortage of these small motor components for warm air furnaces results from their diversion to other home uses such as refrigerators, fans, vacuum cleaners, sewing machines, electric clocks, kitchen mixers, ironing machines and phonographs.

ALL advantages of projection inspection are assured users of the engineering service currently offered by Engineers Specialties Division, Buffalo, which includes production of staging fixtures and co-ordinated chart fixtures. Supplied with blueprints, operation data, sample parts and other necessary information, the company today is prepared to develop and produce suitable components for optical projection comparators. As result of the service, one company now gages 18 dimensions of a pinion and integral shaft in 15 sec by optical projection, using a staging fixture and chart gage developed through the service.

MANUFACTURING problem that probably never occurs to most people is the job of putting connection or set screws into such parts as doornobs, light switches, golf clubs and a thousand other devices. To make the job easier—and more economical— Detroit Power Screwdriver Co., Detroit, is currently making machines that not only drive screws, but also feed the screws automatically, one at a time, to the screw driver. The operator need only position the object to be fastened.

INDUSTRIAL materials so transparent that little or no detail can be seen in them are no longer a problem with the development of what American Optical Co., Southbridge, Mass., calls phase microscopy. Incorporation of light-controlling diffraction plates in an ordinary light miscroscope provides the instrument with a range of human vision far beyond the limits of present microscopes. Placed in an objective lens system, the plate makes detail visible within a specimen by increasing, reducing or reversing contract in the image formed by the microscope.

AT the plant of Ohio Pipe Bending & Machine Co., Cleveland, an electric railroad car spotter is providing efficient performance despite the absence of a railroad siding. Here instead of pulling cars, a Link-Belt spotter provides the pulling power for bending large pipe up to 8 in. in diameter—power formerly applied manually. After each pipe is filled with sand and heated, it is placed on the bending bed in which removable pins are set at predetermined positions, according to the degree of bend desired. A pulley block is connected to the pipe and the rope is looped on the capstan of the car spotter. To increase or decrease speed of the bending process, the operator merely tightens or eases his pull on the rope looped around the revolving capstan.

DELIVERY of a 250-ton mechanical sheet perforating press was made recently by United Engineering & Foundry Co., Pittsburgh, to Wickwire Spencer Steel Division of Colorado Fuel & Iron Co. at Clinton, Mass., it was learned in the steel city. Press is arranged to punch out a wide variety of perforations 1/8-in. to 1½-in. in diameter in sheets up to 44 in. wide; also special shape and grill work punching, the number of holes of a given size being proportional to the thickness and physical characteristics of the material to be perforated. Material is fed into and out of the press by pinch rolls located on the entry and delivery sides actuated by an inching clutch and variable stroke crank to give a variable feeding stroke of 0 to 3 in.

FORMATION of a new department for the manufacture of carbide dies is reported by Lincoln Park Industries Inc., Lincoln Park, Mich. The company, which produces cemented-carbide gages, precision tools and special fixtures, supplemented its existing facilities with $75,000 worth of new equipment, particularly adaptable to die work. Production of dies already is under way.

METAL parts sometimes corrode badly under protective coatings unless water is displaced and fingerprints are removed. One solution to the problem is the use of Tectyl 472, developed recently by Freedom-Valvoline Oil Co. of Freedom, Pa. The product, by slushing or spraying it on ferrous or nonferrous metals, is reported not only to render perspiration and fingerprint residues inactive, but also effectively to remove contaminants. It protects metals stored indoors as long as two months, and can be removed easily by a petroleum solvent or alkali cleaner.

FROM New York, Permutit Co. reports development of a process which recovers scarce and valuable metals now being lost in waste waters. Process also is said to be beneficial in reducing stream and harbor pollution in the vicinity of electroplating and other metalworking plants.

RADIATIONS from radium, uranium and other similar materials are evaluated, or the ores themselves located by means of an apparatus developed recently by Geophysical Instrument Co. at Arlington, Va. Small enough to be carried in an overcoat pocket, the portable instrument is said to be rugged enough for field service, yet very dependable for lab use. It employes the Geiger-Muller counter tube, and is powered by batteries enclosed in its metal housing.

FIRST commercial application of General Electric's turbo-superchargers will be on 50 Boeing stratocruisers to be built for world airline operations, it was learned in Schenectady, N. Y. Boeing Aircraft Co. recently placed an order for 200 turbosuperchargers for the planes, first production model of which is scheduled for early 1947. Smaller and lighter in weight than installations used in B-29 bombers, the turbo-units are designed to supercharge the engines during flight but not during takeoff. They also are expected to save up to 14 per cent in fuel consumption at cruising altitudes.

PROFESSIONAL fish smellers, who can tell at a whiff whether or not fish is spoiled, are about to join the ranks of the unemployed through the development of a Stinkometer, according to the Hooper Foundation of the University of Califor-

nia, Berkeley, Calif. Expressive as it is, the name falls short of denoting the full scope of the instrument. The device measures pleasant odors as well as offensive ones, and its inventors see a future for it in a broad range of manufacturing and processing industries.

NEW alloy with wide possibilities as a molding material for casting of plastics, rubber and other materials was announced recently in New York by Trethaway Associates. Dubbed Moldaloy by the organization, the product is recommended for forming dies for thin sheet metals, proof casting of forging dies, molding chuck jaws for holding irregular shaped pieces and other applications. Product melts at 430°F, has a hardness of 22 brinell, compression of 8000 psi, tensile strength of 11,500 psi and shrinkage of about 0.001-in. per inch.

ABILITY to adapt itself to the contour of irregular surface of the work piece by means of its shredded abrasive tip which are pressed down by brushes into every groove and depression to produce a smooth finish is the chief feature of a brush-backed sander and abrasive head now produced by Vonnegut Moulder Corp., Indianapolis. Its construction permits rapid dissipation of frictional heat. While abrasive action is practically continuous, the air spaces between the brushes and the bristles themselves, permit heat to be carried away quickly without producing discoloration or other defects on metal surfaces. In addition, the head does not wear down to a smaller and smaller diameter,, thus reducing peripheral speed. Instead, it maintains a constant diameter. As abrasive tips lose their cutting efficiency, the head is simply unlocked, its inner sleeve given a slight turn, and new cutting surfaces are released.

TO obtain both rigidity and corrosion resistance, a special chlorination furnace for Vanadium Corp. of America, Bridgeville, Pa., was fabricated of 20 per cent Lukens nickel-clad steel by Struthers Wells Corp. Installed as a pilot plant unit in the research and development departmnet of the company, the furnace—25 ft high by 2 ft OD—handles chlorine and sulphur chlorides at working temperatures to 800° F. Nickel-clad steel was used on the top and bottom cover plates as well as for the 12 side cover plates, flanges and frames of the bolted handholes. Remainder of the shell is of solid nickel.

TWO patents registered at the Patent Office and now available for licensing or sale are said to provide a machine for making and reconditioning saw teeth. The combined units, method and machine for generating saw teeth, patent No. 2,329,879 and mechanical movement, patent No. 2,339,978 produce automatically and maintain accurately-spaced teeth of uniform shape and size. Unit is easily adjusted for all shapes and sizes ranging from hacksaw to cross-cut beveled type teeth. Selection of any required pitch and number of teeth per inch is achieved by movement of a lever and selection of a gear on a spacing gear. With appropriate attachment it may be adapted to circular saws. According to co-owner D. F. Christy of Hinsdale, Ill., tests indicate life of power hacksaw blades can be increased from 300 to 500 per cent and their cutting speed increased by at least 40 per cent with the use of the patented development.

HYDRAULIC functions of variable-pitch aircraft propellers are tested on this combination propeller hub and regulator test rig designed recently by Hydraulic Machinery Inc., Dearborn, Mich. In testing, the propeller hub is mounted on a semisteel surface plate which includes scribed markings for checking blade angle at stations indicated by manufacturer. Surface plate is positioned so blades can be rotated while under pressure for the full 360 degrees to check propeller track

LOGS up to 60 in. in diameter and of any length can be peeled at the rate of half-million board feet per day by using a device that employs water pressure to strip bark from trees. Recently developed by Worthington Pump & Machinery Corp. of Harrison, N. J., in collaboration with Soundview Pulp Co., Everett, Wash., the "barker" consists of a ring formed by three 120-degree segments—these fitted with 36 nozzles. Log to be barked is conveyed through the center of this ring. The nozzles, in turn, release water which pounds away at the bark, exerting pressures of 1200 to 1400 psi and velocities of over 400 fps.

GALVANIZED steel storage tanks and other chemical equipment will be rendered more useful, it is said, by a new process which makes it possible to regalvanize welded seams and joints in galvanized sheet, plate and pipe. Process, announced by Galv-Weld Products, Dayton, O., makes available to postwar designers the advantages of all welded galvanized steel construction by providing 100 per cent protection against corrosion at the point of weld. Painting is thus unnecessary since the mill galvanized coating, together with the protection of the welds by Galv-Weld alloy offers greatest possible resistance to corrosion.

SEALS in electronic tubes are made under controlled conditions without variations in oxidation by using a new method of applying Kovar seals developed by engineers at the Westinghouse lamp division. In the method devised at Pittsburgh, the Kovar surface is correctly oxidized by first heating in an oven, temperature of which is controlled closely. Then powdered glass suspended in a suitable liquid is applied to the cooled oxidized Kovar by ordinary spraying or dipping methods. The piece is again heated to fuse the glass. Result is the Kovar is coated with a film of glass to which glass can be sealed in the ordinary manner. Method is said to be especially suitable for making large complex seals.

"Reduced cleaning time approximately 50%."

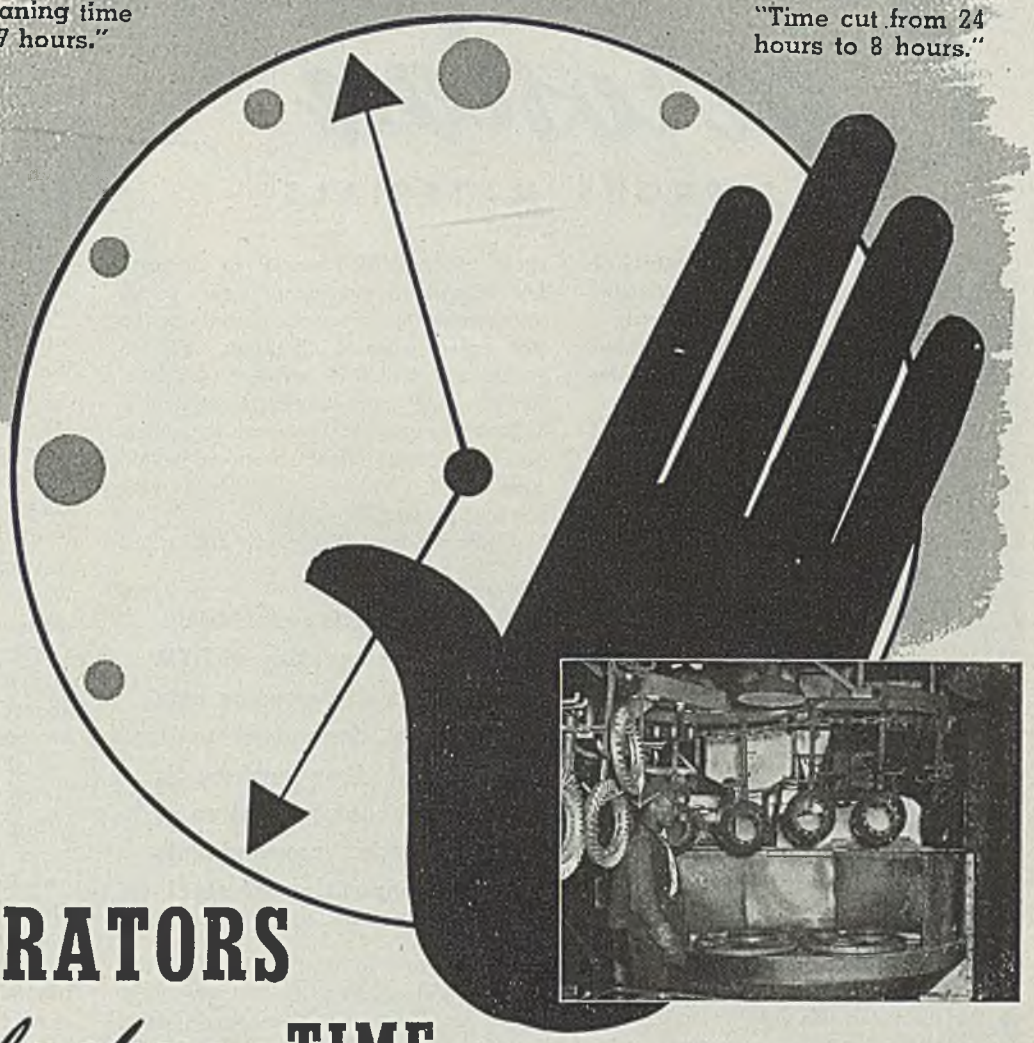
"32 hours' cleaning time reduced to 7 hours."

"Time cut from 24 hours to 8 hours."

"5 hours' former cleaning time reduced to 15 minutes."

"We are cleaning castings in half the former time."

"60 man-hours of cleaning time reduced to 7 man-hours."



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put a brake on TIME

Every production operation represents a closely calculated measure of time. In metal cleaning, the time factor is usually responsible for high costs. As time is cut, costs are cut also.

The Airless Wheelabrator throws 300 lbs. of abrasive per minute in a controlled stream that completely scours heavy loads brilliantly clean in a few minutes. Compressed air, with its costly power and equipment requirements, is entirely eliminated. Cleaning time is drastically reduced, as shown by the statements of users above.

There are many other advantages of the Airless Wheelabrator method of cleaning. As all scale and sand are removed down to the virgin metal, machining and grinding are faster . . . tools last longer . . . inspection is simplified . . . hardness readings are accurate. Wheelabrated products are bright, silvery and uniformly clean. A Wheelabrated surface provides a perfect bond for final finishing. Chipped and rounded corners are eliminated.

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Pittsburgh

Corrosion OF FERROUS MATERIALS

ATMOSPHERIC corrosion rates of identical specimens of iron vary tremendously throughout the world. Variables which are most responsible for these great differences are length of time the surface is moist and the amount and nature of atmospheric contaminants, of which sulphur dioxide and sodium chloride are the most common and potent. Under similar conditions of exposure at one location, the atmospheric corrosion rates depend mainly upon composition of the steel and not upon method of manufacture.

"Atmospheric corrosion resistance" is considered to be a direct function of the type of rust that is formed during the first year or so of exposure. Physical nature of this rust depends to a large extent on composition of the steel and conditions under which the rust is formed. There is a direct relationship between roughness of rust and corrosion. After 6 months to 1 year's exposure, an approximate separation of ferrous materials into classes may be made by the roughness of the rust, also by its color; the darker the color, the more protective the oxide. Rust formed in a marine atmosphere is not as protective as that formed at an industrial location, probably because of the effect of chlorides on the rust.

Comparisons of data from tests having a large number of combinations of alloying elements show that effect of each alloying element is not quantitatively the same at marine and industrial locations. Data obtained from steels having a very low residual amount of copper, phosphorous, silicon and nickel show that only a slight increase in percentage of some of these elements is required to decrease loss of weight (increase corrosion resistance) when the given steel contains 0.5 per cent or more of chromium. For example, effect of 0.15 per cent phosphorous in a 1.00 per cent chromium steel is sufficiently great to overcome the otherwise deleterious effect chromium would have had if it had been the only alloying element present.

Under the test conditions, 4 x 6 in. test specimens exposed at an angle of 30 degrees to horizontal and facing south indicate that about 10 to 18 grams of steel seems to be amount required to furnish the metal constituents with a protective rust film. To obtain losses below this amount after 8 years' exposure in industrial atmospheres, it is necessary in most cases to add alloying elements in amounts which cannot be justified economically.

Results of tests reported before annual meeting of ASM indicate that corrosion rate is mainly dependent upon length of time surface is moist, amount and nature of atmospheric contaminants and composition of steel

An examination of data accumulated on commercial products under atmospheric corrosion test shows: (1) There is, on the whole, an appreciable superiority reflected for Cr-Si-Cu-P over the Ni-Cu-Mo-P steels in the industrial atmosphere at Kearny, N. J. Moreover, the Cr-Si-Cu-P steels had lower losses than the Ni-Cu-Mo-P steels in the semi-rural atmosphere at South Bend, Pa. (2) There is no significant difference in corrosion losses between several steels containing nickel and copper, with or without additions of other alloying elements. (3) Where two or more specimens of the same type of product are included, there is an appreciable variation in losses at each removal period. (4) This "variation in losses" explains why alloy steels are sometimes shown in different "order of merit" in tests in which fewer similar steels are included. Probably other factors such as weather and surface conditions of individual specimens also have an appreciable effect. (5) Large variation in the losses of plain steels which are essentially similar illustrates the number of factors affecting the atmospheric corrosion of these materials. (6) The copper content is the controlling factor in corrosion rates of low metalloid open hearth irons and steels.

Addition of small amounts of alloying elements, unfortunately, does not yield increased corrosion resistance, even if the water is relatively pure. Tests conducted by the laboratory indicate that about 2 per cent of chromium is required to obtain a 50 per cent improvement in loss of weight, even when no precipitated chromium carbides are present.

Results of many immersion tests in sea water show that the average penetration (calculated from losses of weights) of most plain and low alloy steels and irons is about 0.004-in. per year. As in fresh water, chromium steels in sea water exhibit less overall corrosion than plain steel, but the tendency to pitting attack is increased unless precautions are taken to prevent precipitation of chromium carbides. Corrosion can be very severe between tide levels and particularly above high tide level where steels are wet periodically or only occasionally by salt water. Steels having only low residual amounts of alloying elements deteriorate very rapidly under these conditions of exposure. While the corrosion rates of copper and low alloy steels are considerably less under the same conditions, the rates may still be too high for a satisfactory service life.

Simplified Practice Recommendations Offered

Copies of simplified practice Recommendations R221-46, steel rivets, and R169-45, bolts and nuts (stock-production sizes), are now in print and available from Superintendent of Documents, Government Printing Office, Washington. The steel rivet bulletin establishes a voluntary simplified list of stock production sizes for small rivets having round, flat, truss or wagon box or countersunk heads. Compiled by Division of Simplified Practice of National Bureau of Standards, this bulletin sells for 5 cents.

The bolt and nut recommendation establishes a simplified list of stock-production sizes for various types of bolts and nuts as well as milled studs. It is a revision of the original 1937 recommendation.

Short Cuts in Fabricating

Pictorial time study of metal fabricating short cuts is shown in the booklet entitled "DoAll Equals Ten Plus," offered by DoAll Co., Minneapolis. Showing technique of contour machining and its application in metal working shops, the booklet gives graphic comparisons of how productivity and life of more costly machine tools can be increased.

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These adjustable collars have an expansion of .002″ per step and a maximum expansion of .024″. The teeth have a three-point bearing, at all times assuring uniform parallelism of the sides. They are hardened and ground and each tooth is ground on the side and face.

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1918

Hot-Dip Galvanizing Practice

By WILLIAM H. SPOWERS JR.
President
Spowers Research Laboratories Inc.
New York

Pyrometry in Hot Galvanizing

AT THE TURN of the century few pyrometers were used on hot galvanizing kettles. Galvanizers attempted to determine the bath temperature by observing the color of the molten spelter, the behavior of the flux, and the appearance of the zinc coating on the finished work. The accuracy of the guess depended largely upon the experience of the individual. Nowadays, few galvanizing kettles operate without an indicating, recording or controlling pyrometer.

The increased use of pyrometers has been brought about by galvanizers themselves, and by the sustained effort of instrument manufacturers to produce better and more accurate instruments that can be relied upon to satisfactorily do the job for which they were built, providing, of course, a reasonable amount of care is exercised in operating and handling them.

Pyrometers are not intended to supplant skilled operators, but to aid them in maintaining the right temperatures required to produce a clean, uniform coating on various classes of work with given types of spelter, and also to prevent overheating.

Temperature is the most important single factor influencing the destruction of galvanizing pots. A pot operating at 850° F usually lasts about four times as long as one operating at 900° F. The operating temperature of the bath, as well as the furnace temperature, should always be kept as low as possible if a reasonably long pot life is to be expected. High temperatures not only shorten the pot life considerably, but also increase dross production, zinc oxidation, and flux evaporation, as well as lowering the quality of the finished coating.

A pyrometer is a safeguard against freeze-ups or overheating during shutdown periods. In many plants the night watchman must also act as fireman which is sometimes the cause for improper temperature regulation resulting in a freeze-up

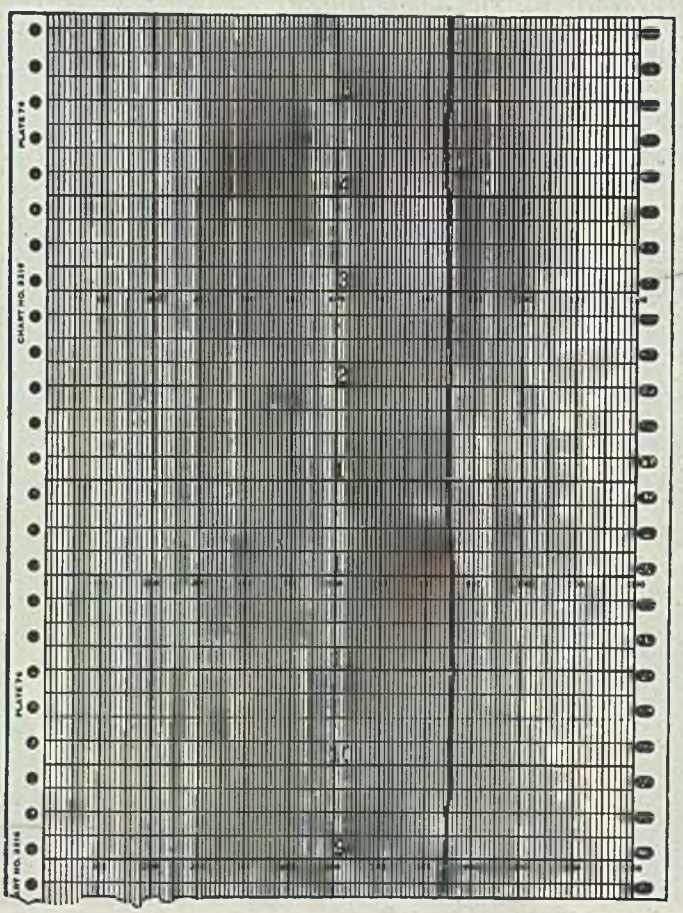
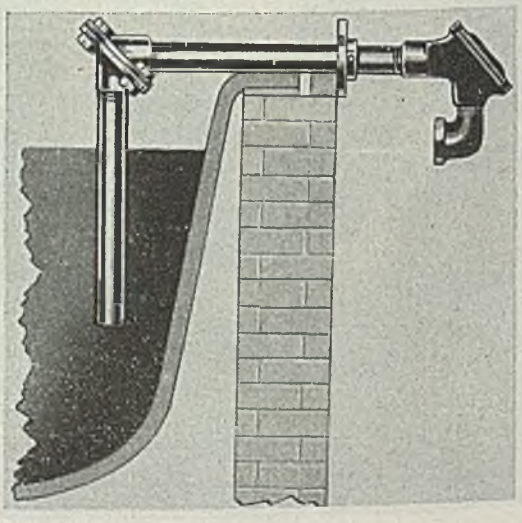


Fig. 17 (left)—Chart from a 3-position controller showing temperature record of a 120-ton galvanizing kettle

Fig. 18 (below)—Angle type thermocouple which is widely used in galvanizing installations for measuring temperature of molten zinc



or overheating. The necessity of employing a man just to fire the kettle at night and on weekends can be avoided by using a controlling pyrometer to automatically hold the metal 10 or 15° F above the freezing temperature.

Multivoltmeter and Potentiometer Pyrometers

The first pyrometers used on galvanizing kettles were expansion pyrometers. This instrument has a long metal rod inside a tube immersed in the bath. A change in temperature causes the rod to expand or contract which, through a mechanical arrangement, moves the pointer on the dial. The accuracy of instruments of this type is decidely unsuitable for galvanizing.

Most of the pyrometers in use today operate on the thermo-electric principle by means of a thermocouple connected by an electrical instrument which converts the electromotive force (emf) or voltage generated by the thermocouple into corresponding temperature readings. The instrument may be of the millivoltmeter or potentiometer type. More detailed information on the principle of the thermo-electric pyrometer may be found in handbooks[a] or brochures of various instrument producers.

The millivoltmeter pyrometer is most frequently used in galvanizing plants because it is a much simpler instrument and, therefore, easier to adjust and service. This is especially favorable in jobbing plants where the personnel sometimes have difficulty adjusting a potentiometer.

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[a] Metals Handbook, American Society for Metals, Cleveland.

In Fig. 20 is illustrated an x-ray view of an indicating pyrometer. The instrument consists fundamentally of a movable coil mounted between the poles of a permanent magnet. The emf developed by the thermocouple forces a current through the coil, causing it to rotate. The long pointer, attached to the coil, indicates the temperature on the scale.

Although somewhat more complicated, the potentiometer pyrometer has certain fundamental advantages. Usually it is not necessary to calibrate a potentiometer for a definite thermocouple circuit resistance, which is necessary with a millivoltmeter pyrometer. The basic operating principle makes possible a more accurate temperature measurement and the use of a wider scale or chart. The emf generated by the thermocouple is balanced against a known emf from a battery or other source of constant current, so that there is no current passing through the thermocouple circuit.

