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STEEL

ESTABLISHED 1882

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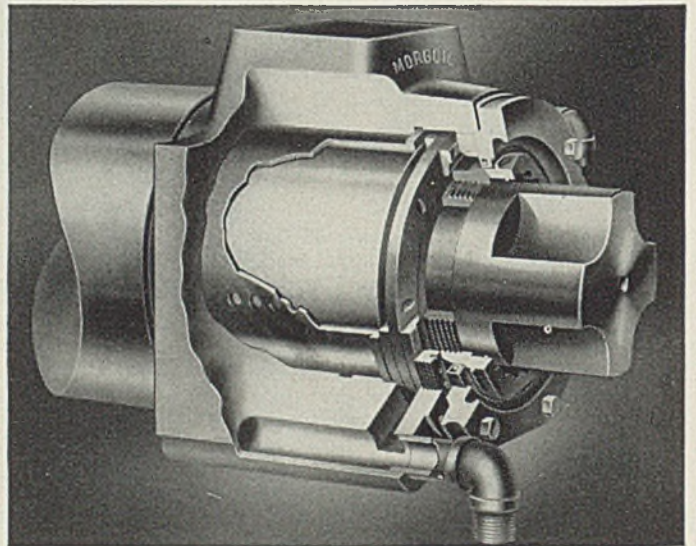
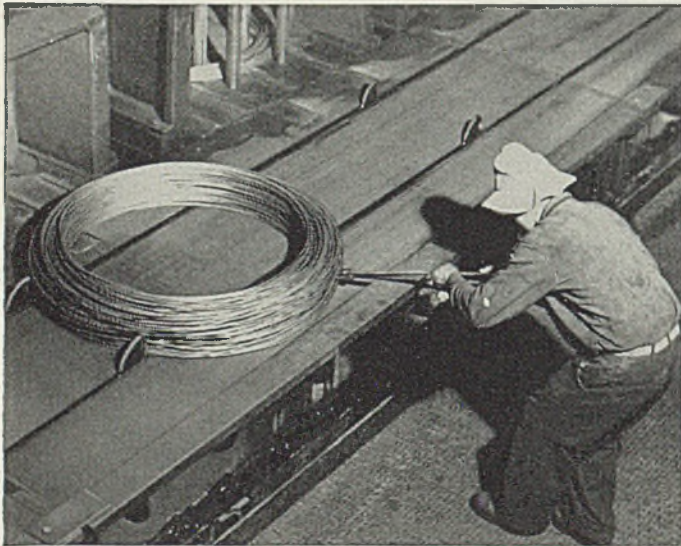
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Wrapping up your Troubles doesn't Solve them!

And these neat bundles are full of trouble. Each represents a shut-down measured in miles of steel which was never shipped because something went wrong.

A Morgan Report will help you locate the real bottle necks to better, faster production, and suggest practical answers.



Left: Laying and Pouring Reels as developed by Morgan embody the cumulative refinements of more than 40 years' engineering experience. They keep up with modern rod mills — in speed and in uniform quality of coils produced.

Right: Morgoil bearings ride on a film of oil. They offer extremely low coefficient of friction, high load capacity and freedom from wear. They are available in all capacities for replacement.



CONTINUOUS ROLLING MILLS
 Rod • Strip • Skelp • Merchant Shapes
MORGAN CONSTRUCTION COMPANY, WORCESTER, MASSACHUSETTS

HIGHLIGHTING THIS ISSUE

■ PIG IRON prices were advanced \$1 a ton last week (p. 89) by a leading merchant producer, who booked substantial tonnages at new levels for immediate and first quarter delivery. Other interests withdrew from the market temporarily, having little to sell, and awaiting developments. Notwithstanding the fact that the national average of steelworks operations (p. 25) eased one point to 95½ per cent, the dominant note of the market is its remarkably strong and stable character at a time of year when normally output, sales and shipments taper sharply. Incoming orders for steel still surpass shipments. . . . Scrap inventories have increased slightly (p. 38) and are sufficient for from 5 to 9-weeks' operations in most consuming districts.

• • •

Extension of the licensing system to ferro-alloys and certain iron and steel products (p. 31), is expected to have little effect on our exports, as most of our best foreign customers will be allowed to continue to buy. Export prices on some products have been advanced. . . . The

Licensing Extended

steel industry can supply 75 per cent of the raw materials necessary for a year's peak operations, reports the American Iron and Steel institute (p. 26). Most of the other materials can be purchased from domestic sources, and only ½ of 1 per cent need to be imported. Steelmaking capacity will be increased nearly 1,000,000 net tons in 1940 by the construction of 21 new electric furnaces.

• • •

The rearmament program is bogging down, according to reports (p. 19) to the Congress of Industry. . . . New Deal economists are warning major expansions will be required (p. 43) to satisfy demands arising from an anticipated increase in consumer income, but Col. Leonard P. Ayres, distinguished economist called to serve the government, while predicting boom conditions (p. 33) cautions against over-expansion.