The question of whether to use an in-

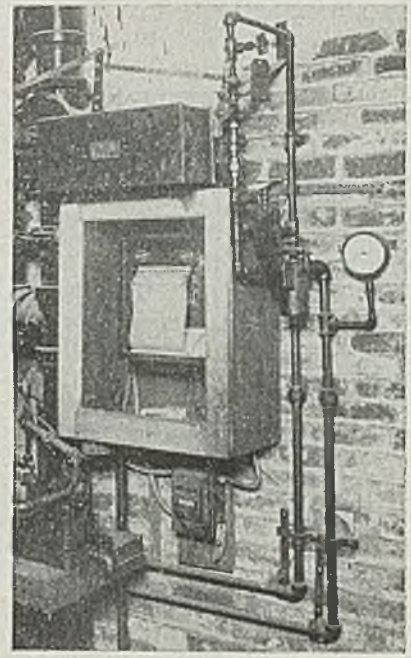


Fig. 19 (right, above)—Recording millivoltmeter pyrometer controller of the 3-position type

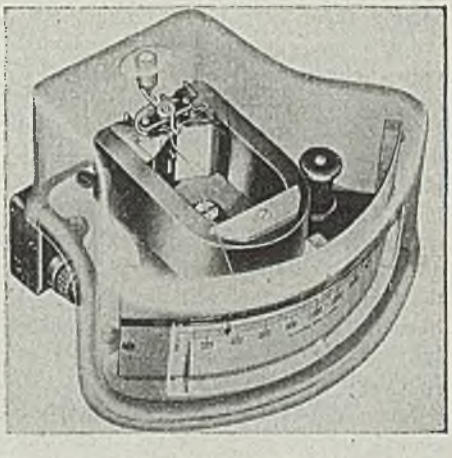
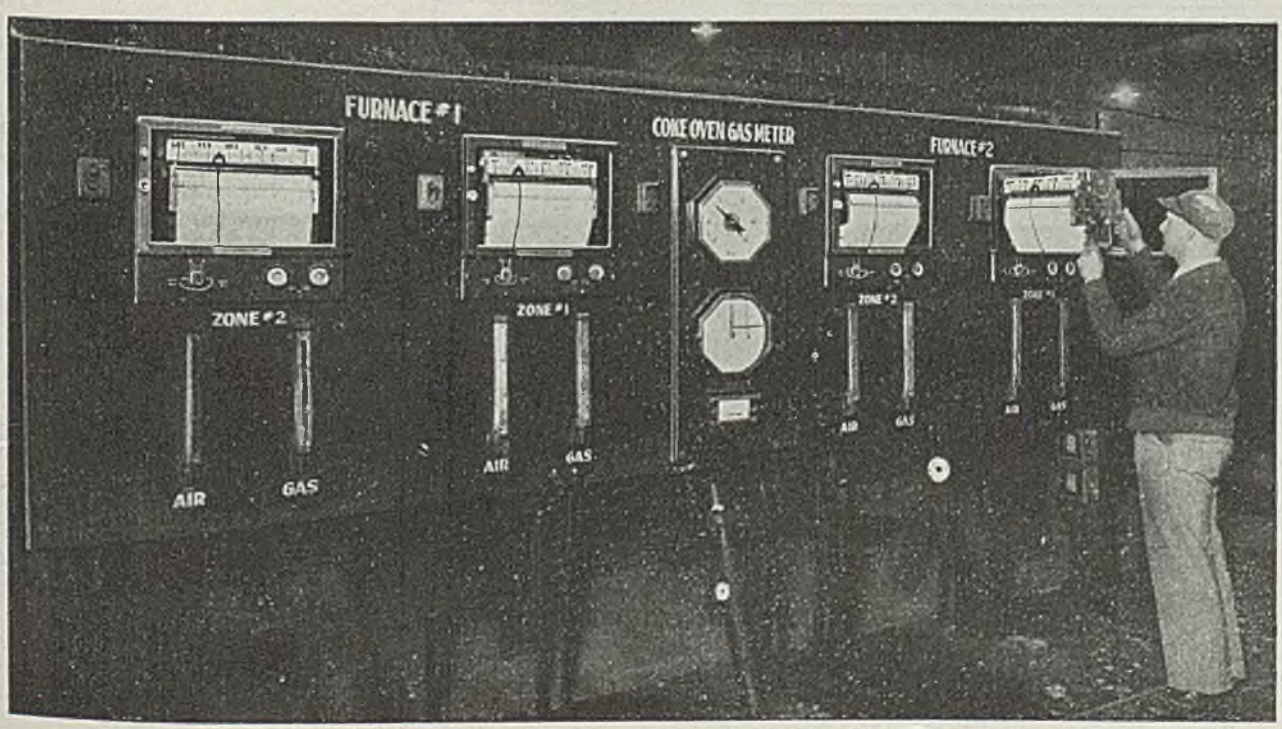


Fig. 20 (right, center)—X-ray view of an indicating pyrometer used in galvanizing plants

Fig. 21 (below)—Modern installation of four pyrometer controllers of air-operated throttling type



dicating or recording pyrometer, or both, on a galvanizing kettle depends mainly on the objective in mind. It is invariably desirable to use a recording pyrometer to provide a continuous, graphic record of the bath temperature. A 2-point recorder is advantageous for recording both the bath and furnace temperatures on the same chart. The chart can be inspected periodically by the superintendent or manager of the plant and he can tell at a glance whether the galvanizer has been maintaining the correct temperatures required for different classes of work, or whether he is operating at unnecessarily high temperatures. A graphic record shows not only the temperature at any one moment but also the temperature trend which aids the operator in firing properly, since he can anticipate coming changes in temperature by observing the trend in the record.

In some instances both an indicating and a recording pyrometer are used on one kettle. If the instruments are both millivoltmeter pyrometers, they may be operated from one thermocouple by connecting them in parallel. Parallel connections are not usually recommended with potentiometers. The indicator is mounted in a convenient location near the kettle where the operator can easily read the temperature. The recorder is generally placed in the superintendent's office or in a suitable location where it will be somewhat protected from acid fumes, dust, and mechanical injury. Because of the large amount of acid fumes present in some galvanizing plants, it is frequently desirable to mount instruments in suitable extra protecting cases.

Many different types of temperature control systems are in use on galvanizing kettles. The type best suited for a particular installation depends on the size and shape of the pot, the design of the furance, and the manner in which it is heated. A large pot is generally more difficult to control than a small one due to the larger mass of metal requiring more time before its average temperature is affected by even a large charge in fuel input to the furnace. This condition is termed "process lag" and is one of the most serious obstacles to automatic control systems.

Process Lag Increased

The process lag is further increased when the kettle has low-heating area compared to its volume, to which also pot failure, caused by local overheating, may often be attributed. On such an installation it is advisable to use a 2-point controller operating from thermocouples installed in the furnace and the bath. The control system should be so arranged that the controlled valve is closed or throttled when the furnace exceeds a certain predetermined temperature, and is not allowed to be opened until the furnace temperature drops below the dangerous point, at which time normal control from the bath thermocouple is resumed. Such an arrangement proves helpful in prolonging pot life.

The simplest type of controller, used on the few electrically-heated kettles in operation, is the so-called "on-off" electric controller. A contact in the instrument completes the circuit to the heating elements in the furnace when the temperature is below the control index setting and breaks the circuit when the temperature is above the index setting. This type controller also may be applied to small gas or oil-fired kettles by using a solenoid or stalled motor valve requiring spring action to close.

A modification of the on-off controller is the 2-position controller in which there are two contacts for operating a motorized control valve requiring power rather than a spring to close the valve.

The principle limitation of on-off and 2-position control is that the controlled valve can assume only two positions, which causes a sudden change of fuel input to the furnace when the temperature at the thermocouple changes only a few degrees. This action usually results in "hunting" or swinging of the temperature above and below the control point. Hunting can be reduced to a certain extent by limiting the movement of the valve by adjusting the mechanical linkage between the motor mechanism and the valve so that a movement of the valve from one limit position to another will cause only a relatively small change in the flow of fuel to the burners. The valve or the motor should be made with special adjustments for this purpose.

Such reductions in the amount of valve movement tend to reduce the surges and the resulting temperature record will show a saw-tooth line of fairly small amplitude. However, the valve mechanism never can be at rest for any length of time since at the low setting, the valve must pass less than the minimum quantity of fuel required to prevent the zinc from freezing during shutdown periods; and at the high setting, the valve must pass more than the maximum quantity of fuel required to hold the zinc at the operating temperature. It follows, therefore, that the valve never can stop in the correct position but must move back and forth periodically.

This inherent limitation suggests a modification, namely, the adding of a third position which should be substantially what is necessary to provide the correct fuel flow required to maintain the bath at the desired operating temperature. This modification requires the control instrument to have three control contacts in place of the high and low contacts in the 2-position controller.

Fig. 19 illustrates a Brown recording millivoltmeter pyrometer controller, of the 3-position type, installed on a 120-ton oil-fired kettle. The controlled mechanism operating the oil and air valves is shown directly above the pyrometer which is mounted in an extra protecting case. Controlling from only one thermocouple installed in the bath near the end of the 32-ft long kettle, the pyrometer holds the bath temperature within close limits, as evidenced by the actual chart record shown in Fig. 17. Two other oil-fired kettles are operated at the same plant, both of which are equipped with Brown

NEW LITERATURE

PIT TYPE CONVECTION FURNACES
By Hevi Duty Electric Co., Milwaukee 1, Wis. An 11-page illustrated bulletin HD-1245.

FAXFILM COMPARATOR
By The Faxfilm Co., 1220 West Sixth street, Cleveland 13. Booklet defines and outlines process and applications.

AUTOMATIC CLUTCH
By Salsbury Motors Inc., 4464 District boulevard, Los Angeles 11. Bulletin No. 4501 giving details.

"KNOCK OUT" UNIVERSAL TOOL GRINDERS & CARBIDE TOOL GRINDERS
By K. O. Lee Co., Aberdeen, S. Dak. Illustrated pamphlet.

TAP EXTRACTORS
By The Walton Co., 94 Allyn street, Hartford 3, Conn. An 8-page illustrated folder.

AIRCRAFT QUALITY GEARS
By Foote Bros. Gear & Machine Corp., 5225 South Western boulevard, Chicago 9. Product engineering bulletin UPA contains data on revolutionary type of gear. 57 pages, illustrated.

METAL ZIPPER ARC WELDERS
By Mid-States Equipment Corp., 2429 South Michigan avenue, Chicago 16. Illustrated folder with specifications.

PRECISION LATHE CONSTRUCTION
By Hardinge Bros. Inc., Elmira, N. Y. Bulletin DV59 with specifications.

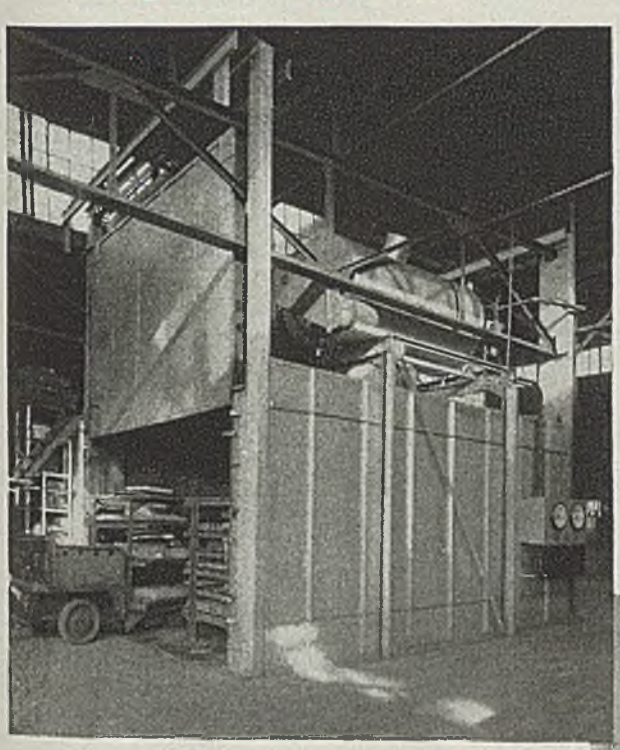
INVARO STEEL DIES
By Firth-Sterling Steel Co., McKeesport, Pa. Bulletin No. SL-2008 gives characteristics and applications in detail.

MACHINE TOOL BASES
By Central Boiler & Mfg. Co., 5818 Rivard street, Detroit 11. A 4-page illustrated folder giving details.

METALLIZING GUN
By Metallizing Engineering Co. Inc., 38-14 30th street, Long Island City, N. Y. A 12-page illustrated bulletin No. 49-10M/11-45.

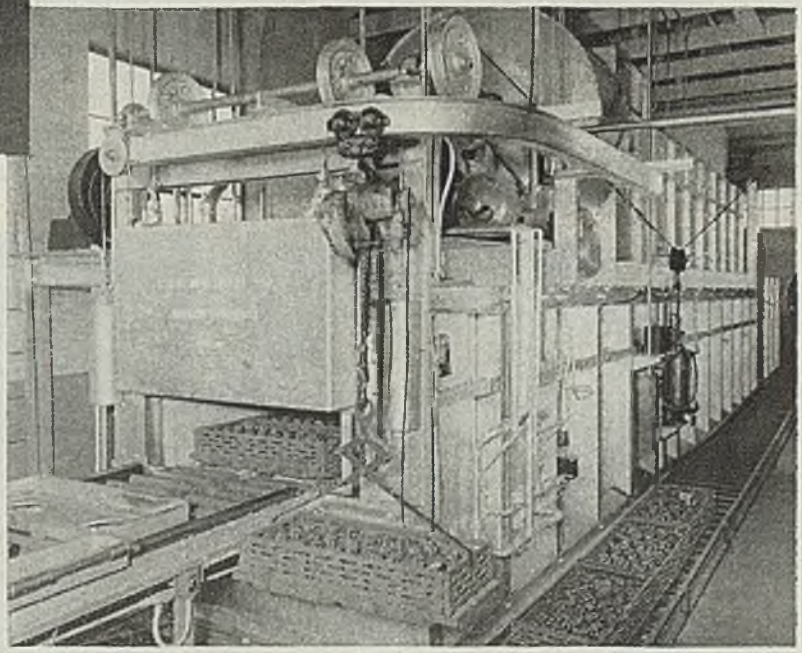
INDUSTRIAL OVENS and FURNACES . . .

"Tailored" to your requirements



For 53 years Maehler engineers have specialized in designing and building industrial ovens and furnaces to meet industry's specific needs. In developing and perfecting the recirculating air heat system The Paul Maehler Company offers industry a line of ovens and furnaces that provide a degree of heat uniformity hard to match. This kind of temperature control assures the user of lower operating costs, greater production and better results.

Whatever your requirements are . . . heat treating, core baking, enameling, etc. . . . remember Maehler builds a complete range of oil fired, gas-fired and electrically heated ovens and furnaces to fit your particular needs. For higher production and lower operating costs call a Maehler engineer. There is no obligation.



The photo above shows a typical Maehler Lift Door Core oven installation. This oven means better cores, baked faster and at lower cost. The view at the right shows a Maehler-engineered air draw furnace used to anneal gray iron castings at the Chambers, Bering Quinlan Co.

MAEHLER

THE PAUL MAEHLER COMPANY

2208 W. Lake Street Chicago 22, Illinois

Industrial Ovens and Furnaces for Core Baking, Mold Drying, Heat Treating, Enameling, etc.

recording millivoltmeter pyrometer controllers of the 3-position type.

Even 3-position control has certain limitations since, in order to get ideal control, the controlled valve when in its middle position, should pass approximately the right amount of fuel required to maintain the bath at the desired temperature. Otherwise, 3-position control performs substantially the same as 2-position or on-off control as the valve must move continually back and forth between the low or high and middle positions. Therefore, in order to get the best possible results with 3-position control, the middle position of the controlled valve should be readjusted each time the control point is changed.

There are certain controllers on the market that obviate the shortcomings of 2 or 3-position control by imparting a throttling action to the fuel valve, making possible a larger number of valve positions. These throttling controllers operate electrically or pneumatically. Instead of the high, low, and middle valve positions possible with 3-position control, the controlled valve may assume any number of intermediate positions by the magnitude of the temperature deviation from the control point. For instance, if the bath temperature drops, say 2° F the valve may open 10 per cent; and if the bath temperature continues to drop, the valve will open still further. Thus, if the controller is adjusted properly, the valve will continue to open until the bath temperature is brought back to the control point.

Four Pyrometer Controllers

A modern installation of four recording potentiometer pyrometer controllers, of the air-operated throttling type, is shown in Fig. 21. These instruments are installed on two pots having two zone furnaces.

It is a well-known fact that continuous immersion in molten zinc is severe service for all metals. Numerous tests have been conducted to ascertain the best material for this service. Many different metals and alloys have been tried, including different compositions of nickel and chromium alloys of iron. As far as known, all tests have shown that no metal will continuously stand this service. Wrought iron is as good as any and is cheap.

However, this thermocouple cover if coated with the same fused-in vitreous coating lately developed for the lining of galvanizing kettles, referred to in a previous chapter, will resist the zinc permanently.

An angle-type thermocouple, shown in Fig. 18, is invariably used on galvanizing kettles and other pot furnaces. The lower leg of the thermocouple, which is immersed in the bath, should be protected by an outer sheath of extra-heavy wrought iron, coated as previously sug-

(*Please turn to Page* 155)

Oxygen Now Used in Firing Open-Hearth Furnaces

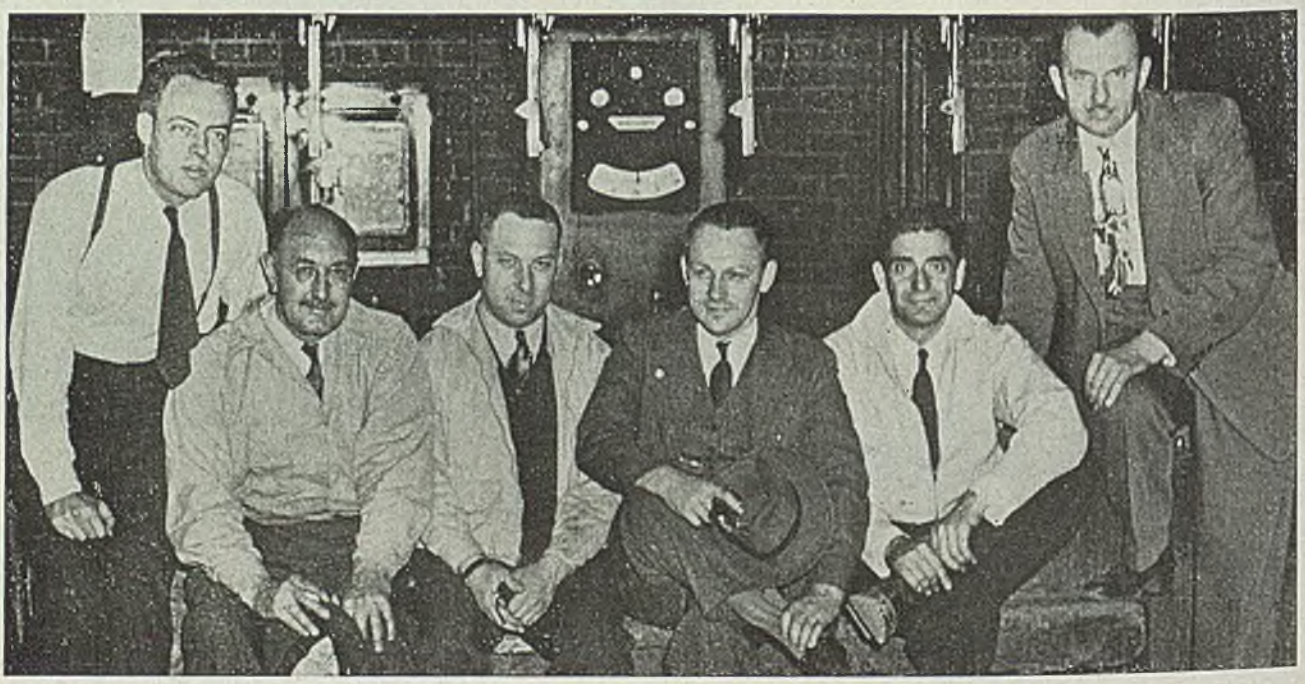
USE of tonnage oxygen in the steel industry bids fair to be classed as a development of major importance.

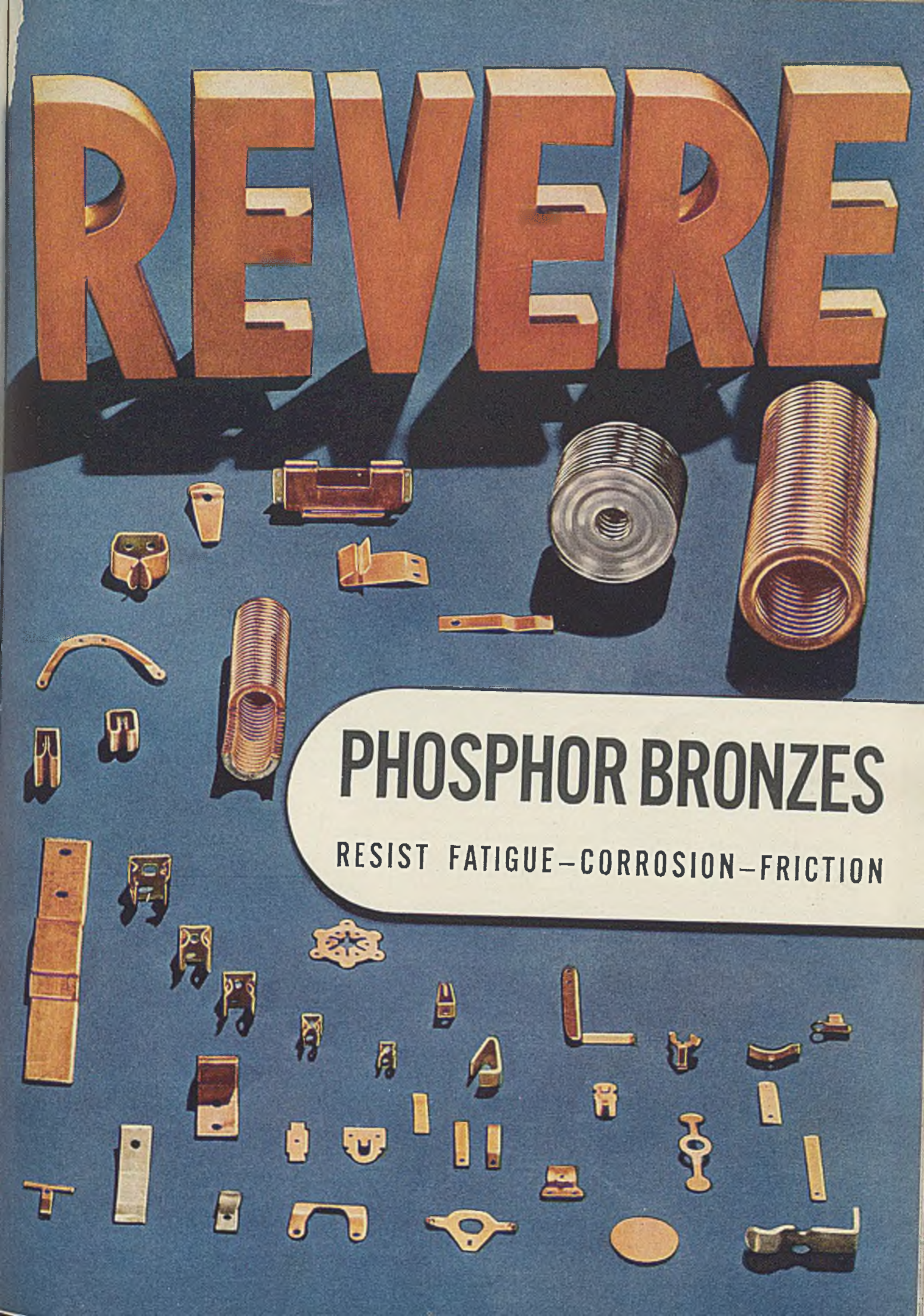
The possibility of substantially greater steel production from existing facilities through the use of oxygen in open-hearth furnaces is indicated by results obtained from large-scale tests conducted in Canada.

The tests, which were witnessed by operating executives of many American steel companies, were conducted in a 150-ton furnace at the Hamilton, Ont., plant of the Steel Co. of Canada. Oxygen was introduced into the furnace in a novel way so as to produce a controlled flame which was directed at the furnace charge during the meltdown period. No apparent effect on the furnace lining was noted.

Tests already conducted have proved that scrap melting time can be substantially reduced and there seems little doubt that production from existing furnaces can be stepped up appreciably with no expenditure for extra capital equipment. However, many plants, in order to take full advantage of this development, may have to make some alterations to speed up their scrap-handling facilities considerably.

Among those active in conducing the test program were E. T. W. Bailey, combustion engineer, Steel Co. of Canada; F. G. Kerry, manager, Development and Engineering Department, Canadian Liquid Air Co. Ltd.; and, G. V. Slottman, manager, Technical Sales Division, Air Reduction Co., New York. This new development was first put into application by the Steel Co. of Canada and the Canadian Liquid Air Co. Ltd.




REVERE
PHOSPHOR BRONZES
RESIST FATIGUE–CORROSION–FRICTION

UNIQUE ADVANTAGES OF REVERE PHOSPHOR BRONZES

True Bronze. Revere Phosphor Bronzes are true tin bronzes, containing from 1¼% to 10% tin. The phosphorous content is a mere trace, not over .05%. Phosphorous is used as a deoxidant during alloying, to prevent the formation of oxide films at grain boundaries. The absence of such films permits the material to be used at its maximum strength and fatigue resistance.

High Strength. Tensile strengths up to 133,000 psi. are obtainable, and yield strengths of 70,000 psi. or higher.

Fatigue Resistance. The combination of careful manufacturing methods with correct analysis gives Revere Phosphor Bronzes endurance limits remarkable among metals. Phosphor Bronze parts retain their dimensions, elasticity, or "springiness" through many millions of stress reversals. Grade C, 8% phosphor bronze, for example, should stand over 100 million reversals at 25,000 psi. See chart.

Coefficient of Friction. Low. Resists galling. Excellent materials for bearings, bearing plates, and shafts.

Resists Corrosion. Revere Phosphor Bronzes are comparable to copper and copper-silicon alloys in corrosion-resistance. They are highly resistant to a great variety of corrosive conditions and chemicals, and are practically immune to season cracking or stress corrosion.

Electrical. Depending upon the grade, phosphor bronzes have electrical conductivities from 11 to 13% I.A.C.S., at 20°C. They are largely employed in switches and contacts requiring heavy pressures, and are much less affected by arcing than are alloys containing zinc. They are non-magnetic.

Easy Workability. Phosphor bronzes are easily fabricated by the usual processes of punching, stamping, drawing, machining, and so on. In the fully annealed state they are extremely ductile.

Four Grades. See table. These grades offer a variety of characteristics, enabling selection of the correct material for various uses. In general, Grades A and C are used for springs, diaphragms, bellows, fuse clips, lock washers, clutch discs, and similar applications requiring high fatigue resistance. Grade D is selected where the highest strength and spring qualities are required. Grade E is principally used in heavy bars and plates to withstand severe compression, wear and corrosion. Grades A and D are also used in welding rod.

Cast Reduction. If you are now employing some other material, investigate phosphor bronzes, as they may be cheaper while providing equal if not better service. On the other hand, if you are now using a less expensive material, such as spring brass, the greatly superior qualities of phosphor bronzes may make them cheaper in the long run.

Cooperation. Revere Technical Advisors will gladly work with your engineers and designers in determining the best ways to use phosphor bronzes. Such collaboration may at times be extremely valuable, since some of the factors involved in correct design may seem illogical. For example, contact pressure depends upon thickness, not temper. Increasing the temper does not increase pressure, but permits larger deflection without permanent set, and so does decreased thickness. Careful balancing of temper and thickness are essential for best results. Revere really knows phosphor bronzes, and it will pay you to write Revere when considering their use.

TYPICAL APPLICATIONS

Fuse Clips — Contacts — Radio Trimmers — Springs — Diaphragms — Pressure Plates — Bellows — Flexible Hose — Latches — Relay Parts — Bearing Plates — Sliders — Electric Lamp and Radio Tube Sockets — Clutch Plates — Thrust Washers — Grease Retainers — Paper Mill, Oil Well, Textile, Leather, Laundry, Pump, Printing, Refrigeration, Marine, Automotive Parts and Machines.

Wherever these qualities are needed in a non-ferrous metal: Strength, Resilience, Fatigue Resistance, Corrosion Resistance, Low Coefficient of Friction, Easy Workability.