Rearmament Lagging

. . . Welding in aircraft construction may gain as much as 400 per cent (p. 35). Its increased use in defense industries is creating a serious problem for power companies. . . . Federal and uniform regulation of motor freight carriers in interstate commerce (p. 41) is being pushed on the basis it would aid national defense.

• • •

According to Mr. Jacobs (p. 48), wide differences of opinion exist as to what constitutes efficiency in production involving cylindrical grinding. He describes pertinent factors pertaining to

Crane Hazards

quantity production of cylindrical work on center-type machines, also advantages of both straight-line production and the grouping of grinders in one department. . . . The greatest hazard of the overhead traveling crane is boarding and leaving it, says Victor Schlossberg (p. 50). Persons other than cranemen should keep off entirely. He includes tips on how to overcome various everyday dangers. . . . Flame gouging is a good substitute for chipping on welds and is easily learned, according to Harold Lawrence, (p. 54).

• • •

Developed only a short while ago, the speed nut (p. 58), speeds assemblies of automobiles by replacing two parts and frequently as many as five. . . . In describing the

Wrinkle Finishes

topping boiler system (p. 64) used by Weirton Steel Co., J. W. Vicary says an appreciable increase in generated power can be developed for only a slight increase in fuel consumption. . . . Although wrinkle finishes cannot be striped or otherwise ornamented (p. 68) they are economical to apply. . . . In his concluding article on efficient handling (p. 76), E. J. Mills explains how losses charged to "damage in transit" were cut as much as 75 per cent at his plant by the use of pallets, metal containers and other methods suitable for the diversified products handled.



Airplane View of the Principal Plant of Inland Steel Company

This aerial photograph, taken at an altitude of 1,000 feet, shows the Indiana Harbor Works, on the south shore of Lake Michigan. The No. 1 unit, and the administration building, are in the foreground. Across the tracks is the No. 2 unit with the 76-in. and the new 44-in. continuous sheet and strip mills at the right. The capacity of this modern plant has been increased 40 per cent in the last eight years.

Industry Renews Pledge of Full Aid to Defense Program

Finds National Rearmament Plan Is Bogging Down.

Clearer Definition of Objectives Held Necessary.

More Authority for Defense Commission Urged.

Bulk of Cost Should Be Met from Current Income.

NEW YORK

■ THE DEFENSE program is going badly, and something should be done about it without delay.

This, essentially, was the dominant concern among thousands of manufacturers who attended the forty-fifth Congress of American Industry, here last week under the sponsorship of the National Association of Manufacturers. Numerous speakers expressed this feeling in formal addresses. Many manufacturers talked informally with each other to the same effect.

Fear that the defense program is lagging dangerously was the principal point in the address of the outgoing president, H. W. Prentis Jr., president, Armstrong Cork Co., Lancaster, Pa.

"To speak candidly and not in a spirit of carping criticism," he said, "industry today is deeply concerned over the failure of government to develop those essential policies that experience in the World war indicated are imperative if our objective of production, more production and still more production, is to be speedily attained.

Need Definition of Objectives

"First and foremost, there is lacking a clear definition of our defense objectives: What do we intend to protect? To what extent is the government proposing ultimately to reach out beyond those physical areas in which our national interests are directly at stake?

"Despite the splendid work that has been done by the members of the national defense advisory commission and the patriotic public servants who man the army and navy departments, industry is deeply concerned, moreover, about the lack of general co-ordination, the lack of delegated authority, the lack of long-range planning, which is not only essential to defense but

also is urgently needed to guard against the inevitable aftermath of the present armament boom."

Mr. Prentis declared that to date the responsibility placed upon the production member of the defense commission has been far less than the public generally has been led to believe. He has been given only the authority to "approve" contracts for materials and equipment placed by the military services, and no authority to follow through.

"The prime necessity today is the centralization of authority somewhere to expedite the determination by the responsible military and naval agencies of their respective defense needs. Thereafter, full responsibility for the production of

needed equipment and material should be lodged in the defense commission. It is that sort of established authority that the public looked for when the commission was named; it is that sort of organization on which defense depends."

General Hugh S. Johnson also complained, saying that the manner in which American industrial mobilization clicked so satisfactorily in 1918 has become a model for most of the world—but not for us.

"If you compare our effort since the beginning of the overwhelming German offensive westward with our effort after our 1917 declaration of war then, in any true mobilization of our industry, we have made no more speed in 1940 than in 1917.

Fuller New President of Manufacturers' Group



■ Walter D. Fuller, center, president, Curtis Publishing Co., Philadelphia, and new president, National Association of Manufacturers, chats with B. C. Heacock, left, president, Caterpillar Tractor Co., Peoria, Ill., and John C. Gall, N.A.M. counsel, at the association's meeting in New York last week

From the 1917 timid creation of an advisory defense commission without either 'responsibility or authority,' throughout months of 1917 fumbling and delay, we have repeated the same blunders and taken heed of very few of those hard-won lessons," he stated.