AVAILABLE FORMS

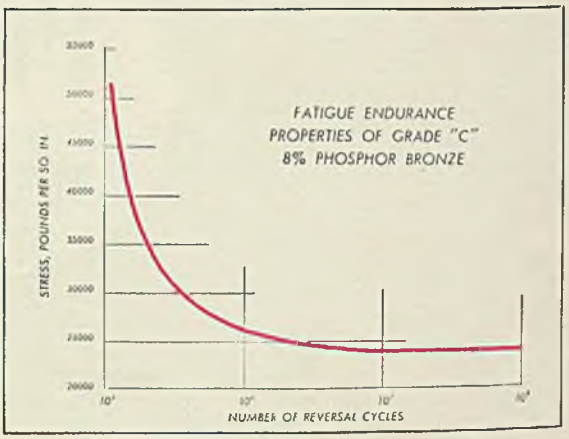
Grade A: Sheet, Strip, Plate, Rod, Welding Rod
Grade C: Sheet, Strip, Plate
Grade D: Sheet, Strip, Plate, Welding Rod
Grade E: Strip, Plate

in customary or special shapes, sizes, tempers and finishes.

PHYSICAL PROPERTIES—PHOSPHOR BRONZES

Grade	Tensile Strength Lb. per Sq. in. Hard*	Tensile Strength Lb. per Sq. in. Soft	Yield Strength‡ Lb. per Sq. in. (Nominal) Hard	Yield Strength‡ Lb. per Sq. in. (Nominal) Soft	Rockwell "B" Hardness Hard	Rockwell "B" Hardness Soft	Endurance Limit Lbs. per Sq. in Hard	Endurance Limit Lbs. per Sq. in Soft
"A" 5%	91,000-105,000	40,000-55,000	65,000	18,000	88-96	0-50	22,000	14,000
"C" 8%	105,000-118,500	53,000-67,000	68,000	24,000	95-102	20-70	25,000	21,000
"D" 10%	115,000-129,000	58,000-73,000	70,000	28,000	98-104	25-75	27,000	23,000
"E" under 4%	65,000 (Nominal)	40,000 (Nominal)	50,000	14,000	75 (Nominal)	5	18,000 (Estimated)	13,000

*Spring temper or 8 Nos. Hard ‡.5% extension under load



REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

Mills: Baltimore Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y.

Sales Offices in Principal Cities, Distributors Everywhere

Tachometer

Metron Instrument Co., 432 Lincoln street, Denver 9, recently placed on the market three synchronous speed tachometers which have an extremely low torque—so low that it does not disturb the system being tested. Without gears or flyballs, the head of the instrument registers speed by a contact making mechanism operated by rotation of

spindle. Mechanism periodically charges a condenser through a direct-current milliameter which indicates average current.

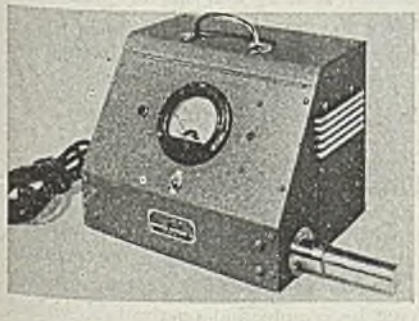
Type 48A tachometer is for speeds from 1700 to 2200 rpm, or for speeds of 3400 to 4400 above synchronism. Type 48B registers from 1500 to 2000 rpm and 48C from 1550 to 2050 rpm. The latter two types measure speeds of 3000 to 4000 rpm and 3100 to 4100 rpm respectively over synchronism.

Operation is from 115 v ac power without vacuum tubes. Instruments require no warm-up and are stabilized against line voltage fluctuations.

Steel 9/9/46; *Item No.* 9562

Radiation Meter

Radiation intensity meter developed by Geophysical Instrument Co., Key boulevard and Nash street, Arlington, Va., is a compact electronic device giving an audible and visual indication when



too great a concentration of radium makes working conditions unsafe. Calibration of instrument is based on standard agreed upon for maximum safe dosage—for persons exposed to penetrating rays from radium during an 8-hour working day.

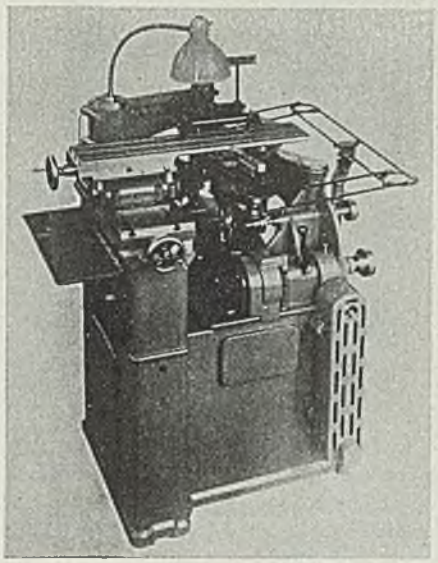
Meter on sloping panel of instrument gives a constant indication of intensity of penetration rays in vicinity. Alarm sound is intermittent, its frequency increasing with greater intensities.

Automatic voltage regulation makes calibration unaffected by line voltage changes as much as 15 in either direction.

Steel 9/9/46; *Item No.* 9568

Profile Grinding Machine

A machine for grinding profiles of hardened work pieces such as profile gages, form tools, sectional dies, etc. is being by manufactured by Fritz Studer Ltd., Glockenthal-Thun, Switzerland,



represented in this country by Cosa Corp., 5000 Chrysler building, New York 17. Flat work pieces of 2 in. thickness, 5.9-in. length and 4 in. in diameter can be ground to a precision of 0.0002-in.

Principle of operation consists in following form of a template, enlarged in suitable proportion, by means of a tracer finger swivelling about its point. For grinding of clearance angles of a form tool, latter is fixed on inclinable work piece rest, which is inclined to required angle and template table is tilted to same angle.

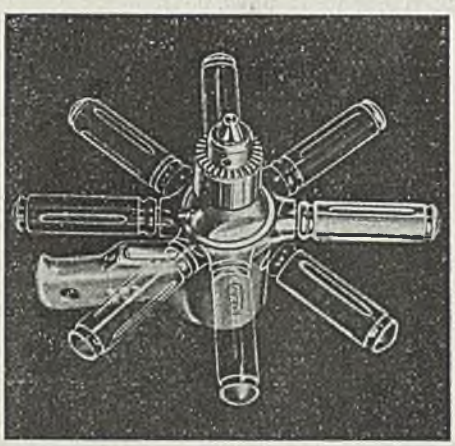
Steel 9/9/46; *Item No.* 9650

Air Powered Drill

An air-powered ½-in. drill, model 7016, designed and manufactured by Aro Equipment Corp., Bryan, O., includes specifications demanded for heavy duty, continuous-production jobs, yet is light in weight.

Drill is equipped with an auxiliary handle that can be located in any position around nose of tool. To locate handle, which threads into a shoe located in ring on nose housing, operator loosens handle with one-eighth counter-clockwise turn, moves to desired position, then locks handle securely by one-eighth clockwise turn.

Other features include large ball bearings which cushion action of all moving



parts and built-in automatic oiler. Speed is 1000 rpm.

Steel 9/9/46; *Item No.* 9565

Lead Comparators

Line of production lead comparators for use in gear production shops has been introduced by Michigan Tool Co., 7171 East McNichols road, Detroit. Known as models 1200 and 1200A, the comparators are for use on the production floor alongside gear cutting and shaving machines. Master multiple thread lead, followers, indicators and actuating mechanisms are all enclosed.

Machines may be used to aid setting up gear cutting and finishing machines, to check gears after processing, to determine lead compensation for "unwind-

ing" of gears during heat-treating, etc. They are applicable to both external and internal gears as well as worms.

Quick mounting is made possible by use of tapered expanders and split bushings to secure gear, no tools being required for this operation. A gear may be checked in both green and finished state by using corresponding size of bushing

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 148.)

for the inside diameter of the gear.

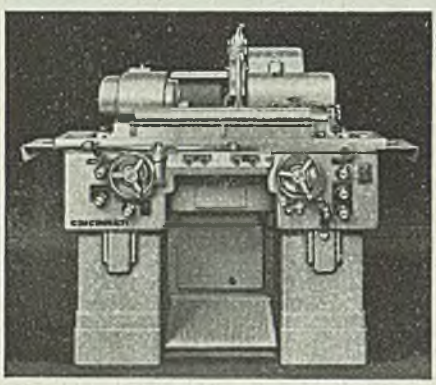
One type multiple lead master has four threads for checking four points on periphery of the gear. Master leads are ground to a high degree of accuracy.

Graduated in increments of 0.0001-in., both idicators have a common pivoted contact point, with sufficient clearance between the two so that only one operates at a time. To check internal gears, a "goose-neck" contact point is inserted in contact point extension, as shown at left.

Steel 9/9/46; *Item No.* 9587

Hydraulic Grinder

Designed for precise center-type grinding operations on small diameters, the Filmatic 4 in. plain hydraulic grinding machine, built by Cincinnati Grinders Inc., Cincinnati 9, can be provided with hand or automatic type hydraulic infeed mechanisms which give machine high productive capacity. Controls are conveniently placed and easy to operate and kneehole



in front of bed permits operator to be seated while working.

Bed of machine is ribbed one-piece casting of box-type construction. Hydraulic oil compartment is integral with base, completely sealed against dirt or grit and coolant reservoir is in adjoining compartment.

Hand traverse has a 2-speed arrangement to permit rapid positioning for set-up purposes, or slow hand adjustment for shoulder grinding. Power table traverse is hydraulically actuated and rates are variable from 3 to 280 ipm. A single lever control starts power table traverse, simultaneously starting headstock rotation and coolant flow. Dog-operated table reverse is accurate within 0.001-in.

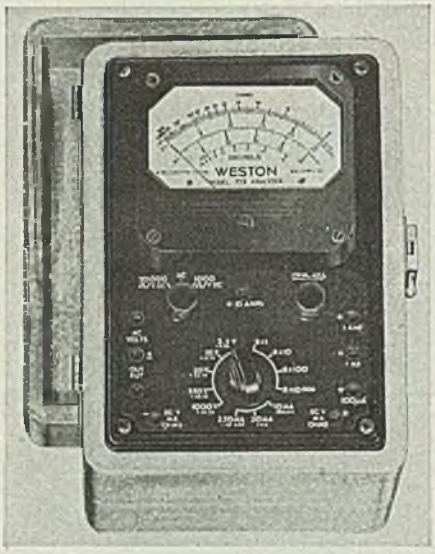
Enclosed motor is carried on a vibration-proof, hanged type mount with a one-hand positioning knob to simplify speed changes and belt tension adjustments. Instant stopping of spindle rotation is provided by a spring-actuated, shoe type brake. Grinding wheel spindle is mounted on bearings which assure dead-center rotation. Two V-belts transmit power from motor to spindle. Sheaves have four grooves in two diameters.

Machines are available in 4 x 12 in. and 4 x 18 in. sizes, net weights being 3600 and 3700 lb respectively, not including oil and coolant weight.

Steel 9/9/46; *Item No.* 9768

Electronic Analyzer

A new analyzer, announced by Weston Electrical Instrument Corp., Newark, N. J. has five completely overlapping alternating and direct current voltage ranges, seven direct current ranges, four direct curent resistance ranges, and five decibel ranges. Each was selected to provide maximum adaptability in all require-



ments of electronic testing and maintenance. Direct current voltage ranges are available at a dual sensitivity of 1000 or 20,000 ohms per volt.

Resistors are either wire wound or 1 per cent ceramic resistors. Readings are taken on a standard 4 in. rectangular 50 microampere instrument and alternating current measurements are made possible through a temperature-compensated full-bridge copper-oxide rectifier designed so all readings are made on a single scale arc.

Steel 9/9/46; *Item No.* 9502

Air-Gas Mixer

Production of a high efficiency constant-ratio mixer for low pressure air and gas is announced by Industrial Division of Bryant Heater Co., Cleveland. Called the Flomixer, it utilizes energy of a stream of air at pressures up to 3 lb to entrain a combustible gas and to deliver mixture at unusually high pressure to burners it supplies.

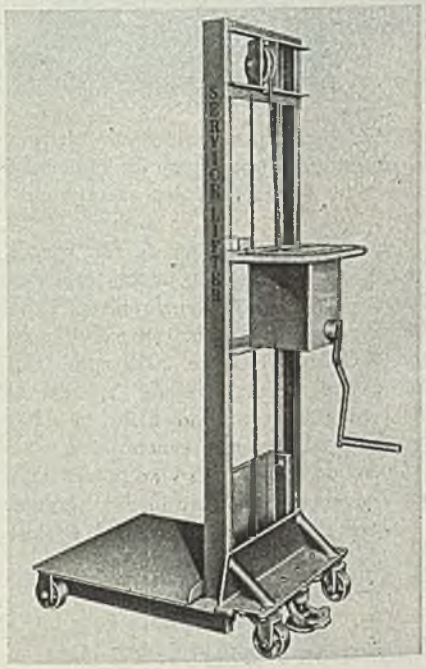
Offered in pipe sizes from ¾ to 4 in., its efficiency is due to improved design of internal contours and proportions. An air supply of 1 lb pressure will produce a mixture pressure of 13 in. water column with natural gas, 11½ in. with manufactured gas.

Gas ratio adjuster is a universal type, suitable for any type of gas. Gas from 550-3200 Btu can be handled with no change of equipment.

Steel 9/9/46; *Item No.* 9504

Portable Elevator

An entry in portable elevator field is the service shop lifter manufactured by Service Caster & Truck Division of Domestic Industries Inc., Somerville, Mass. Complete with floor lock, it can be used as a die table, lifter and transporter of heavy fixtures, for tiering boxes, and for raising tote boxes, draining drums, positioning heavy work, installation of



machine parts and for loading and unloading motor trucks.

Lifting platform is cranked up and down, while an automatic clutch locks load in any position. Overall height of elevator is 6 ft and lift of platform is 4 ft 8 in. from lowered height of 5½ in. Platform measures 24 x 24 in. and capacity is 500 lb.

Steel 9/9/46; *Item No.* 9570

Unscrambling Table

To systematically and automatically unscramble a carton, box or crate of bottles or other similar containers which have been unloaded on the table, Island Equipment Corp. of 101 Park avenue, New York 17, recently placed on the market a straight line unscrambling table. This unit makes it possible for one

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 148.)

Peace*

. . . yet much remains
To conquer still; peace hath her victories
No less renowned than war . . .

Milton

*In commemoration of our Victories, concluded by Presidential proclamation, September 2, 1945.

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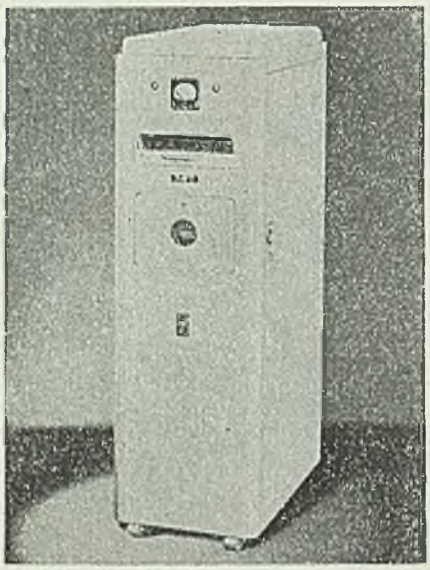
operator to unload from 60 to 240 or more containers per minute from carton onto conveyor and discharge them to filler in single line.

Steel 9/9/46; *Item No.* 9548

Heating Unit

The 18XO portable Thermax Red Head high frequency dielectric heating unit, built by Thermex Division of Girdler Corp., Louisville, Ky., has an output of 1 kw and will raise temperature of approximately 1 lb of average general



purpose material 170° F in 1 min. Its rapid and uniform preheating shortens molding cycles, and reduces number of rejects. Control is completely automatic.

Heavy gage steel cabinet is 16¼-in. wide, 27¼-in. deep and 52¾-in. high. The 10¼ x 13 in. preform tray, which serves as bottom electrode is an aluminum plate. Upper electrode is 7½ x 7½-in. stainless steel wire mesh. Spacing between electrodes is adjustable from ½ to 3⅜ in. Closing the drawer turns on the high frequency energy.

Steel 9/9/46; *Item No.* 9558

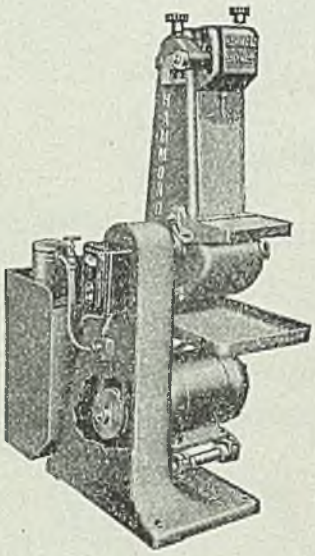
Abrasive Belt Grinders

Hammond Machinery Builders Inc., 1600 Douglas avenue, Kalamazoo 54, Mich., is introducing three new abrasive belt grinders capable of operation either wet or dry for grinding, polishing, deburring and beveling on a wide variety of materials.

Model VH-6WP (illustrated) may be used in either a vertical or horizontal position and has its own coolant tank. Its work table tilts 15 degrees up and 30 degrees down for angular grinding. The 6 in. belt is driven by a 2-hp motor. A variation of this machine, model VH-6D is for dry grinding only.

Consisting of frontstand with ball bearing spindle for contact wheels and one right and one left hand backstand, the model 5 grinder-polisher uses belts 60 in. in length and 3 in. wide. Provision is for horizontal dry grinding only.

Abrasive belt grinder-polisher model F-2 is for belts 48 in. in length and up to 2 in. in width. Made for dry

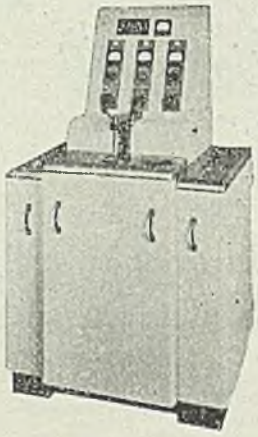


operation in either a horizontal or vertical position, machine table can be tilted for angular work. Its 1800 rpm, 1/3-hp motor is mounted integrally with unit.

Steel 9/9/46; *Item No.* 9609

Electropolisher

Central Scientific Co., 1700 Irving Park road, Chicago 13, recently developed a Cenco-Hangosky electropolisher for polishing and etching metallurgical speci-



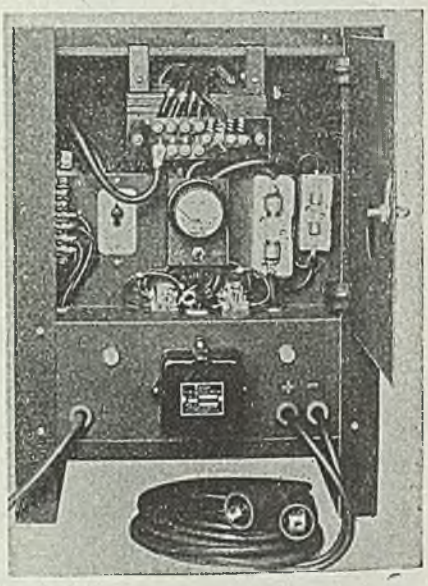
mens for microscopic examination. Samples are prepared by electropolisher from such substances as low and high carbon and stainless steels, and cast iron, nickel and nickel alloys, bearing metals, copper, brass, aluminum, zinc, cadium and other metals and alloys.

Apparatus is housed in a metal cabinet with inclined control panel containing knobs and meters for control of polishing and etching time and current. A water fountain cools and washes sample. Unit requires either 115-v or 230-v 60-cycle ac.

Steel 9/9/46; *Item No.* 9512

Truck Battery Charger

An automatic 2-rate industrial truck battery charger to provide unattended charging for either lead-acid or Edison type batteries is being offered by Federal Telephone & Radio Corp., Newark, N. J.



Known as FTR 9202-AS, it plugs into any 105-125 v, single phase, 60 cycle ac supply line and will charge 6-cell, 250 amp-hour, lead-acid batteries to their full capacity in 8 hours and 10-cell, 250 amp-hr Edison batteries in 7 hours. Dual charging feature broadens choice of battery equipment. Toggle switch located inside door to cabinet determines method of charge control. To operate, charging leads are clipped to battery, switch is used to select desired charging cycle, and time switch is set to number of hours required for charge.

Steel 9/9/46; *Item No.* 9572

Hydraulic Press

A hydraulic press for pressing, bending forming, straightening and other operations is announced by Munton Mfg. Co., 9400 Belmont avenue, Franklin Park, Ill. Operated by a foot power unit, press is offered in six models with capacities ranging from 5 to 25 tons.

Unit is of all steel welded construction. Tempered steel platen is hollowed for receiving fixtures. Work up to 18 in. diameter may be accomodated. Ram

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stroke of the press is 10 in.

Press is operated with no outside power required as hydraulic system is fully incorporated into design and is self-bleeding. Stand for holding press is available as is a pressure gage to show both system and ram pressure.

Steel 9/9/46; *Item No.* 9371

Step Chuck

Gilbert Baker Midlam Co., Dayton, O., is manufacturing a step chuck and closer combination for certain Atlas, South Bend, Logan and Clausing lathes. This combination provides a closing sleeve threaded for spindles of these lathes with a tapered ring operating on tapered head of step chuck.

Step chuck head, being unhardened, can be bored with a series of steps to fit any work to be held until entire head-thickness capacity is exhausted. Threaded shank, hardened and spring-tempered to open stepped chuck jaws when released, screws into standard draw bar of lathe, which operates step chuck like a collet. Chuck and closer will handle work up to 2¼ in. diameter.

Steel 9/9/46; *Item No.* 9559

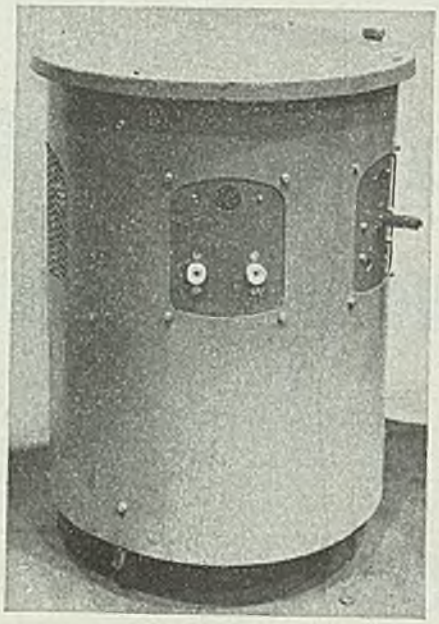
Mobile Brazer

Designed for general brazing service, a new 20-kva portable brazer with water-cooled tongs is announced by Westinghouse Electric Corp., Pittsburgh. Entire unit is self-contained. It includes a contractor for energizing or de-energizing brazing circuit, an adjustable heat brazing transformer and a watercooling system for tong cooling water.

Diameter of unit is small (24 in.) so that it can be used in cramped quarters. A clamp type entrance bushing is provided on rear for incoming primary cable.

Control panel, built into front, contains a control switch, outlets for brazing cables, receptacle for foot switch pilot cable, and voltage tap changing plug. Foot switch controls length of time during which current is applied.

Transformer is air cooled by induced



draft drawn into brazer through openings under top cover, pulled through transformer and expelled through screened openings in bottom of case.

Steel 9/9/46; *Item No.* 9560

Soldering Iron

A soldering iron with a built-in heat control to maintain constant heat at all times and to prevent overheating is announced by Sound Equipment Corp. of California, 3901 San Fernando road, Glendale, Calif. Called the Kwikheat because it heats up in 90 sec with a 225 w quick heating element, this iron has a hard-chromium plated shell and a cool plastic handle.

Steel 9/9/46; *Item No.* 9374

Air Hoist

Designed for any lifting job in 1/4 and 1/2 ton capacity range, a new lightweight portable air hoist is announced by Keller Tool Co., Grand Haven, Mich. Weighing only 30 lb, it has a lifting capacity of 1000 lb at 17 fpm and proportionately greater speeds for lesser loads.

Steel 9/9/46; *Item No.* 9401

Box Jigs

New box jigs announced by Chicago Drillet Corp., 928 South Michigan avenue, Chicago, are said to offer savings in cost and time ordinarily required in constructing a jig body. They can be used in all phases of drill press operations, and are being produced in 150 different sizes, square and rectangular shapes, to accommodate all variations and ranges up to 6 in. capacity.

An advantage is that jigs can be used on all six sides by virtue of their removable sides together with thumbscrew and leaf arrangement. In operation, turning thumb screw and raising leaf is all that is necessary to open jig to receive a part.

Following features enable jigs to withstand continued service: All steel corner posts; all sections surface ground; easily dismantled and reassembled without loss of accuracy; interchangeable and replaceable side plates, end plates and leaves; square and parallel to within 0.0005-in. which permits use for precision parts of all types.

Steel 9/9/46; *Item No.* 9593

FOR MORE INFORMATION on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

Circle numbers below corresponding to those of items in which you are interested:

9562	9504	9572
9568	9570	9371
9650	9548	9559
9565	9558	9560
9587	9609	9374
9768	9512	9401
9502		9593

9-9-46

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PRODUCTS MADE .....

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TUNGSTEN has made a sturdy growth.

Tempests have come and gone, leaving inevitable changes and destruction behind them. Substitute materials and new developments threatened to dislodge Tungsten as the standard alloying element in wide and varied fields of use; but it is now more surely established than ever.

One such field is that of high-speed steels in the manufacture of cutting tools.

In the realm of powder metallurgy, metal-cutting Tungsten carbides alone have come to represent an industry of impressive proportions.

Applications that were forbidden by war-time economy are resumed, now that supplies are adequate.

Integrated production and an adequate source of Tungsten products, both metallurgical and chemical, are offered by the Molybdenum Corporation. Technical advice is at the service of users. Specific information on Tungsten, Molybdenum, and other MCA alloying materials is available in printed form, on request.

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MOLYBDENUM CORPORATION OF AMERICA

GRANT BUILDING PITTSBURGH, PA.

MCA

Pneumatic Fatigue Test

(*Continued from Page* 113)

frequency for the greater part of the test, but for some time before a visible crack appears the chart reveals a gradual decrease in frequency. Point at which the frequency deviates from a horizontal line is taken as the indication of the point of incipient failure. As may be expected, x-ray and Zyglo tests fail to detect any crack if the piece is examined at this time. An increase in the number of stress reversals, however, will cause the crack to appear and later become visible. In some pieces an internal flaw may be the origin of this incipient failure, and the crack will take longer to appear at the surface.

Most recent information indicates that brittle materials show this point of incipient failure after 90 to 99 per cent of the total time to fracture, while in some of the more ductile forged samples it may appear at 70 per cent of the total time, depending upon the applied stress. The slope of this decreasing frequency curve may be taken as an indication of the rate of growth of a crack through a particular alloy at a given stress. Samples made from various alloys show an appreciable difference in rate of crack growth. This phenomenon deserves, and will receive considerable attention in the future.

Torsional Fatigue: A torsional fatigue testing machine for both room and elevated temperatures is shown schematically in Fig. 1. This machine has a very stable driving mechanism and, again, there are no parts to wear out. The test piece (A) is a vertical shaft with a small flywheel (B) at the upper or free end. On this flywheel are two pistons (C) diametrically opposite and with their axes on an arc having the same center as the wheel. The cylinders (D) are also formed on this same arc so that the pistons may enter them without touching the walls. In this case, the operation is the same as the cantilever machine except that the air impulses are in phase rather than 180 degrees out of phase. When two pistons are used, it is important to keep them in phase, otherwise a bending moment is superimposed on the torsion. It is, however, possible to use two sets of opposed pistons diametrically opposite each other and then have the cylinders adjusted to one-half a wavelength.

Test piece in Fig. 1 has a 0.500-in. diameter by 2.50-in. long test section. Natural frequency of the test assembly is 230 cycles per second. The angular displacement is read optically and the frequency electrically.

Fatigue of Thin Strip: Recently, a miniature fatigue machine was built. It is of the opposed cylinder type but, as

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We've packed in an extra pound of carbon dioxide, compared with the Model 4

—We've knocked 2 1/2 pounds off the average charged weight!

The NEW Model 5 Extinguisher

And . . . this harder-hitting, lighter-weight extinguisher *costs no more* than the Model 4 it replaces!

The new Kidde Model 5 *adds* the advantage of increased flame-killing power . . . *retains* the features that led to the widespread popularity of the Model 4. Such features as:

Simple trigger control . . . just aim at the fire, pull the trigger. Fast attack on incipient fires in flammable liquids or electrical equipment. *Complete* freedom from extinguishing-agent damage . . . the dry, clean carbon dioxide cannot corrode metals, harm materials, contaminate liquids. No after-fire mess to clean up.

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it is designed for vibrating strip 0.002-in. thick, it cannot have pistons because they would reduce the natural frequency to too low a value. Therefore, this is designed so the strip acts as its own piston. This machine has operating frequencies of from 300 to 1200 cycles per second thus making the time of testing very short. Ten million stress reversals may be obtained in less than an 8-hour day.

The test piece for this unit is a 0.25-in. wide strip of the required thickness; the length may vary from 0.5-in. to 1.25 in., depending upon the frequency desired. It is not necessary, therefore, to use a specially machined sample.

REFERENCES

[1]Messrs. C. F. Jenkins and G. D. Lehman used a pneumatically-driven fatigue machine for obtaining very high frequency tests. ROY. SOC. PROC. 1929.

Fatigue Testing Machine Operates Pneumatically

Originally developed to test gas turbine buckets, a pneumatically operated fatigue testing machine, a product of Schenectady Works Laboratory of General Electric Co., Schenectady, N. Y., operates on a principle similar to that of a slide trombone. Said to have proved so efficient and adaptable that it will have many other applications, the instrument has an extremely simple operating mechanism consisting of a tuned air column in which the tuning is accomplished by decreasing length of air path.

Part to be tested is placed in position between the two air paths or tubes so that air from open ends strikes the upper end of sample piece, setting it to vibrating. Sample vibrates unit it fatigues to extent that its vibrations are out of phase with those of the tuned air in the other tube and a break occurs.

Thus far, the tester has produced stress as high as 100,000 psi. Three models have been built, the company states, the one described above, one for torsion testing and one for strip testing.

Heat Resisting Metals For Gas Turbine Parts

Final report in a series covering Navy-sponsored research on 96 heat resisting alloys in 12 contracting laboratories was recently released by the government.

High temperature data in tabular or graphic form cover alloys tested at 1350, 1500, and 1600° F, together with research information on chromium, tungsten, and molybdenum-rich alloys. Submitted as part of a program to develop better heat resisting metals for gas turbine parts, 223-page paper can be obtained from Office of Publication Board, Department of Commerce, Washington.

Selling Prices

(*Continued from Page* 116)

bench-work or inspection. Use of one overall average rate or a series of separate rates would make little difference if each customer's order went through all the operations in the plant in the same proportion. Such a condition is almost never found in actual practice, therefore it is necessary in calculating the cost of a particular order to have separate burden rates for operations through which that particular order goes.

Accompanying chart of accounting plan, Fig. 1, shows how burden should be developed. Plant is divided into logical departments and production centers. Subsidiary operations or service centers such as heat, power, repairs, plating, hydraulic pressure, air compressors, gas for welding, and annealing furnaces should be kept separate from production centers. For each of these an operating cost will be determined in the same manner as for a production center.

For each production or service center the burden will be made up of the following items: Rent for floor space (land and buildings factor), rent for equipment (equipment factor), power, repairs, indirect labor, supplies and expenses and part of general manufacturing burden.

Calculating Burden Rate

Rent for floor space will include interest on the investment in land and buildings, taxes on land and buildings, insurance, depreciation, repairs of buildings, cost of heat, light and elevator power, watchmen, cleaning and other building expenses. The total of such cost divided by the square feet of available space gives a rate per square foot to be charged to the production or service centers for the space occupied by each.

Rent for equipment includes interest on the investment, insurance, depreciation, and taxes—if local or state taxes are in part based upon the value of equipment.

Inclusion of interest on investment as a part of cost gives more accurate relative costs of different departments or production centers and of different customers' orders. Any thoughtful operator realizes that interest is an important element in the cost of operating a press worth $25,000 as compared with the operation of a spot welder.

Cost of the service centers and subsidiary operations should be kept separate from the production centers. Each service and subsidiary operation will have charges for rent of floor space and equipment, for repairs, for total labor, supplies and expenses, to give the total operating cost. This total cost will then be distributed on a fair basis to the sev-

eral production or service centers.

Repairs can either be charged directly to a production center, or repair costs can be accumulated in the repair department and charged to the production centers as work is done by the repair department.

Some items of supplies are chargeable direct to customers' orders from stores requisitions. Some supplies, such as those for pickling, plating, etc., go to make up part of the cost of a process. Other supplies are charged to production centers and to other centers as part of their burden.

Indirect labor is charged to production centers and to other centers which indirect labor serves, in proportion to the service of each person or group of persons included in indirect labor.

General Manufacturing Burden

General manufacturing burden consists of manufacturing costs and expenses not allocated to departments or production centers. Principal items are salaries and expenses of the general superintendent's office, cost department, and planning and scheduling department. Total of general manufacturing burden will be distributed to production and other centers on some fair basis, such as total direct labor and burden or total number of employees.

It is usually most convenient to develop burden on the basis of annual total figures making up what is, in effect, an annual budget for burden. The totals as determined are then divided by the working hours expected, to give the burden rate per hour. Expected working hours may be average hours for the whole plant or they may be varied because of special conditions in individual production centers.

The estimated working hours used in determining the burden rate per hour are obviously of great importance in their effect on the rates to be used in estimating and in keeping costs. If 80 or 120 hours per week are used, the result will be low hourly rates. However, if you actually run only 50 hours per week, costs fail to absorb all of the actual expenses and there will be a resulting large loss from unabsorbed burden which may greatly exceed the estimated profits.

On the other hand, if burden is developed by using, for example, only 20 or 30 hours per week, the resulting high hourly rate may make your cost estimates so high that you will be unable to obtain any business. It is clear, therefore, that a fair measure of hours in the light of conditions that can be expected is one of the most important matters for all of us to consider at this time.

It is the function of a manufacturing business to convert materials into parts or products. Therefore, a manufacturing business should expect to make the same profit whether the raw materials are purchased or are supplied by the customers. Profits should be added as a percentage of the labor and burden costs rather than as a percentage of total costs. Further, profits should be calculated as a return on the invested capital.

As an illustration, if the invested capital is $1 million, a return of 15 per cent on such capital is $150,000. In order to earn $150,000 after income taxes, it is necessary to obtain a profit of, say, $300,000 before such taxes. If total sales of $3 million are assumed, of which the cost of labor and burden is $1,500,000, the $300,000 of profit before taxes represents 20 per cent of the labor and burden total of $1,500,000.

Therefore, to obtain 15 per cent on the invested capital, 20 per cent on profit should be added to the total cost of labor and burden. Keep in mind that material burden has already been included as part of the burden costs and therefore, with the foregoing plan it would make no difference in the relative profit on different orders whether the material used is steel, copper, brass or aluminum.

It is important to check estimates with actual results. This is done in two general ways: Accumulation of job order costs, and development of standard costs and variances.

Job Cost Card

The former method is illustrated by Fig. 2, which is a job cost card used by a leading stamper. Record of material used and of the various labor operations for each job is entered first on the back of the card and, when the order is completed, is totaled and carried forward to the face of the card. When the card is summarized, the actual cost is compared with the estimated cost.

This plan is good if the general run of orders received from customers is of an unusual nature. For repetitive business, however, or for the usual run of products, it is better to develop standard costs which can be used as estimates and checked with actual costs on an overall basis.

Standard costs are illustrated by the chart of accounting plan, Fig. 1, already referred to. Comparison between estimates or standards and actual costs is not made by job order, but by items, such as material, direct labor and burden. Each of these will be subdivided as necessary in order to give essential facts to the management.

The greatest advantage of the standard cost plan is that management has a comparison of actual costs with what the product *ought to cost*.

Comparison of actual with estimated costs is not only important for better estimating, but is the basis for most ef-

fective managerial control, as differences and variances are quickly brought to notice so that steps can be taken promptly to cure the trouble. This trouble may be in the control and handling of material, in planning and scheduling the work, in the failure of instruction or supervision, or may be the poor work of an individual operator.

The success of American industry in comparison with that of other countries has been due to the effective use of very large investment in plant and equipment in proportion to the number of employees. This condition results in a very heavy burden cost in relation to the cost of direct labor. The function of direct labor is often merely to keep the machine in operation. Accordingly, the study of burden and its application to cost is most important. Furthermore, the heavy cost of burden emphasizes the importance of keeping the machines producing all the time and justifies great care on the part of management to see that they do so operate.

Hot Dip Galvanizing

(*Concluded from Page* 140)

gested, rigidly held in place over an inner protecting tube of standard wrought iron or seamless steel pipe.

The thermocouple should be installed so that the tip of its lower leg is a few inches above the maximum dross line. This is important because zinc-dross is even more severe on the thermocouple protecting tube than pure molten zinc. Furthermore, if the thermocouple tip is below the dross line, the pyrometer will actually measure the temperature of the dross and not of the zinc itself, because the temperature measured by any thermocouple is the temperature of the material right at its tip or at the "hot junction."

The thermocouple should be protected from mechanical injury, by installing an ordinary steel channel over the full length of the thermocouple and extending into the bath. The channel should be bolted to the top of the pot in such a way that it may easily be removed, permitting periodic inspection of the thermocouple. It is also advisable to use a suitable insulating material under the upper leg of the thermocouple.

If a thermocouple is installed in the combustion chamber, it should be inserted through the furnace wall with its tip touching the hottest part of the pot. A chromium-iron alloy protecting tube preferably should be used. The thermocouple should be installed where it will not be subjected to direct flame impingement, as this shortens the life of the protecting tube considerably.

(*To be continued*)

The Business Trend

Production Shows First Decline in Two Months

THE FIRST decline in two months was registered by industrial production during the week ended Aug. 31 when automobile output was off markedly. First opportunity for a recovery is the week beginning Sept. 9, for production last week was held down by the Labor Day holiday, as figures will show when they become available.

The slump in the week ended Aug. 31 lowered STEEL's industrial production index to 147 per cent (preliminary), down 5 points from the postwar high mark of 152 per cent in the weeks ended Aug. 17 and 24.

AUTOS—The decline in automobile output in the week ended Aug. 31 came about when Chrysler Corp. shut its plants from Aug. 26 to Sept. 3 so that supplies of components could build up to a level that would permit uninterrupted operations of assembly lines. As a result of this closing, total production of passenger cars and trucks during the last week of August was only 73,305 units, compared with the previous week's 91,360, which had been a new postwar high.

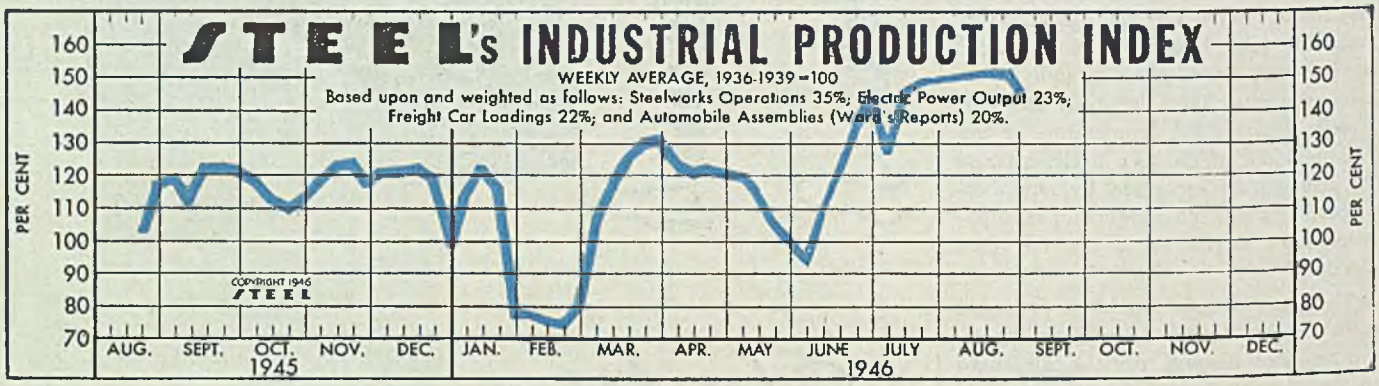
INDEX RISES—Reflecting the upward trend in industrial and business activity during the summer is the Federal Reserve Board's index which in July rose to 174 per cent, the highest level recorded since August, 1945, when it was 187 per cent of the 1935-1939 average of 100. The July figure was 3 points above that for June. Output of durable goods and minerals generally increased in July while production of nondurable manufactures as a group showed little change.

NEW BUSINESSES—Incorporations of new businesses dropped off slightly in June from the May level. In the 47 states reporting to Dun & Bradstreet Inc. the number of new incorporations was 11,335 (estimated), a loss of 644 or 5.4 per cent from the May figure of 11,979. Total incorporations in the first half of 1946 were 71,034, nearly double the 35,781 during the second half of 1945.

BUSINESS FAILURES—Meanwhile during the first half of 1946, business failures ran only a little more than 9 per cent above the total for the corresponding period of last year.

PRICES—Increased prices for a few nonagricultural commodities raised the U. S. Bureau of Labor Statistics index of wholesale prices 0.1 per cent during the week ended Aug. 24. At 128.4 per cent of the 1926 average, the index was 13.9 per cent higher than before the temporary suspension of government ceilings on prices, and 21.7 per cent higher than at the end of the war.

CONSTRUCTION — In the government program to channel as much material as possible into the building of homes for war veterans the Facilities Review Committee of the Civilian Production Administration in the week ended Aug. 22 denied 311 nonhousing construction applications with a value of $17,092,740. During the same period, the committee approved 19 applications for commercial, industrial and institutional construction with a value of $2,023,300.



The Index (see chart above): Latest Week (preliminary) 147 Previous Week 152 Month Ago 148

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Ouptut (per cent of capacity)‡	90	89	88.5	75
Electric Power Distributed (million kilowatt hours)	4,435†	4,444	4,351	4,137
Bituminous Coal Production (daily av.—1000 tons)	2,035	1,998	2,073	2,029
Petroleum Production (daily av.—1000 bbls.)	4,838†	4,836	4,881	4,875
Construction Volume (ENR—Unit $1,000,000)	$79.9	$97.0	$115.7	$35.3
Automobile and Truck Output (Ward's—number units)	73,305	91,360	79,385	13,845

*Dates on request. †Preliminary. ‡1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

TRADE

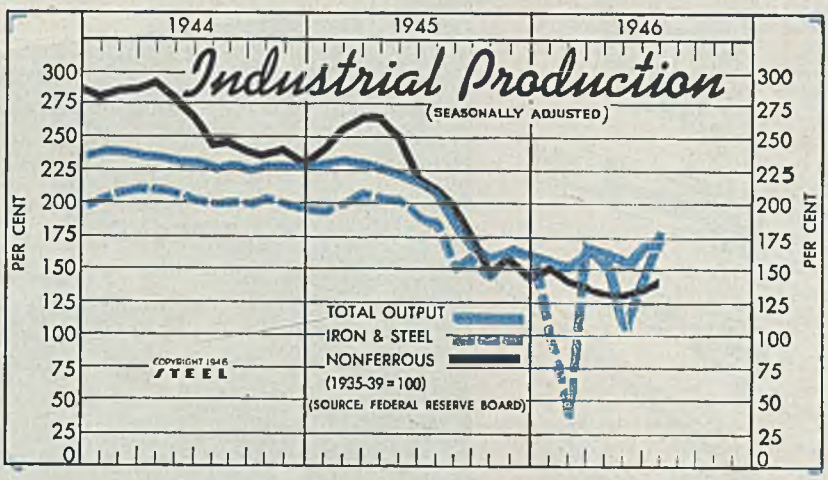
Freight Carloadings (unit—1000 cars)	884‡	885	898	860
Business Failures (Dun & Bradstreet, number)	16†	17	14	16
Money in Circulation (in millions of dollars)‡	$28,376	$28,365	$28,245	$27,600
Department Store Sales (change from like week a year ago)‡	+40%	+90%	+33%	+6%

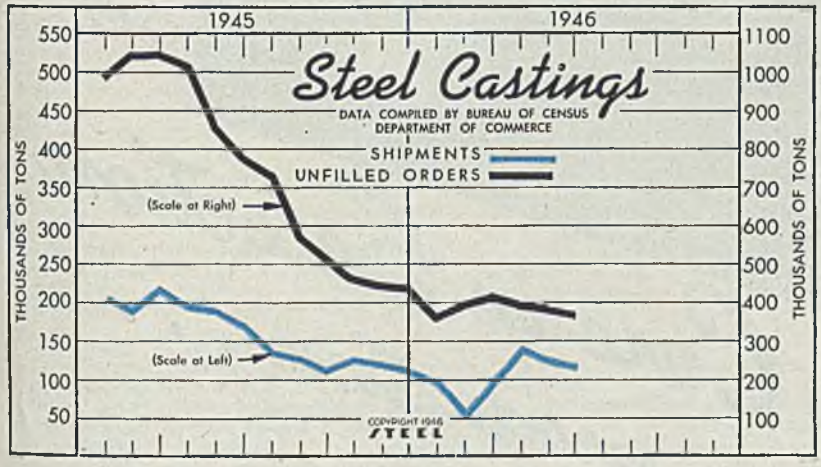
†Preliminary. ‡Federal Reserve Board.

Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1946	1945	1946	1945	1946	1945
Jan.	159	234	105	197	150	240
Feb.	153	236	43	202	141	257
Mar.	168	235	169	210	133	265
Apr.	165	231	159	206	132	264
May	159	226	109	204	130	251
June	171	220	154	192	135	219
July	174	211	179	187	141	210
Aug.	...	187	...	155	...	198
Sept.	...	171	...	163	...	176
Oct.	...	163	...	146	...	147
Nov.	...	168	...	167	...	159
Dec.	...	164	...	165	...	144
Avge.	...	204	...	183	...	211





Commercial Steel Castings

(Net tons in thousands)

	Shipments		Unfilled Orders*	
	1946	1945	1946	1945
Jan.	99.1	210.2	358.9	983.1
Feb.	57.4	191.4	390.1	1,045.4
Mar.	101.4	222 6	412.3	1,047.7
Apr.	146.3	197.7	392.8	1,018.9
May	129.2	192.9	381.7	852.9
June	123.6	173.7	361.3	776.3
July	....	139.3	....	728.4
Aug.	....	131.4	....	565.6
Sept.	....	114.6	....	513.8
Oct.	....	130.3	....	460.3
Nov.	....	123.0	....	443.8
Dec.	....	115.2	....	434.3

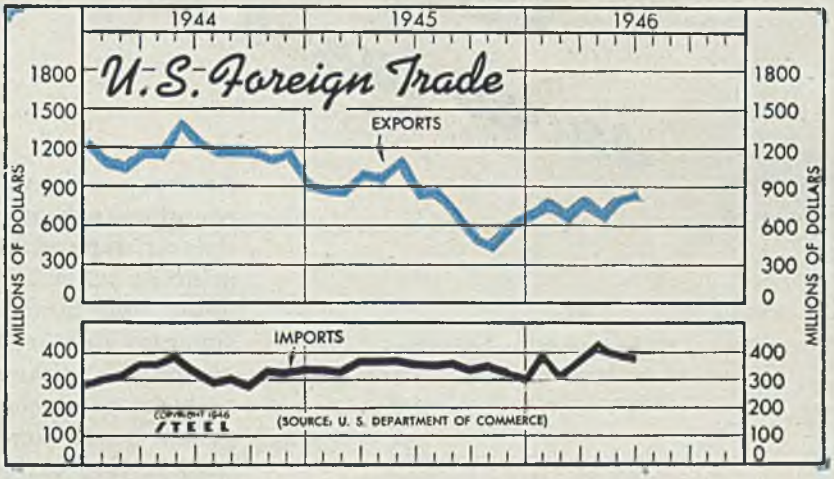
* Castings for sale.

Foreign Trade

Bureau of Foreign and Domestic Commerce

(Unit Value—$1,000,000)

	Exports			Imports		
	1946	1945	1944	1946	1945	1944
Jan.	800	901	1,124	398	334	300
Feb.	671	882	1,086	318	324	313
Mar.	815	1,030	1,197	384	365	359
Apr.	758	1,002	1,182	406	366	359
May	851	1,133	1,419	397	372	386
June	878	866	1,271	385	360	330
July	...	893	1,198	...	356	293
Aug.	...	737	1,207	...	360	302
Sept.	...	515	1,199	...	335	280
Oct.	...	455	1,140	...	344	327
Nov.	...	639	1,184	...	322	322
Dec.	...	736	934	...	297	336
Total	...	9,789	14,141	...	4,135	3,907



FINANCE

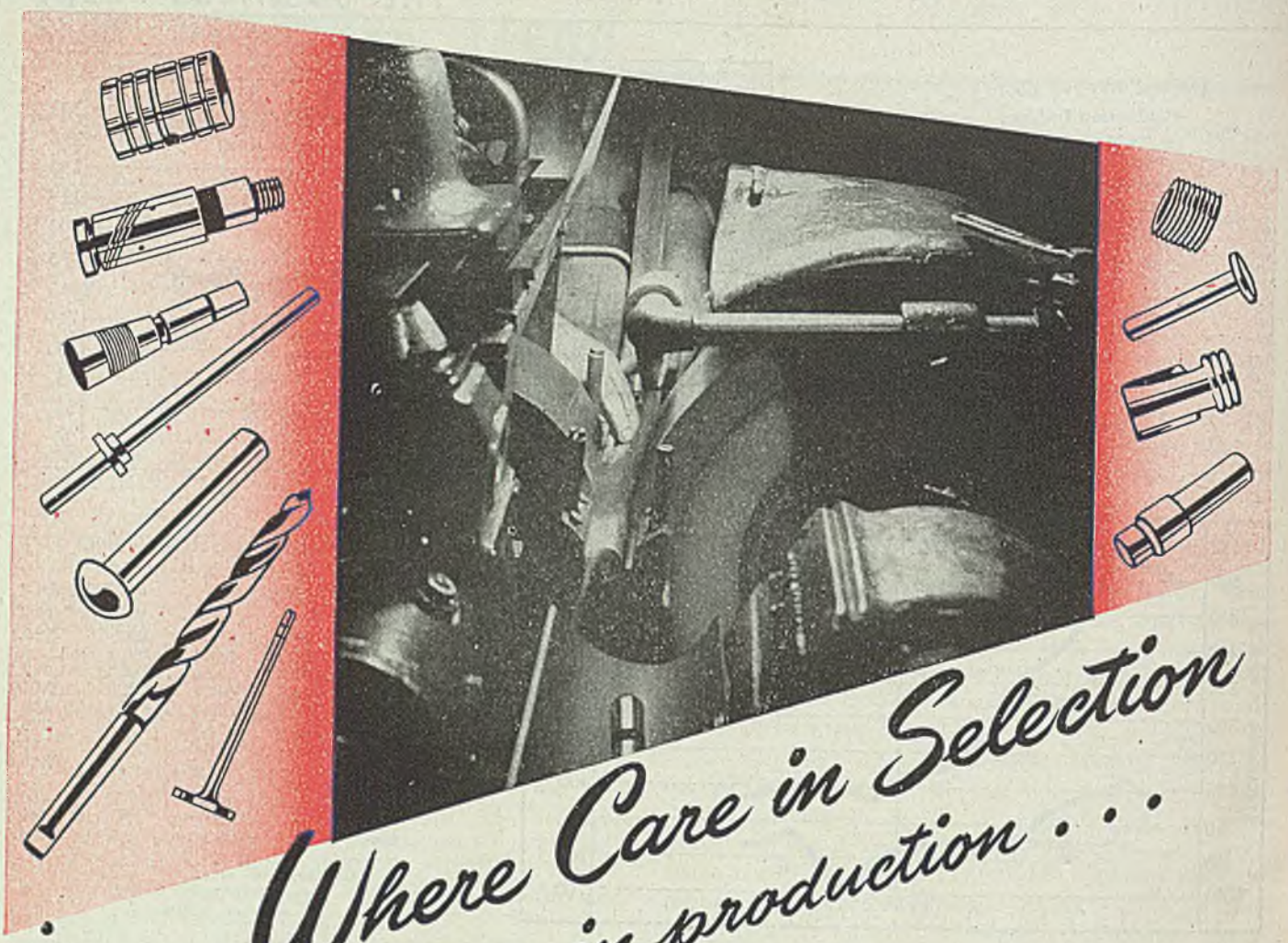
	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$11,074	$12,163	$11,730	$9,944
Federal Gross Debt (billions)	$267.8	$267.7	$268.6	$263.4
Bond Volume, NYSE (millions)	$20.7	$17.0	$18.4	$22.2
Stocks Sales, NYSE (thousands)	6,875	4,506	4,127	5,767
Loans and Investments (billions)†	$60.0	$59.9	$60.5	$62.7
United States Gov't. Obligations Held (millions)†	$41,571	$41,460	$42,666	$46,455

†Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$64.45	$64.45	$64.45	$58.27
All Commodities†	128.4	128.3	124.1	105.5
Industrial Raw Materials†	144.9	146.3	140.2	116.9
Manufactured Products†	123.6	122.9	119.3	102.1

†Bureau of Labor Statistics Index, 1926=100.



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Accuracy of finish in centerless grinding, maximum rounding action and quick, safe removal of surface defects depend largely on your selection of the right grinding wheel. Get off to the right start by selecting yours from Simonds Abrasive Company's line of precision manufactured grinding wheels. From a wide range of Borolon* (aluminum oxide) and Electrolon* (silicon carbide) products you can select wheels of the correct grain, grade and width of face to give fast cutting, long lasting action on through feed and infeed operations on every machine part and shape from forgings to valve tappets. Simonds Abrasive #1 bond Borolon Wheels are especially recommended. Balanced to close limits they break down at the right rate to permit superior finish and accuracy on centerless grinding production.

You will find the Simonds Abrasive distributor in your vicinity helpful in recommending the right wheels for your specific jobs. In addition the Simonds Abrasive Data Book is available to guide your selection. Write for your copy today.

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HELPFUL LITERATURE

1. Insurance Data

Employers Mutuals of Wausau—"Dictionary of Insurance Terms" provides clear, concise explanation of insurance terms without legal phraseology. Examples demonstrate application of terms to specific cases. Information is presented to aid in purchasing proper type of insurance for coverage desired.

2. Presses

Warren City Mfg. Co.—4-page illustrated bulletin "Warco Presses" gives brief data on line of welded steel presses which includes open back inclinable, two-point eccentric gear and straight side hydraulic presses, as well as mechanical press brakes.

3. Brush Backed Sander Head

Vonnegut Moulder Corp.—8-page illustrated bulletin No. 52 is instruction guide for loading, setting up and operating the new 32-brush sander head which provides flexible means for wide range of finishing and polishing operations. Abrasive strips are fed from magazine between brush segments which are in form of wheel.

4. Hydraulic Pumps & Controls

Vickers Inc.—16-page illustrated bulletin No. 42-26 presents design and application data on Hydromotive oil hydraulic pumps and controls for practically any hydraulic power or control function. Application and engineering data are given for each type of unit.

5. Carbon-Graphite Parts

United States Graphite Co.—40-page illustrated bulletin on Graphitar describes wide range of carbon-graphite products which resist chemical attack, have low coefficient of friction and self-lubricating properties. Piston rings, bearings, seals, molds, wear plates, furnace linings and many other parts are shown.

6. Wire Rope Data

Union Wire Rope Corp.—12-page illustrated data file is entitled "Rope Dope Educational Bulletins." Additional bulletins will be issued. Quick reference data are presented on replacement of wire rope, lays of wire rope, factors of rope life, installation procedures, working load calculation and common abuses of wire rope.

7. Clamshell Bucket

C. S. Johnson Co.—8-page illustrated bulletin "Johnson All-Welded Clamshell Bucket" explains features of this line which includes general purpose, wide rehandling and heavy duty digging types which are available in capacities of ⅝ to 2½ cubic yards.

8. Welding Press

Martin Electric Co.—6-page illustrated folder "Pacing the Modern Assembly Line" shows how the new Martin welding press speeds spot welding operations. Features of this equipment include multiple welding transformers to provide equalized current, interchangeable welding dies, instantaneous welding action and fast production cycle.

9. Radiant Tube Heating

Surface Combustion Corp.—4-page illustrated bulletin No. SCO128 discusses application of radiant tube heating method to carburizing, carbon restoration, hardening, annealing and other processes in which prepared atmospheres are used to produce clean or bright work. Schematic view of radiant tube is shown.

10. Manufacturing Facilities

Jarecki Machine & Tool Co.—32-page illustrated bulletin gives full information on facilities of this company for engineering and production of dies, jigs and fixtures, stampings and large or small assemblies of stampings or machined parts. Typical work produced, tool and die shop facilities, stamping equipment and engineering department are described.

11. Electric Hoists

Lisbon Hoist & Crane Co.—8-page illustrated bulletin describes Bob-Cat line of electric hoists which are available in 1, 1½ and 2-ton capacities. Sectionalized pictures show features of these units which are light in weight, compact and accessible for maintenance.

12. Toggle Clamps

Knu-Vise, Inc.—16-page illustrated condensed catalog 48 is compilation of information on available models of toggle action clamps, pliers and wrenches produced by company. These clamping devices facilitate drilling, fabricating, assembly, welding and wide range of other production or shop operations.

13. Angle Bending Rolls

Thomas Machine Mfg. Co.—4-page illustrated bulletin No. 127 describes and gives specifications of horizontal and vertical bending rolls for bending angles, tees, flats, rounds, squares, pipe, beams, channels and special shapes.

14. Machine Tools

Kearney & Trecker Corp.—48-page illustrated catalog No. E-53 presents complete data on line of machine tools which includes plain, universal and sliding head milling machines; production type milling machines; Autometric jig boring units; combination milling and boring machines; cutter grinders and wide range of attachments for these precision machine tools.

15. Aluminum Powders & Pastes

Reynolds Metals Co.—20-page illustrated bulletin No. 21A describes forms and applications of aluminum pastes and powders. Characteristics, data on vehicles for carrying and technical information on use are included.

16. Weldments

Lukenweld, Inc.—28-page illustrated bulletin "Weldments Designed and Fabricated by Lukenweld" outlines facilities of company for designing and fabricating medium and heavy weldments. Typical products welded include engine frames, elevator cages, girder beams, melting pots, gear blanks and other similar large units. Machining, finishing and testing departments are described also.

17. Boiler Tubes

Joseph T. Ryerson & Son, Inc.—8-page illustrated circular on Babcock & Wilcox electric-resistance-welded boiler tubes shows scenes in manufacture and testing of tubes. Advantages are discussed, stock sizes listed and specifications given.

18. Plating Bath Blanket

Udylite Corp.—Illustrated folder "Don't Waste Heat, Power, Chromic Acid" discusses advantages of use of Chrome-Lock acid resistant plastic tubes to blanket surface of chrome plating bath to reduce formation of chromic acid spray.

19. Earthmoving Equipment

Caterpillar Tractor Co.—Illustrated folding broadside reveals capabilities of model No. 8A and model No. 7A bulldozers. Balance, visibility, ease and speed of angling and tilting are discussed. Design features are listed and equipment is pictured in actual operation.

20. Hard Facing Alloys

Wall Colmonoy Corp.—7-page loose-leaf data file presents information on Colmonoy tips for centers and centerless grinder blades. Methods of applying tips to centers and to blades are outlined. Prices and sizes are listed.

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21. Air Tools

Rotor Tool Co.—44-page illustrated booklet No. 30 explains how savings can be effected in straight wheel, cone, cup wheel and small wheel grinding; sanding; buffing; wire brushing; drilling; reaming; screw driving and nut setting. Features of line of air tools are shown in detail.

22. Steel Die Sets

Standard Machinery Co.—16-page illustrated catalog section DS presents specifications and prices of interchangeable steel die sets, guide pins, guide pin bushings and punch shanks. Feeds, scrap cutters, straighteners, presses and accessories are shown.

23. Grinding Wheels

Simonds Abrasive Co.—128-page illustrated booklet "Grinding Wheel Data Book" gives information on grinding wheels and grinding practices. Wheel selection table covers many recommended specifications for grinding large variety of materials.

24. Rubber Development

B. F. Goodrich Co.—22-page illustrated bulletin "Typical Examples" presents reproductions of outstanding advertisements of Industrial Products Sales Division. Advertisements serve to indicate developments in rubber and plastic product fields and how individual problems were solved.

25. Case & Keg Truck

Rapids-Standard Co. — 6-page illustrated folder form No. 46-WE contains complete specifications, typical uses and order blank for Wheel-Ezy case and keg truck. Trucks are available with either one or two handles and with solid plate or open nose.

26. Alloy Steel

Vanadium Corp. of America—4-page illustrated bulletin is reprint of technical article entitled "Chrome-Vanadium Carburizing Steel '6120'" and discusses changes in composition which increase hardenability. Alloy permits increase in section where it can be applied.

27. Powder Metal Parts

Amplex Div., Chrysler Corp.—168-page illustrated catalog and 16-page supplemental die list No. 4 present complete data on Oilite self-lubricating bearings and machine parts. How Oilite parts are produced from metal powders is explained in detail. Engineering section covers specifications, design features, design practice, shaft clearances, load rating charts, sizing methods, tolerances, chamfer practice, machining and lubrication. Bearing dimensions are listed.

28. Permanent Mold Metal

Meehanite Metal Corp.—4-page illustrated bulletin No. 23 is entitled "Meehanite—the Metal for Permanent Molds." This metal is described in permanent mold applications in production of metals, glass, plastics and rubber. Its characteristics are outlined.

29. Rotary Pumps

Geo. D. Roper Corp.—4-page illustrated bulletin No. 10 describes series K rotary pumps for diesel fuel oil transfer work, pressure lubricating jobs, hydraulic service, fuel supply duty, and many similar applications pumping clean liquids. Pumps are available in ¾, 1½ and 3-gallon per minute sizes.

30. Openside Planer

Rockford Machine Tool Co.—14-page illustrated booklet No. 450 on Hy-Draulic openside planer built in four capacities and six lengths discusses advantages of hydraulic drive to table and hydraulic feeds. Features of design and construction are depicted and discussed in detail.

31. Building Maintenance

Flexrock Co.—64-page illustrated reference book on building maintenance materials gives specifications and application data on floor patching and resurfacing materials; roofing compounds; waterproofing materials for walls, floors, etc. and wall leak-stopper. Information on finishing, coloring, waxing, cleaning and preserving floors aids in general maintenance.

32. Industrial Wire Cloth

Reynolds Wire Co.—32-page illustrated catalog and data book presents complete information on line of steel, copper, nickel, aluminum, stainless steel, bronze, phosphor bronze and Monel wire cloths for industrial purposes. Tables to aid in calculation of needs and weight and mesh tables are included.

33. Resinous Cement

Nukem Products Corp.—6-page illustrated folder entitled "Nukem All-Purpose Acid-Alkali Proof Resinous Cement" describes material, shows typical applications and contains resistivity chart which lists materials to which cement is resistant. Engineering service available is outlined.

34. Aluminum Alloys

National Smelting Co.—13-page illustrated fileable bulletin presents data on series of Ternalloy aluminum alloys possessing exceptionally high elastic properties. These aluminum-magnesium-zinc alloys are described with complete specifications, characteristics, advantages of use and compositions.

35. Screening Equipment

Robins Conveyors Inc.—12-page illustrated bulletin No. 111-A describes Eliptex screen which employs elliptical motion with three components. These are horizontal, which moves materials across deck quickly; vertical, which separates material into sizes and elliptical, which gives sharpest possible sizing.

36. Resinoid Grinding Wheel

Norton Co.—6-page illustrated folder describes B-5 resinoid wheels for foundry grinding. Rapid, smooth cutting action and long life are characteristics. Tables are included to aid in selection of proper wheels for various classes of work on swing frame grinders, floor stands and portable grinders.

37. Dies & Wear Resistant Parts

Metal Carbides Corp.—36-page illustrated catalog No. 46-WP presents complete data and prices on Talide tipped centerless grinder blades, wire and tube dies, sheet metal dies, extrusion and shape dies, bushings, gages, centers, bar stock and other parts. Engineering information is included.

38. Roller Bearings

McGill Mfg. Co.—16-page illustrated bulletin entitled "McGill 'Solidend' Multirol Bearings" presents design and construction features and recommended applications for this type antifriction bearing. Engineering data including size combination and dimension table and lubrication holes, fillet radii and load capacity tables are included.

39. X-ray Spectrometer

North American Philips Co.—8-page illustrated booklet No. R1041 covers history, development and uses for Geiger-Mueller X-ray Spectrometer. Practical applications, specimen preparation and methods of identification are subjects treated at length.

40. Grinding Machine

Cincinnati Grinders Inc.—12-page illustrated bulletin No. G-520 presents complete specifications on model OH 4-inch plain hydraulic grinding machine which is designed for precision center-type grinding operations on small work. Machine has high productive capacity for either small or large quantities of traverse or infeed work.

41. Composite Tool Steel

Jessop Steel Co.—12-page illustrated bulletin "Jessop Type R Composite Tool Steel" gives properties and applications of this material which combines hardness and edge-holding properties of high alloy steel with toughness and machinability of low alloy steel.

42. Die Heads

Landis Machine Co.—16-page illustrated bulletin No. F-90 presents specifications and engineering data on line of heat treated die heads. Lanco heads for bolt threading machines, Landmatic heads for turret lathes and Lanex heads for automatic screw machines are described. Complete dimensional data are given.

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Scrap Shortage and Holiday Forces Cut in Steel Output

Lack of raw materials forces some open hearths to close for the first time in nearly 25 years. . . Priorities complicate distribution problem

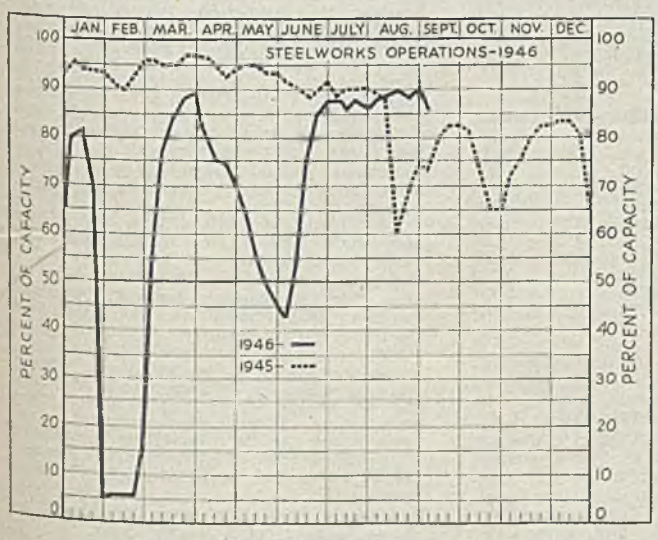
SEVERAL factors combined last week to further complicate production and distribution of steel. Both producers and consumers were uncertain as to what the future may hold in store for them.

Effect of the holiday on operations was intensified by the closing of many open hearths due to lack of scrap or as a means of conserving raw materials. Some open hearths closed down for the first time in nearly 25 years, because of a lack of scrap, and many are operating on a day-to-day basis and are rapidly consuming their meager reserves.

While some movements have been organized to resume the wartime collection of scrap, many observers believe that only higher prices, which may be authorized by the Office of Price Administration soon, offers the only solution to the scrap bottleneck. Although there may be a further dip in steel production before there is definite improvement, a general turn for the better may develop shortly. Pig iron output is gaining and the increasing output of manufactured goods should stimulate the flow of scrap.

Nevertheless, a far heavier demand for these raw materials than there is available supply will remain for some time and there will continue to be complications in the matter of supplies of coke and freight cars. As badly as pig iron is needed at this time, it is being stocked at certain producing centers because of inability to get cars.

Meanwhile, steel producers are having their difficulties in appraising the volume of preference tonnage they will be called upon to roll during the remainder of the year.



DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended Sept. 7	Change	Same Week 1945	Same Week 1944
Pittsburgh	98	+ 1.5	65.5	89
Chicago	74.5	—17.5	72	99.5
Eastern Pa.	80	— 3	72	95
Youngstown	89	None	72	90
Wheeling	81.5	— 7.5	95	97
Cleveland	88	— 2	78.5	92
Buffalo	90.5	None	72	88.5
Birmingham	99	+ 6	95	95
New England	84	— 2	80	85
Cincinnati	83	— 1	82	87
St. Louis	63	+ 8.5	65	87
Detroit	91	None	89	89
Estimated national rate	85.5	— 4.5	73.5	96

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

One complication is the number of rated orders being received from other than their regular customers. This is being ascribed in part to the fact that, while consumers are supposed to first contact their usual supplier, some apparently are approaching others as they know that regular sources will apply rated tonnages against orders they may already have on schedule for them.

Underlying many of the difficulties are the increasing number of regulations designed to speed the housing program, with no little speculation as to the effective administration of priorities generally, as the task of these housing regulations has been switched over from CPA to the National Housing Agency. CPA has informed the industry that priorities assistance on steel during the fourth quarter will be confined mainly to a restricted list of critical items required for the housing program and a few other urgent needs, possibly car and farm implement steel. Heaviest demands will be in lighter gage sheets, particularly galvanized.

Added emphasis on housing needs is being reflected in declining demand for steel for other types of construction. A number of projects, which until recently showed signs of going ahead, have been delayed and inquiries generally for nonhousing work are lighter.

Steelmaking operations dropped 4½ points last week to 85.5 per cent of capacity, the lowest level since June. Reduction in operations were attributed partly to closings for the Labor Day holiday but mainly to the lack of scrap. The following declines were recorded: 17½ points to 74½ per cent at Chicago; 7½ to 81½ at Wheeling, 3 to 80 in eastern Pennsylvania, 2 to 88 at Cleveland, 2 to 84 in New England, and 1 to 83 at Cincinnati. Advances of 1½ points to 98 per cent and of 8½ to 63 per cent were made at Pittsburgh and St. Louis, respectively. The Birmingham rate rose 6 points to 99 per cent. Rates held unchanged at Youngstown, Buffalo, and Detroit.

Composite steel prices held unchanged.

COMPOSITE MARKET AVERAGES

	Sept. 7	Aug. 31	Aug. 24	One Month Ago Aug., 1946	Three Months Ago June, 1946	One Year Ago Sept., 1945	Five Years Ago Sept., 1941
Finished Steel	$64.45	$64.45	$64.45	$64.45	$64.09	$58.27	$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	27.50	27.50	27.50	27.50	27.50	24.00	23.00
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	Sept. 7, 1946	Aug., 1946	June, 1946	Sept., 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.86	2.86	2.82	2.57
Steel bars, Chicago	2.50	2.50	2.50	2.25
Shapes, Pittsburgh	2.35	2.35	2.35	2.10
Shapes, Philadelphia	2.48	2.48	2.465	2.215
Shapes, Chicago	2.35	2.35	2.35	2.10
Plates, Pittsburgh	2.50	2.50	2.50	2.25
Plates, Philadelphia	2.558	2.558	2.55	2.30
Plates, Chicago	2.50	2.50	2.50	2.25
Sheets, hot rolled, Pittsburgh	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	4.05	4.05	3.70
Sheets, hot-rolled, Gary	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Gary	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Gary	4.05	4.05	4.05	3.70
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh	3.05	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh	3.75	3.55	3.25	2.90
Tin plate, per base box, Pittsburgh	$5.25	$5.25	$5.25	$5.00

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$38.00	$38.00	$38.00	$36.00
Slabs, Pittsburgh, Chicago	39.00	39.00	39.00	36.00
Rerolling billets, Pittsburgh	39.00	39.00	39.00	36.00
Wire rods, No. 5 to ⅜-inch, Pitts.	2.30c	2.30c	2.30c	2.15c

* $2 higher on bessemer, basic, foundry and malleable on adjustable pricing contracts.

Pig Iron

	Sept. 7, 1946	Aug., 1946	*June, 1946	Sept., 1945
Bessemer del. Pittsburgh	$29.77	$29.77	$27.69	$26.19
Basic, Valley	28.00	28.00	26.00	24.50
Basic, eastern del. Philadelphia	29.93	29.93	27.84	26.34
No. 2 fdry., del. Pgh. N. & S. sides	29.27	29.27	27.19	25.69
No. 2 foundry, Chicago	28.50	28.50	26.50	25.00
Southern No. 2, Birmingham	24.88	24.88	22.88	21.38
Southern No. 2, del. Cincinnati	28.94	28.94	26.94	25.44
No. 2 fdry., del. Philadelphia	30.43	30.43	28.34	26.84
Malleable, Valley	28.50	28.50	26.50	25.00
Malleable, Chicago	28.50	28.50	26.50	25.00
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.00	33.00
Gray forge, del. Pittsburgh	28.69	28.69	26.69	25.19
Ferromanganese, fob cars, Pittsburgh	140.00	140.00	140.00	140.38

Scrap

Heavy melting steel, No. 1, Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt, steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke

Connellsville, furnace ovens	$8.75	$8.75	$8.75	$7.50
Connellsville, foundry ovens	9.50	9.50	9.50	8.25
Chicago, by-product fdry., del.	15.10	15.10	13.75	13.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

Semifinished Steel

Carbon Steel Ingots: Fob mill base, rerolling quality, standard analysis, $33.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrop, $48.69.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41; Duluth (billets), $41; Pac. ports (billets), $51. (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Granite City Steel Co., $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., $58.64, Pas. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49; Duluth, billets, $49; forging billets fob Pac. ports, $59.

(Andrews Steel Co. may quote carbon forging billets $5C gross ton at established basing points; Follansbee Steel Corp., $49.50 fob Toronto, O.; Geneva Steel Co., $64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $58.43; del. Detroit $60.43; eastern Mich. $61.43.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—⅜ in. inclusive, per 100 lb, $2.30. Do., over ⅜—$\frac{47}{64}$-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.50.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.60c; eastern Mich., 2.65c; New York, del., 2.86c; Phila., del., 2.86c; Gulf ports, dock, 2.85c; Pac., ports, dock, 3.15c. (Sheffield Steel Corp. may quote 2.75c. fob St. Louis; Joslyn Mfg. & Supply Co., 2.55c, fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon cars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.021c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.108	4300	$1.839
2300	1.839	4600	1.298
2500	2.759	4800	2.326
3000	0 541	5100	0.379
3100	0.920	5130 or 5152	0.494
3200	1.461	6120 or 6152	1.028
		6145 or 6150	1.298
3400	3.462	8612	0.703
4000	0.487	8720	0.757
4100 (.15-.25 Mo)	0 757	9830	1.407
(.20-.30 Mo)	0.812		

* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.725c, eastern Mich.; 3.755c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, del., 2.50c; Gulf ports, dock, 2.70c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.525c; eastern Mich., del., 2.575c; Phila., del., 2.615c; New York, del., 2.685s; Pacific ports, 2.975c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 3.00c on hot carbon sheets, Sparrows Point, Md.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., del., 3.425c; New York, del., 3.615c; Phila., del., 3.635c; pacific ports, 3.925c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.60c.

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.60c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

Aluminized Sheets, 20 gage: Pittsburgh, hot-dipped, coils or cut to lengths, 9.00c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c
Transformer			
72	6.625c	7.375c	.....
65	7.625c	8.375c	.....
58	8.125c	8.875c	.....
52	8.925c	9.675c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.55c; eastern Mich., del., 2.60c; Pacific ports, 3.10c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.45c; eastern Mich., del., 2.50c; Pacific ports, 3.00c. (Superior Steel Corp. may quote 3.20c, Pitts.)

Cold-Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., del., 3.20c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

Cold-Finished Spring Steel: Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

Tin, Terne Plate

(OPA ceiling prices announced March 1, 1946.)

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb base box, 0.25 lb tin, $4.60; 0.50 lb tin, $4.75; 0.75 lb tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.30c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point, $4.65.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb $12.50; 15-lb $14.50; 20-lb $15.50 (nom.); 40-lb $20.00 (nom.).

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, 2.74c; Boston, del., 2.86c; Pacific ports, 3.05c; Gulf ports, 2.85c.

(Granite City Steel Co. may quote carbon plates 2.65c fob DPC mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.60c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.273c; Pacific ports, 4.49c.

Clad Steel Plates: Coatesville, 10% cladding: nickel-clad, 18.72c; inconel-clad, 26.00c; monel-clad, 24.96c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.60c, Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.20c.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

Wire to Manufacturers in carloads

Bright basic or bessemer	*$3.05
Spring (except Birmingham)	*$4.00

Wire Products to Trade

Nails and staples

Standard and cement-coated	†$3.75
Galvanized	‡$3.40

Wire, Merchant Quality

Annealed	§$3.50
Galvanized	§$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 15½ gage and heavier	72
Barbed wire, 80-rod spool	**79
Barbless wire, twisted	**79
Fence posts	74
Bale ties, single loop	72½

*Add $0.10 for Worcester, $0.05 for Duluth and $0.50 for Pacific ports.

†Add $0.30 for Worcester, $0.50 for Pacific ports. Nichols Wire & Steel may quote $4.25; Pittsburgh Steel Co., $4.10.

‡Add $0.50 for Pacific ports.

§Add $0.10 for Worcester; $0.70 Pacific ports.

**Pittsburgh Steel Co. may quote 89.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Welded

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	53	30	½	21	0½
¼ & ⅜	56	37½	¾	27	7
½	60¼	48	1-1¼	31	13
¾	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	58	46½	1¼	20	0½
2½-3	61	49½	1½	25½	7
3½-6	63	51½	2	27½	9
7-8	62	49½	2½-3½	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

O.D. sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Elec. Weld— Hot Rolled	Cold Rolled
1"	13	....	$9.90	$9.36	$9.65
1¼"	13	....	11.73	9 63	11.43
1½"	13	$10.91	12.96	10.63	12.64
1¾"	13	12.41	14.75	12.10	14.37
2"	13	13.90	16.52	13.53	16.19
2¼"	13	15.50	18.42	15 06	18.03
2½"	12	17.07	20.28	16.57	19 83
2¾"	12	18.70	22.21	18.11	21.68
2¾"	12	19.82	23.54	19.17	22.95
3"	12	20 79	24.71	20.05	24.02
3½"	11	26.24	31.18	25.30	30.29
4"	10	32.56	38.68	31.32	37.52
4½"	9	43.16	51.29	....	....
5"	9	49.96	59 36	....	....
6"	7	76.71	91.14	....	....

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

Pipe, Cast Iron: Class B. 6-in. and over, $60 per net ton, Birmingham; $65, Burlington, N. J.; $62.80, del., Chicago; 4-in. pipe, $5 higher. Class A pipe, $3 a ton over class B.

Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton, $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, $31-$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates $51 net ton, base. Standard spikes, 3.65c.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Ceiling prices advanced 12 per cent, effective July 27, 1946: discounts remain unchanged.)

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅞ and ⅞ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hex	U.S.S.	S.A.E.
⅞-in. and smaller		64
¼-in. and smaller	62	..
⅛-in.-1-in.		60
⅞-in.-1-in.	59	..
1⅛-in.-1½-in.	57	58
1⅝-in. and larger	56	..

Additional discount of 10 for full kegs.

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset 1-in. and smaller	71 off
Headless, ¼-in. and larger	60 off
No. 10 and smaller	70 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural	4.75c
⅞-inch and under	*65-5 off

*Plus 12 per cent increase on base prices, effective July 26.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $2.75-$3.00 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr.	V.	Mo.	Base, per lb.
18.00	4	1	...	72.49c
1.5	4	1	8.5	58.43c
.....	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

Stainless Steels

Base, Cents per lb

	Bars	Plates	Sheets	H.R. Strip	C.R. Strip
CHROMIUM NICKEL STEELS					
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29 21	35.71
304	27.05	31.38	38.95	25 45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40 03	50.85
310	53.02	56.26	57.35	52.74	60.59
312	38.95	43.28	53.02	....	....
*316	43.28	47.61	51.94	43.28	51.94
§321	31.38	36.79	44.36	31 65	41.12
†347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35
STRAIGHT CHROMIUM STEEL					
403	23.93	26.51	31.92	22.99	29.21
**410	20.02	23.93	28.67	18 39	23.80
416	20.56	23.80	29.21	19.75	25.45
††420	25.96	30.84	36.25	25 70	39.49
430	20.56	23.80	31.38	18.94	24.35
‡‡430F	21.10	24.35	31.92	20 29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25 96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.49	37 87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48
STAINLESS CLAD STEEL (20%) (Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)					
304	.....	19.48	20.56	.....	.....
410	.....	17.31	18.39	.....	.....
430	.....	17.85	18.94	.....	.....
446	.....	19.48	20.56	.....	.....

* With 2-3% molybdenum. § With titanium. † With columbium. ** Plus machining agent. †† High carbon. ‡‡ Free machining.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	*$8.75
Connellsville, foundry	9.25- 9.75
New River, foundry	10.25-10.50
Wise county, foundry	9.00- 9.50
Wise county, furnace	8.50- 9.00
By-Product Foundry	
Kearney, N. J., ovens	14.40
Chicago, outside delivered	14.35
Chicago, delivered	15.10
Terre Haute, delivered	14.85
Milwaukee, ovens	15.10
New England, delivered	16.00
St. Louis, delivered	†15.10
Birmingham, delivered	12.25
Indianapolis, delivered	14.85
Cincinnati, delivered	14.60
Cleveland, delivered	14.55
Buffalo delivered	14.75
Detroit, delivered	15.10
Philadelphia, delivered	14.63

* Operators of hand-drawn ovens using trucked coal may charge $9.35; retroactive to May 17, 1946, on adjustable pricing.

† 15.68 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal, freight allowed east of Omaha.

Pure and 90% benzol	15.00c
Toluol, two degree	22.00c
Industrial xylol	22.00c
Per pound fob works	
Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c
Eastern plants, per pound	
Naphthalene flakes, balls, bbl, to jobbers, "household use"	9.00c
Per ton, bulk, fob plants	
Sulphate of ammonia	$30.00

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip (12-gage and heavier, wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold-finished bars	Cold-rolled strip
Boston	4.356[1]	4.208[1]	4.208[1]	6.039[1]	4.050[1]	5.548[1]	4.418[1]	5.725[14]	5.031[14]	4.656[21]	4.965
New York	4.134[1]	4.038[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.838[14]	4.584[21]	5.075
Jersey City	4.155[1]	4.018[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.890[14]	4.605[21]	5.075
Philadelphia	4.114[1]	3.937[1]	3.875[1]	5.564[1]	3.774[1]	4.664[1]	4.554[1]	5.499[16]	5.139[26]	4.564[21]	5.064
Baltimore	4.093[1]	4.05[1]	3.865[1]	5.543[1]	3.64[1]	4.293[1]	4.193[1]	5.365[17]	5.118[26]	4.543[21]	.....
Washington	4.232[1]	4.22[1]	4.067[1]	5.632[1]	3.842[1]	4.432[1]	4.332[1]	5.667[17]	5.007[24]	4.532[21]	.....
Norfolk, Va.	4.377[1]	4.303[1]	4.262[1]	5.777[1]	4.037[1]	4.927[1]	4.477[1]	5.862[17]	4.552[24]	4.677[21]	.....
Bethlehem, Pa.[o]	..	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.[o]	..	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.[o]	..	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60[1]	3.65[1]	3.92[1]	5.55[1]	3.575[1]	4.21[1]	4.11[1]	5.20[13]	4.625[16]	4.20[21]	4.96
Buffalo (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[13]	4.525[16]	4.10[21]	4.60
Pittsburgh (city)	3.60[1]	3.65[1]	3.65[1]	5.25[1]	3.575[1]	3.35[1]	3.850[1]	5.327[13]	4.625[24]	4.20[21]	4.70
Pittsburgh (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[13]	4.525[24]	4.10[21]	4.60
Cleveland (city)	3.60[1]	3.88[1]	3.65[1]	5.48[1]	3.575[1]	3.95[1]	3.850[1]	5.347[13]	4.625[24]	4.20[21]	4.70
Cleveland (country)	3.50[1]	.....	3.55[1]	.....	3.475[1]	3.85[1]	3.750[1]	.....	4.525[24]	4.10[21]	4.60
Detroit	3.70[1]	3.952[1]	3.90[1]	5.572[1]	3.675[1]	4.050[1]	3.950[1]	5.491[15]	4.725[24]	4.25[13]	4.95
Omaha (city, del.)	4.32[1]	4.37[1]	4.37[1]	5.97[1]	4.045[1]	4.52[1]	4.42[1]	6.00[13]	5.72[24]	4.945[21]	.....
Omaha (country)	4.22[1]	4.27[1]	4.27[1]	5.87[1]	3.945[1]	4.42[1]	4.32[1]	5.90[13]	.....	.....	.....
Cincinnati	3.902[1]	3.983[1]	3.952[1]	5.583[1]	3.671[1]	4.046[1]	3.946[1]	5.296[13]	4.271[24]	4.602[21]	.....
Youngstown[o]	.....	.....	.....	.....	.....	.....	.....	4.85[13]	.....	.....	.....
Middletown, O.[o]	.....	.....	.....	.....	3.475[3]	3.35[1]	3.750[1]	5.10[16]	.....	.....	.....
Chicago (city)	3.75[1]	3.80[1]	3.80[1]	5.40[1]	3.475[1]	3.95[1]	3.850[1]	†5.40[15]	4.425[24]	4.20[21]	4.90
Milwaukee	3.908[1]	3.958[1]	3.958[1]	5.558[1]	3.633[1]	4.108[1]	4.008[1]	†5.558[13]	4.583[24]	4.358[21]	5.058
Indianapolis	3.83[1]	3.88[1]	3.88[1]	5.48[1]	3.743[1]	4.118[1]	4.018[1]	5.368[13]	4.793[24]	4.43[21]	5.030
St. Paul	4.092[2]	4.142[2]	4.142[2]	5.742[2]	3.817[2]	4.292[2]	4.192[2]	5.666[13]	4.767[24]	4.852[21]	5.393
St. Louis	3.918[1]	3.968[1]	3.968[1]	5.568[1]	3.643[1]	4.118[1]	4.018[1]	5.622[13]	4.593[24]	4.522[21]	5.222
Memphis, Tenn.	4.298[1]	4.346[1]	4.346[1]	6.071[1]	4.221[1]	4.596[1]	4.496[1]	5.746[13]	.....	4.821[21]	.....
Birmingham	3.75[1]	3.80[1]	3.80[1]	6.153[1]	3.675[1]	4.05[1]	4.05[1]	5.20[13]	5.077[24]	4.99[21]	5.465
New Orleans (city)	4.358[1]	4.408[1]	4.408[1]	6.329[1]	4.283[1]	4.658[1]	.....	5.808[13]	5.304[24]	5.079[21]	.....
Houston, Tex.	4.00[1]	4.50[1]	4.50[1]	5.75[2]	3.988[2]	4.668[2]	4.568[2]	5.763[24]	5.819[16]	4.10[21]	.....
Los Angeles	4.65[4]	4.90[4]	5.20[4]	7.45[4]	5.225[4]	5.30[4]	5.200[4]	6.55[13]	7.425[6]	6.033[21]	5.863
San Francisco	4.20[7]	4.15[7]	4.15[7]	5.85[7]	4.125[7]	5.85[7]	4.50[7]	6.35[15]	6.875[15]	5.783[21]	7.583
Portland, Oreg.	4.70[27]	4.70[27]	5.00[27]	6.75[27]	4.875[27]	6.65[27]	5.000[27]	6.20[15]	6.825[15]	5.983[15]	.....
Tacoma, Wash.	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[15]	6.55[15]	6.23[21]	.....
Seattle	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[15]	6.55[15]	6.23[21]	.....

[o]Basing point cities with quotations representing mill prices, plus warehouse spread; †open market price.

BASE QUANTITIES

[1]—400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [13]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles; [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [23]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.45
Mesabi nonbessemer	5.05
High phosphorus	5.05
Mesabi bessemer	5.20
Old range nonbessemer	5.30

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	13.00

Foreign Ore

Cents per unit, cif Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mn.	Nom.
N. African low phos.	Nom.
Swedish basic, 60 to 68%	Nom.
Spanish, N. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50-8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$39.75
48% 3:1	41.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

Brazilian—nominal

44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

Domestic (seller's nearest rail)

48% 3:1	$43.50

less $7 freight allowance.

Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo, Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 15c to 17c per unit less than Metal Reserve prices.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Designation	Chemical Composition Limits, Per Cent—Carbon	Mn	Si	Cr	Ni	Mo	Basic open-hearth Electric furnaces: Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	$0.812	$16.230	$1.353	$27.050
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.812	16.230	1.353	27.050
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.866	17.312	1.407	28.132
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.703	14.066	1.244	24.886
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542

Extras are in addition to a base price of 2.921c, per pound on finished products and $58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Maximum prices per gross ton fixed by OPA schedule No. 10, last amended July 27, 1946; $2 increase may be charged on adjustable pricing contracts made between May 29 and July 27. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$29.50	$29.00	$30.50	$30.00
Newark, N. J., del.	31.20	30.70	32.20	31.70
Brooklyn, N. Y., del.	32.28	.....	.....	32.78
Birdsboro, Pa., base	29.50	29.00	30.50	30.00
Birmingham, base	24.88	23.50	29.50	.....
Baltimore, del.	30.22	.....	.....	.....
Boston, del	29.68	.....	.....	.....
Chicago, del.	28.72	.....	.....	.....
Cincinnati, del.	28.94	28.06	.....	.....
Cleveland, del.	28.62	27.74	.....	.....
Newark N. J.	30.82	.....	.....	.....
Philadelphia, del.	30.05	29.55	.....	.....
St. Louis, del.	28.62	29.54	.....	.....
Buffalo, base	28.50	27.50	29.50	29.00
Boston, del.	30.06	29.56	31.06	30.56
Rochester, del.	30.03	.....	31.03	30.53
Syracuse, del.	30.58	.....	31.58	31.08
Chicago, base	28.50	28.00	29.00	28.50
Milwaukee, del.	29.73	29.23	30.23	29.73
Muskegon, Mich., del.	32.05	.....	.....	32.05
Cleveland, base	28.50	28.00	29.00	28.50
Akron, Canton, del.	30.04	29.54	30.54	30.04
Detroit, base	28.50	28.00	29.00	28.50
Saginaw, Mich., del.	30.81	30.31	31.31	30.81
Duluth, base	29.00	28.50	29.50	29.00
St. Paul, del.	31.13	30.63	31.63	31.13
Erie, Pa., base	28.50	28.00	29.50	29.00
Everett, Mass., base	29.50	29.00	30.50	30.00
Boston, del.	30.06	29.56	31.06	30.56
Granite City, Ill., base	28.50	28.00	29.00	28.50
St. Louis, del.	29.00	28.50	.....	29.00
Hamilton, O., base	28.50	28.00	.....	28.50
Cincinnati, del.	29.68	29.18	.....	29.68
Neville Island, Pa., base	28.50	28.00	29.00	28.50
*Pittsburgh, del., N.&S. sides	29.27	28.77	29.77	29.27
Provo, Utah, base	26.50	26.00	.....	.....
Sharpsville, Pa., base	28.50	28.00	29.00	28.50
Sparrows Point, base	29.50	29.00	.....	.....
Baltimore, del.	30.60	.....	.....	.....
Steelton, Pa., base	.....	29.00	.....	.....
Swedeland, Pa., base	29.50	29.00	30.50	30.00
Philadelphia, del.	30.43	29.93	.....	30.93
Toledo, O., base	28.50	28.00	29.00	28.50
Youngstown, O., base	28.50	28.00	29.00	28.50
Mansfield, O., del.	30.66	30.16	31.16	30.66

* To Neville Island base add: 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.24, Oakmont, Verona; $1.38, Brackenridge.

Exceptions to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron. Republic Steel Corp. may quote $2 a ton higher for foundry and basic pig iron on the Birmingham base.

High Silicon, Silvery

6.00-6.50 per cent (base) $34.00
6.51-7.00..$35.00 9.01- 9.50. 40.00
7.01-7.50.. 36.00 9.51-10.00. 41.00
7.51-8.00.. 37.00 10.01-10.50. 42.00
8.01-8.50.. 38.00 10.51-11.00. 43.00
8.51-9.00.. 39.00 11.01-11.50. 44.00

Fob Jackson county, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Electric Furnace Ferrosilicon: Si 14.01 to 14.50%, $50 Jackson co.; each additional 0.50% silicon up to and including 18% add $1; low impurities not exceeding 0.005 P, 0.40 Si, 1.0% C, add $1.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn., $33.00. (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $28.00
Valley base 28.00

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $34.00 base; $35.38, del., Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, $31.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Refractories

Per 1000, fob shipping point. Net prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $81.00

High Heat Duty

Pa., Ill., Md., Mo., Ky. 65.00
Ala., Ga. 65.00
N. J. 70.00

Intermediate Heat Duty

Ohio 57.00
Pa., Ill., Md., Mo., Ky. 59.00
Ala., Ga. 51.00
N. J. 62.00

Low Heat Duty

Pa., Md., Ohio 51.00

Malleable Bung Brick

All bases 75.60

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press 42.00
Wire Cut 40.00

Silica Brick

Pennsylvania 65.00
Joliet, E. Chicago 74.00
Birmingham, Ala. 65.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.
Bulk 22.00
Bags 26.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.
Chrome brick 54.00
Chem. bonded chrome 54.00
Magnesite brick 76.00
Chem. bonded magnesite ... 65.00

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net ton, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

Ferroalloy Prices

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn., (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Ferrotungsten: Spot 10,000 lb or more, per lb contained W, $1.90; contract, $1.88; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots $1.35; less-ton lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C $142.50; 3-5% C $157.50.

Ferrovanadium: V 35-55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb. contained Mo, fob. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.l. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.l. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.l. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb. of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

Ferro-Boron: (B 17.50% min., Si 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy contract ton lots $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices up 10 cents.

Ferrochrome: Contract, lump, packed; **high carbon,** eastern zone, c.l. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; **high carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

Low carbon, eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l., and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points. **Low carbon, high nitrogen:** Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C about 5-7%): Contract, lump, packed, eastern zone, freight allowed, c.l. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, high carbon (Cr 60-65%, Si, Mn and C 4-6% each): Contract, lump, packed, eastern zone, freight allowed, c.l. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

S.M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb. Cr, packed, eastern zone, c.l. 9.50c, ton lots 9.80c, less than ton 10.10c, central zone, add 0.3c for c.l. and 0.5c for smaller lots; western zone, add 0.70c for c.l. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb. of briquets; spot prices 0.25c higher.

Chromium Metal: 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.l., 79.50c, 2000 lb to c.l. 80c; central 81c and 82.50c; western 82.25c and 84.75c; fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract ton lots or more $1.35, less, $1.60, pound of metal; $1.36 and $1.61 central, $1.40 and $1.65, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb. of alloy. Contract, carlots, lump 13.00c, ton lots 14.50c, less 15.50c eastern, freight allowed; 13.50c, 15.25c and 16.25c, central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese, containing exactly 2 lb. Mn and about ½ lb. Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Ferrosilicon,** weighing about 5 lb. and containing exactly 2 lb. Si, or about containing exactly 1 lb. Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and 0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%. Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, $1.89, less $2.01, eastern; freight allowed; $1 903 and $2.023, central, $1.935 and $2 055 western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, $1 90, 1 ton to 8 ton, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si, $6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%. Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25 50c, 26 75c and 27.75c, central; 27.50c, 28 90c and 29.90c, western; spot up 0.25c.

Silvaz Alloy: (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c. ton lots 59 00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61 90c and 62.90c, western; spot up 0.25c.

SMZ Alloy: (Si 60-55%, Mn 5-7%, Zr 5-7% and Fe approx. 20% (per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14 05c, 14.60c and 15.10c, western; spot up 0.25c.

CMSZ Alloy 4: (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

CMSZ Alloy 5: (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

Zirconium Alloy: Zr 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot up $5 per ton.

Zirconium Alloy: Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up ¼c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 5.88c; ton lots 6.38c; less 6.88c. Spot up ½c.

Siminal: (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlots 8c; ton lots 8.75c; less-ton lots 9.25c.

Tungsten Metal Powder: Spot, not less than 97%, $2.50-$2 60; freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% NA_2O; or air dried, 83-85% V_2O_5 and 5.15% NA_2O. $1.10 per lb contained V_2O_5, fob plant, freight allowed on quantities of 25 lb and over to St. Louis.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. Quotations are on gross tons.

PHILADELPHIA:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21 25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19 75
Heavy Turnings	18.25

Cast Grades
(Fob Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:
(Dealers' buying prices)

No. 1 Heavy Melt Steel	$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstripped Motor Blocks	17.50
Stove Plate	19.00

BOSTON:
(Fob shipping points, Boston differential 99c higher, steelmaking grades; Providence, $1.09 higher)

No. 1 Heavy Melt. Steel	$14 06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.31
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

BUFFALO:
(Delivered consumers' plant)

No. 1 Heavy Melt. Steel	$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	14.25
Short Shovel Turnings	16 25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15.25
No. 1 Cast	20.00
Low Phos.	21.75

PITTSBURGH:
(Delivered consumers' plant)

Railroad Heavy Melting	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	•20.00
Heavy Breakable Cast.	•16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

• Shipping point.

CLEVELAND:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast.	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

VALLEY:
(Delivered consumer's plant)

No. 1 R.R. Heavy Melt.	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD:
(Delivered consumer's plant)

Machine Shop Turnings	$15.00

CINCINNATI:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
Machine Turnings	10.50-11.00
Shoveling Turnings	12.50-13.00
Cast Iron Borings	11.50-12.00
Mixed Borings, Turnings	10.50-11 00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-22.00
Scrap Rails	20.50-21.00
Stove Plate	18.50-19.00

DETROIT:
(Delivered consumer's plant)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19 82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

CHICAGO:
(Delivered consumer's plant; cast grades fob shipping point; railroad grades fob tracks)

No. 1 R.R. Heavy Melt.	$19.75
No. 1 Heavy Melt. Steel	18 75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dlr. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22 25
Cut Rails, 18-inch	23.50
Rerolling Rails	22.25
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

ST. LOUIS:
(Delivered consumer's plant; cast grades fob shipping point)

Heavy Melting	$17.50
No. 1 Locomotive Tires	21.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.50
Shoveling Turnings	12.50
Rerolling Rails	21.00
Street Car Axles	24.50
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Cupola Cast	20.00
Charging Box Cast	19.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Grate Bars	15.25
Brake Shoes	15.25

BIRMINGHAM:
(Delivered consumer's plant)

Billet Forge Crops	$22.50
Structural, Plate Scrap	19.00
Scrap Rails Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	11.00
Cast Iron Borings	13.00
Iron Car Wheels	20.00

LOS ANGELES:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Dlr. Bundles	12.00
Machine Turnings	5.50
Mixed Borings, Turnings	5.50
No. 1 Cast	20.00

SAN FRANCISCO:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	17.00
No. 1, No. 2 Bundles	9.00
No. 3 Bundles	7.00
Machine Turnings	15.50
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	
Cut, Structural, Plate 1 ft and under	18.00
Alloy-free Turnings	7.00
Tin Can Bundles	14.50
No. 2 Steel Wheels	21.50
Iron, Steel Axles	24.00
No. 2 Cast Steel	20.50
Uncut Frogs, Switches	18.00
Scrap Rails	18.50
Locomotive Tires	20.50

SEATTLE:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.50
No. 2 Heavy Melt. Steel	14.50
Heavy Railroad Scrap	15.50

(Fob shipping point)

No. 1 Cupola Cast	20.00

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 14.12½c, refinery, 20,000 lb or more; 14.37½c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 15.50c; 88-10-2 (No. 215) 18.75c; 80-10-10 (No. 305) 18.25c; No. 1 yellow (No. 405) 12.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis; high grade 9.25c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 8.10c, chemical 8.20c, corroding, 8.20c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland - Akron - Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston - Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 12.75c; No. 12 foundry alloy (No. 2 grade) 12.87½c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.37½c; grade 2 (92-95%) 13.25c; grade 3 (90-92%) 12.00c; grade 4 (85-90%) 11.37½c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, fob refinery 35.00c lb; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c.

Mercury: Open market, spot, New York, $98-$100 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.25 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.30.

Cobalt: 97-99%, $1.50 lb, for 550 lb (bbl.); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y. 90.12½c per ounce.

Platinum: $81.50 per ounce.

Palladium: $24 per troy ounce.

Iridium: $125 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 14.37½c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 25.81c; yellow brass 23.67c; commercial bronze, 95% 26.14c, 90% 25.81c; red brass, 85% 24.98c, 80% 24.66c; best quality 24.38c; phosphor bronze, grade A 4% or 5%, 43.45c; Everdur, Duronze or equiv., hot rolled, 30.88c; naval brass 28.53c; manganese bronze 31.99c; muntz metal 26.78c; nickel silver 5% 32.38c.

Rods: Copper, hot rolled 22.16c, cold drawn 23.16c; yellow brass 18.53c; commercial bronze, 95% 25.83c, 90% 25.50c; red brass, 85% 24.67c; 80% 24.35c; best quality 24.07c; phosphor bronze, grade A 4% or 5% 43.70c; Everdur, Duronze or equiv. cold drawn, 29.82c; naval brass 22.59c; manganese bronze 25.93c; muntz metal 22.34c; nickel silver 5% 34.44c.

Seamless Tubing: Copper 25.85c; yellow brass 26.43c; commercial bronze 90% 28.22c; red brass 85% 27.64c, 80% 27.32c; best quality brass 26.79c; phosphor bronze, grade A 5% 44.70c.

Copper Wire: Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.50c, 15,000 lb or more 23.55c, less carlots 24.05c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 11.25c; cut sheets 11.50c; pipe 9.90c. New York, 10.00c Philadelphia, Baltimore, Rochester and Buffalo, 10.50c Chicago, Cleveland, Worcester and Boston.

Zinc Products: Sheet fob mill, 13.15c, 36,000 lb and over deduct 7%. Ribbon and strip 12.25c, 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lb 12.50c; 100-500 lb 13.00c; under 100 lb 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

PLATING MATERIALS

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

Copper Anodes: In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 25.125c; curved, 20.375c; round oval straight, 19.375c; electro-deposited, 18.875c.

Copper Carbonate: 52-54% metallic Cu, 250 lb barrels 20.50c.

Copper Cyanide: 70-71% Cu, 100-lb kegs or bbls 34.00c, fob, Niagara Falls.

Sodium Cyanide: 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

Nickel Anodes: 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

Nickel Chloride: 100-lb kegs or 275-lb bbls 18.00c lb, del.

Tin Anodes: 1000 lb and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb bbls 39.00c fob Grasselli, N. J.; 100-lb kegs 39.50c.

Sodium Stannate: 100 or 300-lb drums 36.50c, del.; ton lots 35.50c.

Zinc Cyanide: 100-lb kegs or bbls 33.00c fob Niagara Falls.

Scrap Metals

Brass Mill Allowances: Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Yellow brass	9.875	9.625	9.125
Commercial bronze			
95%	11.250	11.000	10.500
90%	11.125	10.875	10.375
Red brass			
85%	10.875	10.625	10.125
80%	10 875	10.625	10.125
Best quality (71-79%)	10.500	10.250	9.750
Muntz metal	9.250	9.000	8.500
Nickel silver, 5%	10.500	10.250	.....
Phos. br., A, B, 5%	12 750	12 500	11.500
Naval brass	9.500	9.250	8.750
Manganese bronze	9.500	9.250	8.750

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¾c for shipment of 60,000 lb of one group and ½c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper and copper borings 11.50c; No. 2 copper wire and mixed heavy copper, copper tuyeres 10.50c.

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbitt-lined brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids; (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

Aluminum Scrap: Price fob point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb, 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

Lead Scrap: Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

Zinc Scrap: New clippings 7.25c, old zinc 5.75c, fob point of shipment, add ½c for 10,000 lb or more. New die cast scrap 4.95c, radiator grilles 4.95c, add ¼c for 20,000 lb or more. Unsweated zinc dross, die cast slab 5.80c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment; add ½c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb contained nickel, plus 8.00c per lb contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.000c; solder sheet 18.00c.

Sheets, Strip . . .

Sheet output cut less than that of other products for holiday recess . . . Priorities congesting schedules

Sheet & Strip Prices, Page 162

Chicago—Taking cognizance of the tremendous unfulfilled demand for sheets and tin plate, one large producer kept these facilities operating on Labor Day, although other departments less seriously jammed closed down for the holiday. Customers press unrelentlessly for shipments to keep their respective plants running at as high level as possible.

Books for 1947 are not yet opened, and during the fourth quarter quotas will be cut to reduce the tremendous carryover. Imposition of the priority system is making schedules more congested and is making for considerable confusion. No sheetmaker knows yet how heavy the priority volume will be.

Pittsburgh—CPA has asked steel producers to hold open the lead time for October scheduling of rated tonnage because of necessity to process additional petitions for preference ratings. An estimated 210,000 tons of steel for fourth quarter delivery already has been given "CC" ratings, while petitions not yet approved are said to represent an additional 400,000 tons. This tonnage is not excessive in comparison with overall production of finished steel, but the difficulty arises from the fact that nearly 90 per cent of the rated tonnage represents light gage hot-rolled sheets and galvanized. For example, there is expected to be very little galvanized sheet production next quarter for other than rated orders. The indicated volume of rated orders is exclusive tonnage resulting from "hardship" cases covering component parts. Sellers are getting many appeals for relief from customers not coming within scope of rated tonnage program. Some of these interests are expected to have to shut down for indefinite periods next quarter for tonnage available to them likely will not be sufficient to sustain normal operations. These consumers point out that near capacity production is essential to make a profit due to high costs.

St. Louis—Sheet production here is at 40 per cent of capacity. Granite City Steel Co. is operating four open hearth furnaces, following settlement of a 21-week strike, and hopes to have three new DPC open hearths pouring by Oct. 1. This addition will raise the present 20,000-ton ingot output to 43,000 tons monthly. Deliveries of flat rolled products are about nine months behind, January schedules being rolled now for shipment in October. No new business is being accepted, due to a heavy carryover in some items. Some sheet steel tonnage is earmarked for railroad cars and for heating furnaces required for the veterans' housing program. A quantity of tinplate due for export to Africa may be canceled or delayed indefinitely. Steel men here are concerned over reports of a growing black market in new and surplus steel.

Seattle—Rolling mills are fully booked to the end of 1946 and are making every effort to reduce the heavy backlogs. New business is being refused and production is handicapped by a large turnover and

general inefficiency of labor. Regular customers are being preferred but it is impossible to serve the trade satisfactorily. Producers will not open 1947 books until the fourth quarter when they will be able to make a closer balance between bookings and probable output.

Philadelphia—Sellers are returning a number of rated orders now being tendered for fourth quarter as they are coming from consumers who are not their regular customers. Those that are being accepted are being applied against orders already scheduled for the buyers, where such orders actually exist. Realization by buyers that this policy is being pursued is undoubtedly accounting for some of the efforts now being made to place tonnage with other than regular suppliers. Sheet mills generally have not been able to appraise the outlook for the remainder of this year sufficiently close to permit them to open their books for 1947. All producers are behind on current commitments, some as much as three months or more. A substantial carryover is likely at the end of the year in numerous instances.

Cleveland—Deliveries of steel to finishing mills declined further last week due to the adverse effect of the scrap shortage on open hearth operations. Sheet and strip producers will be unable to meet their September commitments fully and, unless some solution is found to the scrap problem, production will drop sharply below that for August. Further complicating the situation, finished product producers have been requested to lift the deadline of Sept. 1 on acceptance of rated orders for October delivery. "MM" ratings probably will be applied to orders placed under the Veterans' Housing Program, having priority second only to the "AAA" emergency ratings.

Cincinnati — Sheet mill estimates of carryover tonnage into the fourth quarter are growing larger, due principally to directives. Quotas for fourth quarter, for customers without priorities, will remain uncertain unless the volume of rated orders is restricted. Production is being kept high despite a precarious supply situation in scrap and pig iron.

Boston—Although applications for CC ratings on flat-rolled are substantial, considerable number are denied as not qualifying under the housing program. Drain on fourth quarter schedules will be heaviest in galvanized sheets. An increasing number of industries requiring flat-rolled steel in the ligter carbon gages are concerned as to inventories and are trying to cover for next year. Narrow cold strip production is out of balance with hot strip supply and rescheduling is frequent. Carryovers in cold-rolled strip will be heavy with most producers behind on delivery schedules. Low carbon grades are especially critical with non-integrated mills. For builders, hardware requirements are mounting, as are needs of stamping shops.

Tubular Goods . . .

Tubular Goods Prices, Page 163

Pittsburgh—Most cast iron pipe producers have fallen well behind on projected delivery schedules due to pig iron shortage; and this in turn has held up a number of municipal projects two to three months. Soil pipe interests have been able to increase output due to in-

creased receipts of pig iron under CPA's certified tonnage program for August and September.

Exceptional heavy demand is expected to keep jobbers' inventories of standard steel pipe and tubing well below normal for many months. Producers are booked solidly through remainder of this year on small diameter light wall tubing; on larger sizes some openings in production schedules are available for late December. Unusual heavy tubing demand is noted from the automotive and railroad industries. Producers do not anticipate much interruption to production schedules resulting from CC-rated tonnage in fourth quarter.

Seattle—Less inquiry is reported for cast iron pipe but this is attributed to delivery uncertainty and other factors. Potential business in this area is of major proportions. The city of Vancouver, Wash., opened bids last week for 300 tons of various sizes of pipe.

Steel Bars . . .

Shortage of smaller sized carbon stock prevents many metalworking plants from attaining production goals

Bar Prices, Page 162

Boston—Material shortages, which for many means carbon bars in smaller range of sizes, is the main drawback in the failure of numerous metalworking plants to reach scheduled production levels. With few exceptions consumer inventories are out of balance in both hot and cold-drawn carbon stock, although most manufacturers manage to maintain production schedules. Buyers are seeking coverage on part of next year's requirements and many are asking for tonnage in excess of probable volume available, at least during the first half. Duplicate orders appear to have been weeded out, and the liklihood of placing multiple volume now appears dim. Hot-rolled alloys are relatively easy for October delivery, but cold-drawn alloys in smaller sizes are more extended.

Pittsburgh—Until producers have a clearer indication of the amount of rated tonnage they must schedule for fourth quarter and extent of probable carryover tonnage, opening of books for first quarter scheduling will be delayed. Overall output through July and August was below expectations, further complicating present order backlog position of some producers. Most interests are discouraging forward ordering but are accepting new business without making commitments as ot probable delivery. No appreciable rated tonnage has been placed with mills to date, but such tonnage is expected to be sizable, particularly from farm implement industry. Sellers are booked solidly through remainder of this year on all except alloy bar items, on which October delivery is available. Automotive parts manufacturers and most forge shops have been able to slightly increase production schedules in recent weeks, although they do not expect any significant increase in steel supply through rest of year. Cold finishers are operating close to capacity but are unable to make much headway against large order backlogs. Some interests have openings in late fourth quarter on

larger sizes; all are booked through year on popualr sizes.

New York—Except for a limited tonnage of cold drawn bars in the larger sizes, which can still be had for late December shipment, producers of carbon bars are sold out for the remainder of the year. Carryover on hand is heavy, especially in small sizes of hot carbon bars. It appears likely that they will go into next year with a sizable carryover, although where mills are shipping on a quarterly quota basis they may reduce their fourth quarter quotas with a view to catching up somewhat on their current commitments by the end of this year. Deliveries on hot alloy bars remain easy with consumers having little dififculty in obtaining promises on hot-rolled grades for October and beyond.

Philadelphia—Producers of hot carbon bars are so far behind on their commitments of smaller sizes that there is little doubt that some, when they open books for 1947, will be unable to accept anything for the first quarter. Certain observers believe their position will be even more extended.

Alloy bars and large sizes of cold drawn, the latter in limited amount for late December, are the only bar items available for shipment this year, except tonnage that must be accepted by ratings and special directives.

St. Louis—Pressure on merchant bars is undiminished. Acceptance of most new orders was stopped a month ago until drawers could ascertain the extent of their carryover. In general, 1947 books are filled for the first half. Schedules are expected to be worked out on a system of allocations based on customers' prewar deliveries. The problem is to prevent consumers, who received large war tonnage under priorities and are now attempting to get the same volume for peace manufacture, from usurping the steel supply of manufacturers who did little or no war work. Another complication is that ODT's directive on full car shipments is compelling mills to ship to some customers out of turn, to the detriment of others who happen not to be in the vicinity of the car's destination.

Production has remained at capacity the last four months. Deliveries average a month behind schedule, although shipments of wire are about on time and strip six to eight weeks behind. Demand for bars 2 inches and less and flats 6 inches wide and a quarter-inch and thicker, continues high and steady. There is no open space in schedules for the next six months. Beyond that drawers are committing no space except on a mill-convenience basis.

Steel Plates . . .

Tank production restricted due to scarcity of light gage plates . . . Shipments lag several months behind schedule

Plate Prices, Page 163

New York—Plate fabricators, particularly those engaged in producing light fuel oil storage tanks, requiring light gage plate, are running behind schedules because of difficulty in obtaining mill shipments. Most fabricators are booked

for many weeks ahead and see little possibility of meeting promises for some time to come, as most plate mills appear to be making little progress in getting caught up on their arrearages. Certain producers are behind three months and beyond on their current commitments. However, there may be some easing in scrap and pig iron over the fall months with a resultant improvement in operations, which should rebound to the advantage of plate fabricators.

Boston—For small tanks, demand for which is holding at high peak, fabricators are short of light gage welding quality plates. While plate shops with heavier backlogs are unable to place all tonnage required for recently accepted contracts. Deliveries are behind schedule on much tonnage and warehouse stocks of light sizes are depleted by demands of shops normally supplied directly by mills. Coordinating plate and head supply is also a major problem with tank builders; some have heads but are short of plates while in other cases this is reversed, although inventories of both are generally limited. Substantial demand holds for weldments, contributing to the heavier size ratio which on the whole is less apparent in this area.

Philadelphia—Continued disruption of output as a result of shortage of scrap and pig iron, particularly the former, is forcing plate producers further behind on their commitments. Their arrearages now averages three to four months, with at least one producer behind as much as five months or more. This situation, combined with some limited booking for next year, has placed at least two producers out of the market on unrated tonnage for not only the remainder of this year, but virtually the first-half of next year as well.

Seattle—Plates are in strong demand here but shops are handicapped by lack of steel and a heavy turnover in labor. Birchfield Boiler Co. has completed a 140-foot, all steel welded deep sea trawler equipped with a 1200 horsepower General Motors diesel engine, said to be the largest craft of that type built on the West Coast. Specifications are out for additional storage facilities at Portland for Texas Oil Co., involving two 80,000-barrel oil tanks and representing a $100,000 project. Because of moratorium restrictions, U. S. Engineer, Portland, Oreg., again has rejected bids for 70 steel pontoons.

Wire . . .

Wire Prices, Page 163

Pittsburgh—Demand for manufacturers and merchant wire remains well above present near-capacity output. Many consumers are attempting to get on first-quarter production schedules with little success. At least one producer recently returned customers' orders it had been holding on basis of possibly meshing them into fourth-quarter schedules; but due to strikes and other production tie-ups carryover tonnage makes this impossible. In some instances the returning of these orders created considerable ill-feeling among customers. Mills are not expected to open books for first-quarter delivery until early October, at which time they hope to have a clearer picture of their order backlog position in respect to probable carryover tonnage into next year. Some mills, while not encouraging forward ordering, are accepting new business without making any commitment as to likely delivery.

Critical shortage of wire rods continues to restrict output of nonintegrated wire producers, and there is little prospect that this situation will record much improvement through remainder of this year. Inadequate galvanizing facilities, however, continue to retard finishing operations in some instances. Output of merchant wire items has recorded some improvement in recent weeks, particularly in nails. Producers state the tight supply in nails has been accentuated by CPA directives for packaging a large peanut crop in the south. These directives reduce overall mill output, producers state, for they involve straight carloads of one size which necessitates reiuggling of production schedules. Inadequate supply of nails for housing program is offset by critical shortage of other building materials. Large tonnage export inquiries continue, particularly for South America and Mexico, but bulk of these inquiries is not being booked.

Chicago—Some easing has been noted in the supply of hot-rolled bands and angles. Spring wire continues to be in heavy demand by the farm implement industry and other manufacturers. Makers of cold-headed products are leaning more and more toward the smaller sizes of wire, already a tight market. Nail situation shows little change, although there is a gradual shifting in demand from industrial to building types. Production

of bale ties and baling wire is improving, but the advantage is being offset by prospects of a bumper hay crop. REA has a huge expansion program in prospect, but it is being retarded more by lack of poles than conductors. Wire rope is the only product exceeding demand at present.

Boston—Although wire mill equipment is geared for high-speed production, in excess of prewar levels, the tonnage that might be expected is not being produced. Output per man is down and there is a shortage of rods. Schedules are centered heavily in high carbon specialties and consumers of low carbon grades are in need of steel. Fourth quarter quotas to consumers will not provide for more tonnage and some may be slightly reduced. Demand for spring wire is strong. Only rope and welding wire are relatively slow. Pressure from automobile industry has eased slightly and in scattered instances shipments are deferred.

New York—No increase in supply of rods is indicated for fourth quarter and quotas to nonintegrated mills may be further reduced slightly. Mills producing rods are drawing more finished wire and therefore have less tonnage to sell. Inventories with most wire users are depleted and pressure for many grades is heavy, notably upholstery spring wire. Hardest hit are users of low carbon basic material, so-called cheaper wires on which production is restricted. Some consumers are so short of supplies they are accepting shipment on material not meeting usual specifications. There is no improvement in supply of building nails.

Structural Shapes . . .

Fabricators say steel supply outlook brightens. Geneva plant probably will be producing plates soon

Structural Shape Prices, Page 163

Pittsburgh—Further drastic curtailment in nonresidential construction will not be immediately reflected in fabricators' activity for the reduction does not affect construction programs already approved. However, fabricators are concerned over the indicated enforced reduction in industrial and commercial construction for an indefinite period ahead. While fabricators currently have near record order backlogs, due primarily to restricted activity as result of limited steel supply, they contend that steel supply outlook is brighter which should make it possible to make a cut in unfilled business. Carryover tonnage on mills' books represents about 10 weeks' output, with most interests booked through 1946 and not yet scheduling first-quarter tonnage. Leading producer here soon expects to be producing shapes at its Geneva plant, which should ease the delivery situation somewhat for eastern customers.

New York — Although featured by the placing of 5000 tons for the Abraham Lincoln Housing project, this city, local structural demand has declined appreciably, reflecting further CPA restrictions on nonhousing construction. This project is for the Municipal Housing Authority, with the steel going to the Harris Structural Steel Co., New York.

Boston—More applications for non-

housing projects are denied than approved, increasingly curtailing structural steel inquiry. Considerable work is behind schedule, notably bridge and highway construction with federal aid. Connecticut and Massachusetts programs are behind. One structural mill is averaging only three days a week, but total shipments are holding fairly heavy. No general easing in plain material is yet apparent. Recent contracts include approximately 1000 tons to Bethlehem Steel Co., Bethlehem, Pa., 575 tons being for industrial expansions by Boston Woven Hose & Rubber Co., Cambridge, and Pneumatic Scale Co., packaging machinery builders, Norfolk Downs, Quincy, Mass.

Seattle—Structural steel fabricators are very short of material and consequently are unable to bid on many attractive jobs. Some small orders are being taken but deliveries are uncertain. The labor efficiency is well below normal with turnover unusually heavy.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 163

Chicago—Reinforcing bar business continues to sag considerably, not from lack of demand but from lack of steel. Attractive construction projects are being turned away without bids because no improvement in supply is expected in the foreseeable future. Recent large orders bearing MM ratings have forced revision in October quotas to customers.

Pig Iron . . .

Pig Iron Prices, Page 165

Pittsburgh—Announcement is expected momentarily of a pig iron premium price plan of $8 a ton on malleable and foundry iron to stimulate overall output. The premium price will be applicable on all tonnage produced in excess of established quotas and is expected to make it possible for some "high-cost" furnaces to resume operations. About 50 per cent of the 350,000 tons of merchant pig iron channeled to foundries is being certified, making it imperative to augment production to meet essential needs of automotive and other interests not coming within the scope of CPA's certified tonnage program. There is every indication that this program will be extended for fourth quarter, although no official announcement to this effect yet has been made.

Unless substantial increase in pig iron production develops in near future, many foundries soon will have to begin tapering operating schedules. At present 49 out of 54 blast furnaces are pouring iron in this district.

Chicago—Tightness in pig iron, which has existed here for many weeks, is increasing in other markets, lessening the prospects of distant iron moving here. Heavier foundry operations have consumed backlogs to narrow limits, making melters more dependent upon current receipts. Shortage of scrap also hampers foundry operations. Demand for castings is tremendous and backlogs are accumulating. Only solution for increased production seems to lie in increased blast furnace operations, thus some interest is being displayed in Housing Expediter Wilson W. Wyatt's proposal of increasing output by offering a subsidy of $8 per ton for types needed in the housing program. Currently, 37 of the 41 blast furnaces in this district are active.

St. Louis—Pig iron supplies are tight, but there is no real distress except among smaller foundries. Scrap inventories so far are large enough so that increased use of pig to offset scrap shortages reported elsewhere is not necessary. The margin, however, is so narrow that any substantial decrease in scrap will result in curtailment of steelmaking operations. Pig output has remained at capacity here several months. Shipments from outside points are fairly constant and in volume enough to take care of critical cases. Scarcity of railroad cars hasn't affected the flow but melters are apprehensive it may. Pig reserves average under 30 days, with some foundries under a week. Iron producers express cautious optimism that CPA's incentive bonus proposal to increase production may aid high-cost producers and put some idle furnaces to work, but on the other hand fear the system may prove too complicated. It is regarded as the only hope, however, of increasing iron supplies in this district.

Philadelphia—Shipments of certified tonnage here for September will be slightly less than in August, some pig iron sellers believe. This is ascribed principally to the fact that the 10 per cent in the tonnage of all certified consumers, except soil pipe makers, came so late last month that some furnaces already had virtually completed their shipment schedules. The cut still applies this month and is being made effective from the first. Hence, consumers not engaged in priority work will receive a little

more tonnage, but not nearly enough to satisfy their demand. In fact, in view of this situation and with cast scrap so extremely scarce, some foundries will be down for at least part of this month.

Cincinnati — Some furnace interests are slow in announcing September allotments of pig iron to district melters, already hard-pressed for supplies and nearing the bottom of stockpiles. August shipments were fairly prompt, particularly in southern iron, and in volume only modestly short of allocations earlier in the year.

Buffalo — Leading merchant iron producers claim it is impossible to fill current foundry requirements as long as ingot makers confine their blast furnace operations to basic iron. Nine out of fifteen active blast units in the area are turning out basic iron for open hearths.

The iron market is as tight as during the war but efforts are being made to take care of regular customers along with allocations. The tight supply situation became further aggravated as one of the top producers reported output affected by a poorer grade of coke. The coke shortage has become more serious.

Complaints of operations being stymied by short iron supplies continue to pour in from foundries. The scramble for railroad cars also is a problem for producers. One producer is resorting to the use of barges in an effort to get more of the iron moving to the eastern seaboard.

Boston—Only foundries with certified tonnage are maintaining operations, chiefly in the malleable group. Others are reducing melt because of the lack of iron and probably a score are closed. Rated orders on blast furnaces are higher this month than last and those shops now low on iron will not get much relief in the foreseeable future.

Scrap . . .

Inventories drop further as shipments virtually halt due to price uncertainty . . . Situation critical in many districts

Scrap Prices, Page 166

Pittsburgh — Movement of scrap through dealers' yards has come to a virtual stop as result of uncertain price outlook, a condition which is accentuating the already critical tight supply situation. Considerable amount of scrap is being shipped directly to the mills from metalworking plants but this tonnage is wholly inadequate with producers drawing heavily on inventories to maintain present near-capacity operations. The steel industry's inventory of purchased and home scrap is said to represent about two weeks' supply at present rate of operations. However, stocks are not distributed evenly among various steel plants, with some interests said to have as little as two days' supply. In a number of instances open hearths have had to be shut down due to scrap shortage. Leading producer here has been forced to ship over 24,000 tons at considerable added expense into the Chicago district to help alleviate the critical situation there.

Chicago—With news that the industry advisory committee is recommending to OPA that scrap price ceilings be increased, business here has virtually dried up. It appears that only prompt action by the agency can release the log jam. Meanwhile, mills and foundries are tapping meager inventories to keep operations at near capacity level. Instances are reported where mills trade scrap for rolled steel, but even this nets only small amounts of material. Through efforts of salesmen, steelmakers and foundries occasionally find sources of tonnage to keep production moving a while longer.

New York — With scrap shipments already at a low ebb, pending clarification of prices, business in the local area is being further restricted by the inability of the yards to truck scrap because of the general truckers strike in the metropolitan area. Although drivers of the scrap trucks are not members of the truckmen's union on strike and the trucks are owned by the scrap yards, members of the union on strike will not permit them to operate. Low phos is still moving into the Pittsburgh area for open hearth use.

Boston—Shipments of steel scrap are practically at a standstill, pending expected upward revisions in prices. Steel mills are operating on a day-to-day basis with ingot production under constant threat of curtailment. Foundry scrap, including cast, is moving in slightly better volume, but the total is still small.

St. Louis—Scrap shipments continue to slacken pending outcome of the advisory board's recommendation to OPA for a price increase. Whatever the decision, dealers expect it to reduce substantially the metal hoarding at collection points. Mill inventories here are still 30 to 60 days, with some foundries down

to a week or less. Even those better fixed, however, are dipping into ground stocks, especially in cast scrap. Foundries in critical condition are reported offering to take truckload shipment.

Reports are widespread of a black market in scrap in which up to $15 over ceiling is paid. There are reports too of barter proposals—so far rejected here—in which three tons of scrap is offered for one ton of finished steel to be disposed of at warehouses prices or by export. Mills feel this would be mortgaging their output and deny they will participate in such deals unless forced. Such barter schemes mainly involve scarce rails which mills would roll into reinforcing bars.

Little surplus scrap is hitting the market, although brokers assert thousands of tons lie idle but undeclared. They point particularly to a number of war plants and their machines and to a large quantity of steel landing mats.

Seattle—Scrap buyers here hope the national campaign to bring material out of hiding will prove successful, since the supply situation is approaching an acute stage. Under present conditions shippers are not interested, shipyard sources are exhausted, and mills are consuming more than they can buy. Consequently inventories are dwindling. Increased labor costs in preparing material are blamed to some extent for the shortage.

Cleveland—Movement of scrap in this district last month remained low and decreased slightly below that of July. Brokers do not look for any substantial rise in the supply until OPA permits a higher price level. Attempts to bring in material from remote areas have been unfruitful since tightness is widespread and a ready market can be found for all available supplies at nearby points. While the situation is not as critical here as it is in several other districts, some mills have been forced to close due to the shortage. The recent OPA ban on the payment of above ceiling prices for prepared scrap by dealers has tended to stabilize the market and eliminate "raids" by outside interests on desirable tonnages.

Philadelphia—Higher prices are expected to result in improvement in the flow of yard scrap, which recently has been at the lowest level in a number of years. However, some shortages will continue for a considerable time, as consumer inventories are virtually nil.

San Francisco—Shipbreaking to augment the Pacific Coast's supply of scrap started last week in Oakland by American Iron & Metals Co. Ten surplus ships were purchased from the Maritime Commission last spring but breaking was delayed because of difficulty in securing a yard. Present plans call for the shipment of 2000 to 3000 tons of scrap a month to mills. The ten ships are expected to yield between 20,000 and 30,000 tons of No. 1 heavy melting grade scrap.

Cincinnati—Shortage of iron and steel scrap is proving a constant threat to foundry and steelmaking operations. A considerable part of shipments to mills is on a reciprocal arrangement, without dealer participation. Several interests report scrap inventories exhausted, and dependence on current receipts. No estimate is available on tonnage hoarded in expectation of higher prices, although there has been prolonged complaint that allowance for preparation is too narrow.

Buffalo — Fresh tension gripped the scrap trade last week as virtually all shipments were held up by dealers awaiting the OPA's announcement on future price ceilings. Dealers not only suspended deliveries but reported yard receipts were negligible as suppliers of unprocessed material were sitting back expecting to get higher prices.

Meanwhile, leading mill consumers dug wide gaps into vanishing reserve stocks to maintain present production. Two of the three top mill consumers are dangerously low on scrap supplies. One reported operating on a hand-to-mouth basis. Upgrading of scrap continues. A mill which found it necessary to strip all cars in a search for alloy material reported a large number of rejections Receipts by water continue light, but one buyer expects three more boatloads, carrying approximately 15,000 tons, to arrive before the current season ends.

Warehouse . . .

Warehouse Prices, Page 164

New York—Truck drivers strike halted warehouse deliveries last week, affecting both outgoing and incoming tonnage, although distributors unloaded mill shipments from railroad sidings. Heavier products predominate in improved carbon steel receipts from mills, lighter gages and sizes lagging; structurals are especially tight in all sizes. Warehouse quotas are also reduced on products required for the housing program, notably galvanized sheets, nails and shapes. Plate inventories are at the lowest level since the war with most distributors. Alloy stocks are well balanced, an exception to the general rule. Warehouses are not compelled to accept priority orders unless stock is available and hence they generally are not building up back orders.

Pittsburgh—With direction 12 to M-21 expiring Sept. 30, steel distributors expect fourth-quarter mill shipments to be reduced moderately unless they are are granted preference ratings. Reflecting increased mill deliveries last month, shipments from warehouse stocks were somewhat larger. However, the increase in mill receipts was not uniform throughout the range of steel products, with very little improvement in deliveries noted in galvanized, hot and cold-rolled sheets and small size bars. Warehouses also report unbalanced inventories in small angles, wide flange beams and plates. Alloy bar stocks are in good shape with demand relatively small in comparison to other items. Very active demand is noted for cold-finished bars, cold-drawn seamless tubing and merchant wire items.

Cincinnati—The early-September demand for steel from warehouses was as active as heretofore, and in the same items. Outlook for sales depends almost entirely on receipts from mills, as inventory position has steadily declined. The supply situation for fourth quarter was clouded by mill problems in rated orders.

Boston—Warehouses are getting more steel, but the improvement in lighter carbon products is less pronounced than in heavier sizes and gages, notably flat-rolled. Plate shipments are also slow and distributors are depleting inventories; structurals are scarce with demand on warehouses heavy. To meet housing demand for galvanized sheets, warehouses have small stocks, but heavier shipments of steel pipe are enroute from some mills. Unless the warehouse directive is extended or warehouse load priority is established for fourth quarter, some decline in warehouse quotas for the period is indicated; some mills will about meet the quota this quarter at the expense of direct consumers, but plan to schedule heavier for the latter in the fourth.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 163

Pittsburgh—Output of nuts, bolts and rivets has improved slightly in recent weeks due to somewhat better steel supply and fact most producers can make a small profit at present price levels. However, shortage of small bars, nut flats, wire and wire rods continues to restrict overall output. Production prospects are better for the remainder of this year, but producers do not anticipate substantial relief from current steel shortage in near future. Effort of CPA to expedite movement of essential steel items for railroad car construction and repair program may result in increased output of track spikes and bolts. Sellers state new demand is heavy and, despite increased production, little headway is being made against order backlogs said to average about six months.

Rails, Cars . . .

Track Material Prices, Page 163

New York—Car buying continues active, especially in the placing of box

cars, with the New York Central having just placed 2000 with its own shops in East Hartford, N. Y., including 1000 automobile box cars. Final figures for August are expected to reveal a substantial number of cars placed by the domestic lines in that month. It appears doubtful if the volume will equal the July total, which was by far the heaviest for the year up to that time, but it should amount to the second largest figure since the beginning of the year.

New York—Car inquiry continues active with the Baltimore & Ohio in the market for 2000 hopper cars, equally divided between 50-ton and 70-ton capacity cars. American Refrigerator Transit Lines, jointly owned by the Wabash and the Missouri Pacific, is contemplating the purchase of 2000 refrigerator cars.

Nonferrous Metals . . .

Nonferrous Prices, Page 167

New York—Low production and confused distribution of what metal is available, due to price uncertainties, is taking full toll in continued shortages of major nonferrous metals in most of the larger consuming industries. Heavy withdrawals from government stockpiles continue to make up deficiencies in supply.

Shipments of copper to consumers will be heavier this month than in August. Trading in foreign copper is active at 16.375c, fas New York. Although practically all forms of copper are short, wire appears to be among the tightest.

Lead price is declared to be adequate by OPA in reaffirming the 8.25-cent ceiling and the Compliance Division of CPA has been requested to check on stocks. The automobile industry is short of lead, as well as other metals including copper, and other industries are similarly affected, forcing curtailment of production of some consumer goods. Refiners of soft pig lead must obtain authorizations to dispose of any lead not subject to CPA's 25 per cent reserve that has not been sold by the 20th of each month. This lead will be subject to CPA allocation. Foreign lead price is 10.25c.

Zinc supply is dangerously low, especially for galvanizing. The price situation still is uncertain.

Tin Plate . . .

Tin Plate Prices, Page 163

Chicago—For the moment, box car supply is not impeding shipments of tin plate, consequently stocks are not piling up on shipping docks. However, the situation remains precarious and trouble lies ahead if railroad predictions are borne out. Because of the unprecedented demand for tin plate and sheets, one large steelmaker kept these facilities operating on Labor Day, although curtailing other departments.

Bethlehem Steel Contracts For Swedish Iron Ore

Bethlehem Steel Co. has resumed its purchases of Swedish iron ore, having contracted for 1 million tons for shipment, beginning with September, over the next 12 months. This is the first order by Bethlehem for this ore since purchases were interrupted by World War II. High iron content of the ore compensates in part for ocean rates, which are still well above normal.

Some relatively small shipments of Swedish ore have been received in this country earlier in the year.

WAA Offers To Sell 8000 Feet of Used Cast Iron Pipe

About 8000 feet of 12-inch cast iron pipe has been removed from the ground at Bluebonnet Ordnance plant, McGregor, Tex., and will be offered for sale "as is, where is" at $2.25 per foot, War Assets Administration announced recently. The pipe was purchased and installed at the ordnance plant early in 1941 at an overall cost $4.50 per foot. WAA estimates that cost of removing the pipe by private concerns would have approximated 37 cents per foot.

Electrical Equipment Ordered For Reclamation Projects

Electrical equipment for the Bureau of Reclamation's Seminoe power plant and the Alcova and Casper substations in Wyoming, is being purchased under a $156,229 contract recently awarded, according to Commissioner of Reclamation Michael W. Straus.

The contract was awarded Allis-Chalmers Mfg. Co., Milwaukee. It covers purchase of transformers and oil circuit-breakers and includes $4155 for spare parts. Delivery must be made within 270 days from the time the contractor receives notice of the award. The equipment will be installed by the government.

The Seminoe power plant and the Alcova and Casper substations are features of the Bureau of Reclamation's Kendrick project on the North Platte river in Wyoming. Seminoe dam and power plant are located approximately 72 miles by road southwest of Casper. The project will provide irrigation for 66,000 acres of land.

A contract for construction of a 63-mile transmission line from the Seminoe power plant to Casper, to help meet an increasing demand for power for oil drilling operations and other industrial activities in central Wyoming, was awarded by the Bureau in June.

Five Firms Awarded 21,000 Surplus Planes for Scrap

Acceptance of bids from five companies for purchase of nearly 21,000 surplus war planes for scrap, salvage, and other non-flight purposes has been announced by Robert M. Littlejohn, War Assets administrator. The bids were accepted following approval by the Department of Justice and by a Board of

Review composed of War and Navy Department officers and other high government officials.

The planes, which cost the government approximately $3,900,000,000 consist principally of fighters, bombers, and other tactical aircraft which are not suitable for use in civil aviation. This sale will make available to industry approximately 200 million pounds of aluminum alloy and other metals.

The successful bidders and the amount of their bids, together with the approximate number of planes purchased and their locations, are as follows:

Martin Wunderlich, Jefferson City, Mo. $2,780,000 for 5540 planes at Kingman, Ariz.; Sharman Machine & Iron Works, Oklahoma City, Okla., $1,168,550 for 7600 planes at Clinton, Okla.; Texas Railway Equipment Co., Houston, Tex., $1,817,738 for 4890 planes at Walnut Ridge, Ark.; Compressed Steel Co., Denver, Colo., $411,275 for 1540 planes at Albuquerque, N. Mex.; and Sharp & Fellows Contracting Co., Los Angeles, Calif., $404,593 for 1390 planes at Ontario, Calif.

Production of Electrical Machinery Hampered in Brazil

Brazilian electrical machinery output has been handicapped by lack of technicians and research laboratories, due to the short period in which production in this field has been in progress in the country.

However, Brazil has the rolling mills and alloying mills, and has produced flexible wire for some time, it is stated. Among electrical supplies manufactured in the country are wall plugs, flexible and high tension wire, switches, motors, transformers, small generators, welders, battery chargers, and lamps.

One of Switzerland's largest machinery manufacturers, making sewing machines and munitions components, is reported planning an expansion program.

Jap Production of Ball and Roller Bearings Increases

Production of ball and roller bearings in Japan showed a 7 per cent increase in value for May, 1946, compared with April, according to the Department of Commerce, based on reports of the American military authorities in Japan.

Actual unit output dropped from a value of 520,015 yen to 409,041 yen in April, despite the gain in volume.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

15,900 tons, six buildings at Rock Hill, N. C., for Celanese Corp. of America, to Bethlehem Steel Co., Bethlehem, Pa.

11,350 tons, 154 railroad bridges in China,

placed through Chinese Supply Commission, Bethlehem Steel Co., Bethlehem, Pa.; 37 of the bridges will be of the deck plate girder type and 117 of through plate girder construction.

1900 tons, galvanized transmission towers, Pennsylvania Power & Light Co., to Leigh Structural Steel Co., Allentown, Pa.

310 tons, coal processing plant, Herrin, Ill., for Freeman Coal Mining Corp., to American Bridge Co., Pittsburgh.

200 tons, building, St. Cloud, Minn., for Gamble Stores, to Iowa Steel & Iron Works, Cedar Rapids, Iowa.

130 tons, building, Charles Lennig Co., Philadelphia, to Leigh Structural Steel Co., Allentown, Pa.

STRUCTURAL STEEL PENDING

1800 tons, women's dormitories, Penn State College, Penn State, Pa., bids Sept. 16.

1100 tons, bridge, A195-B-62, for Albuquerque division, Atchison, Topeka & Santa Fe railroad.

1000 tons, including 600 tons sheet piling and 400 tons structural steel, contract D-8, Dearborn street subway, Chicago, for Department of Subways and Superhighways; Peter Kiewit Sons Co., Chicago, and S. A. Healy Co., Chicago, joint low bidder on general contract at $8,235,134; bids Aug. 29.

750 tons, bridges, Ft. Bragg, Calif., for state highway department.

500 tons or more, Frederick & Nelson department store addition, Seattle; bids soon.

450 tons, new apartment building, Tudor Plaza Corp., to the R. S. McMannus Steel Construction Co.; general contractor Boehm Construction Co. Inc., all of Buffalo.

400 tons, beam spans, Dallas, Tex., for state highway department.

400 tons, hospital addition, Allentown, Pa.

400 tons, Maryland state overpass over Baltimore & Ohio tracks, J. D. Hedin, Washington, low on general contract.

355 tons, two underpasses, route 6, section 22A, Totowa township, Passaic county, New Jersey; bids Sept. 24, Spencer Miller Jr., state highway commissioner, Trenton.

350 tons, factory building, Chicago, for Atlantic Brass Works.

300 tons, store addition, Flint & Kent, Buffalo, to the R. S. McMannus Steel Construction Co., Buffalo.

300 or more, warehouse at Coulee Dam, Bureau of Reclamation; National Steel Works San Diego, Calif., low, $60,971.

225 tons, building, Du Pont plant, Toledo, O., bids asked. This is in addition to structure recently awarded.

149 tons, bridge, Sec. 1-F, McLean county, Ill., for state; Illinois Steel Bridge Co., Jacksonville, Ill., sole bidder on new bids Aug. 27.

120 tons, bridge, Sec. 45-F, Pike county, Ill., for state; Illinois Steel Bridge Co., Jacksonville, Ill., sole bidder on new bids Aug. 27.

60 tons, two underpasses, route 6, section 22A, Totowa township, Passaic county, New Jersey; bids Sept. 24, Spencer Miller Jr., state highway commissioner, Trenton.

Unstated tonnage, Fallon pumping plant, Buffalo Rapids project, Montana; George T. Gearhardt Co., San Francisco, low at $2497.

Unstated tonnage, machine shop, Nyssa, Oreg., Bureau of Reclamation; Montana Titan Steel Products Co., Portland, Oreg., low at $3600.

Unstated, new $1,200,000 food market, warehouse, offices, repair shop and garage for Danahy-Faxon Stores Inc., Buffalo, general contractor the Turner Construction Co., New York.

REINFORCING BARS . . .

REINFORCING BARS PENDING

2600 tons, contract D-8, Dearborn street subway, Chicago, for Department of Subways and Superhighways; Peter Kiewit Sons Co., Chicago, and S. A. Healy Co., Chicago, joint low bidder on general contract; bids Aug. 29.

1300 tons, Idlewild municipal air port, New York city, Del Balso Construction Co., that city, low on general contract.

300 tons or more, Washington state overpass, Stevens county; McRae Bros., Seattle, low $471,502, general contractor.

230 tons, highway and bridge, route 45, section 22, and route 44, section 9A, Westville to Verga, Gloucester county, New Jersey; bids Sept. 24, Spencer Miller Jr., state highway commissioner, Trenton.

200 tons or more, Washington state underpass.

80 tons, highway and bridge, route 45, section 22, and route 44, section 9A, Westville to Verga, Gloucester county, New Jersey; bids Sept 24, Spencer Miller Jr., state highway commissioner, Trenton.

65 tons, treatment plant, Pullman, Wash.; bids Sept. 24.

Unstated tonnage, Frederick & Nelson department store addition, Seattle.

Unstated tonnage, irrigation canal project at Wenatchee, Wash.; Goodfellow Bros., Wenatchee, general contractor, $50,381.

PIPE . . .

CAST IRON PIPE PLACED

230 tons each to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J., and Pacific States Cast Iron Pipe Co., Provo, Utah, for Wapato, Wash.

PLATES . . .

PLATES PENDING

Unstated tonnage, welded penstock for Cascade Dam; American Pipe & Construction Co., Portland, Oreg., apparently low, $13,940.

Unstated, two 80,000 bbl storage tanks for Texas Oil Co., Portland, Oreg.; specifications out, bids soon.

Unstated, 70 steel pontoons for U. S. engineer, Portland, Oreg.; Gunderson Bros. Engineering Co., Portland, low $74,550 but bids rejected because of moratorium; new bids may be called later.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago & North Western, 40 streamlined passenger cars, comprising 27 coaches, 9 parlor cars and 4 baggage cars, placed with Pullman-Standard Car Mfg. Co., Chicago.

Delaware Lackawanna & Western, 19 coaches, comprising 15 light weight passenger cars, placed with the American Car & Foundry Co., New York, and 2 dining cars and 2 tavern-lounge cars, with the Budd Co., Philadelphia.

Donner-Hanna Coke Corp., 85 seventy-ton triple hopper cars to American Car & Foundry Co., New York.

New York Central, 1000 box cars and 1000 automobile cars, to its shops at East Rochester, N. Y.

Reading Co., 16 electric passenger cars for suburban operation, to American Car & Foundry Co., New York.

Western Maryland, six hundred 55-ton steel hopper cars, to Bethlehem Steel Co., Bethlehem, Pa.

RAILROAD CARS PENDING

Atlanta & Saint Andrews Bay, 100 fifty-ton gondola cars, bids asked.

Baltimore & Ohio, 2000 hopper cars, bids asked.

Detroit, Toledo & Ironton, 200 fifty-ton steel box cars and 100 seventy-ton steel hopper cars, bids asked.

LOCOMOTIVES PENDING

Rhodesian Railways, six 2-10-2 type steam locomotives, bids asked.

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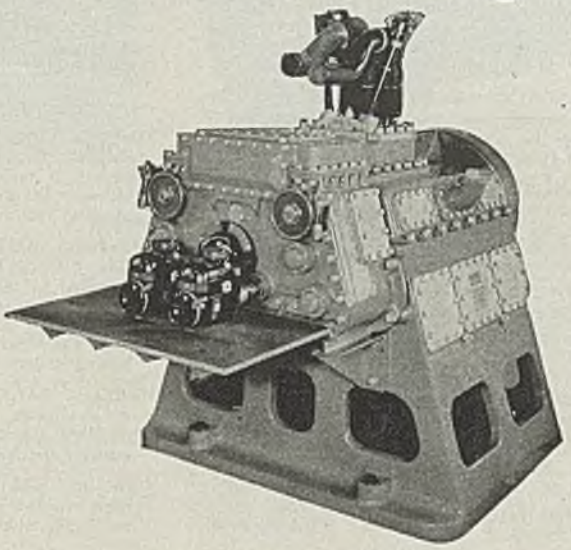

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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

BURBANK, CALIF.—Pacific Airmotive Corp., 6263 San Fernando Rd., has let contract for 200 x 250-foot warehouse to cost $75,000 to Buttress & McClellan, 1013 East Eighth St., Los Angeles. CPA approval has been granted.

GLENDALE, CALIF.—American Radiator & Standard Sanitary Corp., 2135 Atlantic St., Los Angeles, has received a building permit for construction of an office and warehouse at 5458 San Fernando Rd., which will be erected by Myers Bros., 3407 San Fernando Rd., at a cost of $190,000.

LOS ANGELES—California Metal Enameling Co., 6650 E. Slauson Ave., Bell Gardens, has awarded the contract for a one-story, 60 x 110 foot factory addition to cost $125,000 to H. F. Hendrickson Co., 2811 Clearwater St.

LOS ANGELES—Joseph T. Ryerson Inc., Chicago, is planning to build an additional crane bay to its new steel plant being erected on Bandini Blvd.

LOS ANGELES—Mission Appliance Co., 7101 McKinley Ave., has received a low bid of $449,847 from C. T. & W. P. Stover, 116 N. Alexander Ave., Claremont, for a one-story, 150 x 800 foot steel factory, spur track and loading canopies.

LOS ANGELES—C. Lefkowitz, c/o H. O. Olden, architect, 174 N. Canon Dr., Beverly Hills, Calif., has awarded contract for a three-story manufacturing plant to cost $100,000 to L. E. Dixon Co., 409 S. California St., San Gabriel, Calif.

PASADENA, CALIF.—Rheem Mfg. Co., New York, has started drawing up working drawings for a factory and laboratory building containing 15,000 sq. ft. of floor space. Wurdeman & Becket, 3757 Wilshire Blvd., Los Angeles, are architects.

REDONDO BEACH, CALIF.—Southern California Edison Co., 601 W. Fifth St., Los Angeles, has awarded the contract for design and construction of a 130 x 240 foot, 55 x 100 foot frame, brick steam plant, craneways, stacks, tanks etc. at Seventh and Hermosa Sts., to Stone & Webster Engineering Corp., 601 W. Fifth St., Los Angeles, for $1,837,000.

SAN GABRIEL, CALIF.—P. J. Landvogt, 528 H. Pasqual Ave., has awarded a contract to Jackson Bros., 3478 W. Eighth St., Los Angeles, for construction of a one-story, 100 x 150 foot factory at 800 W. Santa Anita Ave., to cost approximately $60,000.

SANTA MONICA, CALIF.—Bay District Pipe & Supply Co., 9430 Rayo Ave., South Gate, Calif., plans to construct a 60 x 81 foot warehouse building at 18th St. and Pico Blvd. to cost $15,000.

TORRANCE, CALIF. — Alloy Metal Abrasive Co., Ann Arbor, Mich., has obtained CPA approval to build a steel factory building at Jefferson St. and Vine Ave. Building will be 50 x 60 feet and will cost $28,000.

VENTURA, CALIF.—Southern Counties Gas Co., 810 S. Flower St., Los Angeles, has awarded a 100 x 40 foot plant addition and contract for remodeling its compressor station to cost $200,000 to OFFCO Construction Co. Inc., 2650 Cherry Ave., Long Beach, Calif.

VERNON, CALIF.—Owner, c/o A. C. Martin & Associates, 333 S. Beandry Ave., Los Angeles, plans construction of a steel industrial building to cost $200,000.

VERNON, CALIF.—Harvey Machine Co. has been granted a building permit for a factory on Pacific Blvd. near 46th St., which will be erected by Pozzo Construction Co., 2403 Riverside Dr., Los Angeles, at a cost of $117,000.

VERNON, CALIF. — Bethlehem Pacific Coast Steel Corp. plans construction of a steel frame soaking pit aisle at 3396 E. Slauson Ave. to cost $20,000 and a steel frame blooming mill, 90 x 660 feet, at 3391 E. Randolph St. to cost $90,000.

CONNECTICUT

STAMFORD, CONN.—Sterling Co. Inc., 72 Glenbrook Rd., has awarded contract for one and three-story, 100 x 110 foot, 40 x 90 foot, factory to Sanworth Hughes Co., 175 Market St., Paterson, N. J., for $100,000.

FLORIDA

TARPON SPRINGS, FLA.—Victor Chemical Co., W. B. Brown, vice president, 141 W. Jackson Ave., Chicago, has awarded contract for phosphate plant on Anclote river to Foster & Creighton Co., American National Bank Bldg., Nashville, Tenn., for $2,000,000.

ILLINOIS

BROOKFIELD, ILL.—Electro-Motive Corp., LaGrange, Ill., will award contracts soon for construction of a one-story power plant building and sewage disposal plant to cost approximately $500,000. Plans are being prepared by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago.

CHICAGO—John Amann & Sons, 5832 S. Green St., has awarded contract for construction of a one-story wire products factory to cost $95,000 to H. N. Samuels, 165 N. Wacker Dr.

INDIANA

GARY, IND.—Gary Pioneer Steel Corp., 2301 Industrial Blvd., has been organized to manufacture garden tools by Joseph Wiseman, Libby Simon and Maurice Simon.

HAMMOND, IND.—LaSalle Steel Co., 1412-150 St., has awarded contract for one-story 90 x 187 foot steel plant addition to Hughes-Foulkrod Co., 1505 Rose St., Philadelphia, to cost over $100,000. Theodore S. See, c/o owner, is engineer.

MICHIGAN

BAY CITY, MICH.—Specialty Products Division, Dow Chemical Co., has started construction of a $45,000 plant alteration and expansion.

BELLEVILLE, MICH.—Inland Shore Improvement Co., 44052 Yost Rd., has been organized with $50,000 capital to manufacture pile driving, dredging and dock building machinery by Nilarion Bibicoff Sr., 44100 Yost Rd.

DETROIT—American Metals Products Co., 5959 Linsdale Ave., is planning a metal products plant to cost $484,000, plans for which are being drawn by Giffels & Vallet Inc., L. Rossetti Associates, 1000 Marquette Bldg.

DETROIT—Prain Steel Corp., 15848 Second Blvd., has been organized to deal in steel and steel products by Joseph O. Prain, 15424 Pinehurst. Firm is capitalized at $100,000.

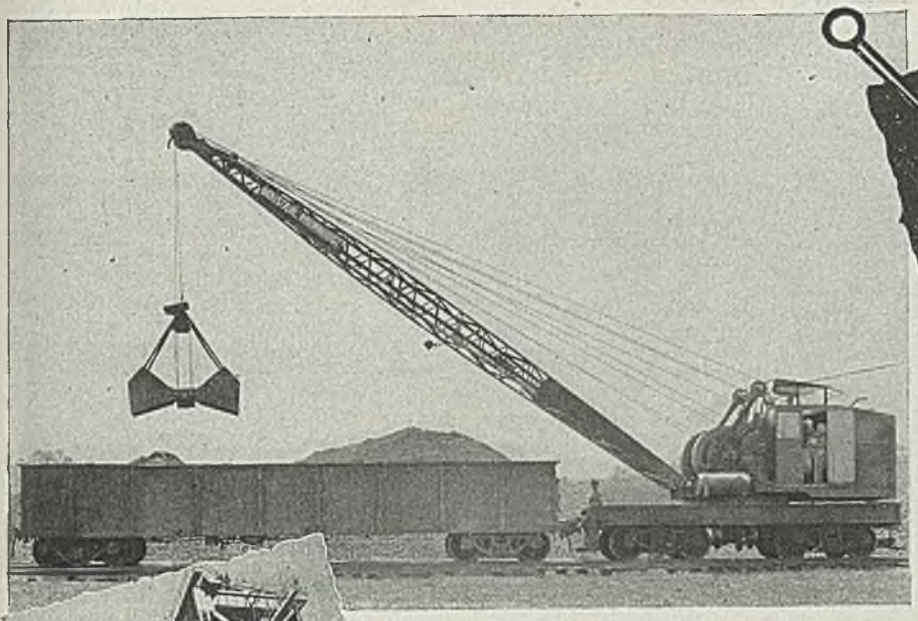
DETROIT—The LeTarte Co., 1536 Hurlburt, has been incorporated with $10,000 capital to manufacture tools, dies, jigs and fixtures by Joseph George LeTarte, 1535 Hurlburt.

DETROIT—Preston-Sanford Inc., 6630 East Canfield Ave., has been formed by Charles E. Sanford, same address, to manufacture pulleys, fan blades and machine products. Company is capitalized at $100,000.

DETROIT—Doss Steel Research Inc., 6510 E. McNichols, has been incorporated with $100,000 capital to manufacture tools, dies, etc., by Joseph H. Doss, 13417 Promenade Ave.

GRAND RAPIDS, MICH.—American Metal Finishing Co., 922 Grand Rapids National Bank Bldg., has been incorporated with $250,000 capital to do a general plating business by Neil DeYoung, same address.

GROSSE POINT WOODS, MICH. — Eslick Products Inc., 1312 Hawthorne Ave., has been organized with $50,000 capital to manu-



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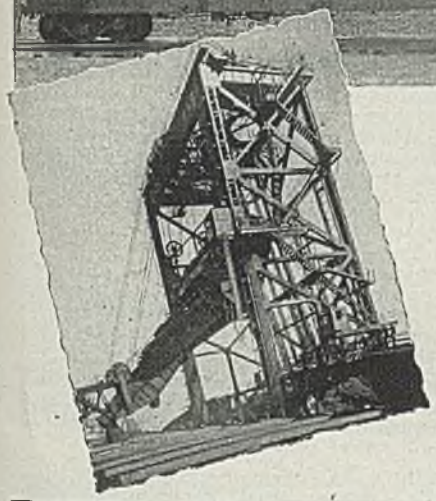

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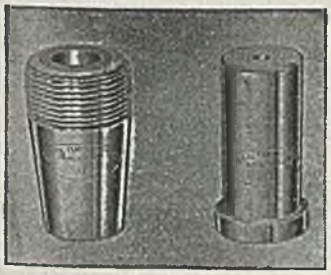

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facture hand and power driven tools by Arthur U. Eslick, 1898 Country Club Drive.

HIGHLAND PARK, MICH.—Perfect Seal Mfg. Co. Inc., 135 North St., has been organized by Arthur R. Kinish, same address, to manufacture weatherstrip products. Firm is capitalized at $45,000.

LINCOLN PARK, MICH.—Par Screw Products Co., 25900 West Outer Drive, has been organized with $25,000 capital to manufacture screw machine products by James W. Grady, 16152 Sussex Ave., Detroit.

MUSKEGON, MICH.—Muskegon Metal Products Inc., 3324 Thompson St., has been incorporated with $15,000 capital to manufacture stampings and machined products by Bert M. Wadkins, 1411 Bellum Rd., Ruddiman Terrace, Muskegon.

MISSOURI

ST. LOUIS—Metal Fabricators Inc., 1028 Frey Ave., has been incorporated by Charles Gauchat Jr., same address.

NEW JERSEY

NEW BRUNSWICK, N. J.—Zonite Products Corp., New York, has begun construction of a $300,000 addition. Walter Kidde Constructors Inc., New York, is the engineer and builder. The addition is one-story, 109 x 240 foot, except for a 40-foot section which will be two stories.

TRENTON, N. J.—Bayer Co., 175 Varick St., New York, has awarded contract for design and construction of a one and five-story acid recovery plant to cost $115,000 to The Austin Co., 19 Rector St., New York.

NORTH CAROLINA

FARMVILLE, N. C.—American Locomotive Works, Atlanta, has announced low bid on improvements for Section 1 at $122,250 was Westinghouse Electric Co., Atlanta.

OHIO

AKRON—Ohio Edison Co., 47 N. Main St., has plans to construct a $398,000 addition to its Beech St. steam heating plant. The building is estimated to cost $171,000 and the equipment, $227,000.

BELLEVUE, O.—National Farm Machinery Cooperative Inc. plans to build an addition to its forging department at an estimated cost of $69,709.

BRILLIANT, O.—Ohio Power Co., 305 Cleveland Ave., S. W., Canton, O., has plans for construction of a steam electric generator and additional transmission lines to cost $10,600,000.

CANTON, O.—Canton Elevator & Mfg. Co. has been organized by Lester E. Wolfe, 817 McKinley Ave., N.W., to manufacture passenger and freight elevators.

CLEVELAND—Reliable Tool & Die Co., 1927 E. 55th St., has been formed with $10,000 capital to manufacture tools, dies and machinery. Joseph Tornatzky is president.

CLEVELAND—American Coach & Body Co., 9503 Woodland Ave., has plans to erect and equip a building for manufacturing at a cost of $165,000. The company will also set up a subassembly plant costing $25,000 in Oakland, Calif.

CLEVELAND—The Mac-Car Tool Co., 1229 Carnegie Ave., has been incorporated to manufacture tools and dies. Francis Machura, 1432 Parkview Rd., Lyndhurst, O., and Raymond Otonicar, 1193 E. 169th St., are organizers.

LORAIN, O.—National Tube Co. has awarded contract for construction of a continuous seamless pipe mill to Aetna-Standard Engineering Co., Home Savings & Loan Bldg., Youngstown, to cost $1,000,000 or more.

MANSFIELD, O.—Stevens Mfg. Co. Inc., 3 N. Main St., has been formed with $10,000 capital to manufacture thermostatic and electrical devices. Walter C. Stevens, Edith E. Stevens and R. E. Hutchinson are incorporators.

NILES, O.—National Bearing Division, American Brake Shoe Co., with E. A. Williams, 4930 Manchester Ave., St. Louis 10, and 230 Park Ave., New York, as works manager, has contract pending for foundry and office.

PORT CLINTON, O.—Port Clinton Marine Co., 328 W. Perry St., is planning a one-story, 133 x 156 foot factory to cost $138,000.

TOLEDO, O.—Standard Oil Co. of Ohio, 3082 Broadway, Cleveland, has plans to build an $8,000,000 lubricating oil plant which will have a capacity of approximately 2000 barrels of lubricating oil daily.

TOLEDO, O.—E. I. duPont de Nemours & Co., Wilmington, Del., is planning to alter existing three-story, 64 x 130 foot plant on Tremainesville Rd. at a cost of $136,910.

TOLEDO, O. — Willys-Overland Motors Inc., Yost St., plans to remodel Bldg. No. 6 at a cost of $423,000.

TOLEDO, O.—Libbey Glass Division, Owens-Illinois Glass Co., Ash St., plans construction of a 28 x 100 x 240 foot warehouse, to cost $150,000; two-story, 100 x 240 foot factory, $240,000; 15 x 50 x 50 foot compressor building addition, $50,000; new column footings on present structures, $165,000; and other remodeling, $235,000.

PENNSYLVANIA

HARRISBURG, PA.—American Can Co., 230 Park Ave., New York, has awarded the contract for a one-story warehouse at Seventh and Division Sts. to Ritter Bros., 1511 N. Cameron St. for $230,000.

MEADVILLE, PA.—National Bearing Division, American Brake Shoe Co., New York, has begun construction of a $2 million plant which will replace present facilities here.

SHARON, PA.—Westinghouse Electric & Mfg. Co., Maloney Bldg., Pittsburgh, plans to construct a 40 x 118 foot, one-story factory at a cost of $200.000. L. C. Mechling, same address, is engineer.

SHARON, PA.—Westinghouse Electric Corp., Pittsburgh, plans construction and improvements to its plant at a cost of $2,000,000.

WILLOW GROVE, PA.—M. Liuzzi, 506 Lincoln Ave., has awarded separate contracts for a one and two-story manufacturing plant to cost $750,000.

TENNESSEE

KINGSPORT, TENN.—City receives bids Sept. 17 for water system, including cast iron pipe and fittings, gate valves, hydrants and traveling screens.

TEXAS

ALVIN, TEX.—Phillips Petroleum Co., N. Esperson Bldg., Houston, Tex., has plans to construct a gas distillate plant to cost $2,000,000.

DALLAS, TEX.—Dallas Power & Light Co. has city approval for a $3,270,000 expansion of its Mountain Creek generating plant which will include installation of a third generator of 30,000 kilowatts capacity.

DALLAS, TEX.—Holister Coil Spring Mfg. Co. has let contract to Blue Diamond Co., 2722 Logan, for three buildings, one 82 x 200 feet, and two 40 x 100 feet. Erection of steel plant buildings, estimated to cost $125,000. has been started. Blocker & Pundley, 2912½ Hall St., architects.

HOUSTON, TEX. — Asbestos Co. of Texas plans construction of a steel frame building, Hempstead Rd. at Post Oak Rd., to cost $380,000. Otis Massey is president.

WISCONSIN

SHEBOYGAN, WIS.—Wisconsin Oil Refining Co., Rt. 3, plans a refinery expansion to cost $575,000.

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20-Ton Northern 60' Span
20-Ton P&H 51'4" Span
20-Ton P&H 39'6" Span
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