"Without going into too much detail, and speaking as a veteran of that earlier effort, I say to you that the progress of the present day American industrial mobilization to date is wholly unsatisfactory. No matter what Pollyanna official reports may come to you, the output of defensive material for either ourselves or for Great Britain is wholly inadequate and entirely too slow.

"On the basis of those conclusions, I warn you in all earnestness that if this situation cannot be promptly remedied, this country—and especially its industry—is in immediate danger of experimental, radical and revolutionary tinkering. It may or may not produce an improvement in production. I think it will produce none. But it will leave our American capitalist and profits system of free enterprise in such a strait-jacket that none of the industrialists of this generation will ever be able to recognize it again.

"Already this is being said in Washington: 'Industry had its chance—under the leadership of Knudsen and Stettinius. It didn't

respond. The industrialists on the advisory commission were too tender of the sensibilities of their old industrial friends. This is war. New authorities must be given. We must have, in the driver's seat, men not so close to industry and closer to the people.' That is what is said. What it means is command of industry by the New Deal type of administrator, with very great powers and without industrial experience.

"Something even more dangerous is being said, something like this: 'Like England, we never can get the extreme effort required without getting into the war. In that way alone can powers be granted,

Steel Sufficient for Defense, British, Normal Needs

■ IS THE STEEL industry in the United States able to supply the defense needs of a three-year program, our normal needs and the needs of England without a substantial increase of productive capacity?

This question, one of the most important before the steel industry, was assigned, at the round table discussion, to Charles R. Hook, president, American Rolling Mill Co., Middletown, O.

"There are three parts to the question," replied Mr. Hook. "First, there can be no possible question of a shortage of steel for armaments in connection with our domestic defense program, because existing annual steel capacity is more than ten times the annual requirements for defense program needs, according to the most generous estimates of those needs.

"Second, as regards the needs of our British friends, the answer is similar, because existing steel capacity in this country is more than five times the combined requirements for our own defense program and the needs of Great Britain, as those British needs are now reported to us.

"Third, if there has been any difference of opinion regarding the ability of the steel industry in the United States to supply all needs, it has not been over the question of our own national defense program or full aid to Great Britain. Those who are insisting that a considerable increase in steel capacity is necessary are thinking only about possible consumption for domestic civilian requirements. What those may amount to is largely a matter of conjecture.

"On the basis of all past experience there is enough steelmaking capacity to take care of those civ-

ilian requirements, in addition to covering the needs of the defense program. Great Britain's buying of steel products is done in an orderly manner, and the available steel supply is properly distributed.

"Most of the advocates of greatly increased steelmaking capacity approach the subject on theoretical grounds and reach their conclu-



Charles R. Hook

sions from premises which I do not believe are sound. Let me give a few figures to illustrate my answers.

"Total producing capacity of the steel industry in this country is now at least 83,000,000 tons of ingots a year. And that figure will be upped during 1941.

"According to the best estimates, our national defense program as now planned will not take more than 6,000,000 tons of ingots in the maximum year, probably 1942. The British program, including Canada, is now on a basis which calls for about 10,000,000 tons of ingots per

year. Add to that 2,500,000 tons for other exports, to nonbelligerent markets.

"The aggregate of those three items is not over 18,500,000 tons of ingots in any year.

"There is left, then, out of the total capacity 64,000,000 tons, or about 4,000,000 tons in excess of what all domestic civilian demands amounted to in the speculative fever of 1929. And I think you will agree that a lot of the 1929 buying was in excess of immediate needs."

Mr. Hook was questioned as to whether, in his opinion, maximum defense production could be achieved without curtailing output of peace-time consumption goods. He said that if the defense advisory commission were given power and a chairman there would be very little need for curtailing production of consumption goods—with the possible exception of some semidurable goods industries, where the transfer of large numbers of highly skilled men from domestic goods to munitions is required before other men can be trained to take their places.

In reply to a question as to hours of labor Mr. Hook thought it would be to the general good to revise the present ceiling and allow employers to employ all groups of labor up to 44 hours a week before it becomes necessary to pay overtime. This would hold down costs and tend to increase production.

Mr. Hook believes that private industry should furnish to the limit of its ability the money needed to finance expansion needed to execute defense orders. Where the facilities will be of no value to industry for the production of domestic goods after the emergency, he thought it proper and advisable to use government funds.

selfish interests submerged, extreme effort attained."

The sad truth of the matter, General Johnson concluded, seems to be that our government does not sufficiently trust industry to give it the means, the authority and the leeway for all-out defense. "I am

quite sure," he said, "that it does not yet understand the solution of this problem as it was learned in 1918. Until it does understand and move in these directions progress may be made but it will be too slow. If it would only so move we could astonish the world."

justed in accordance with the needs of government but the character of the taxation, the methods of ascertaining liability, the procedure of levy and collection should be codified and made permanent and certain, with manifest benefit to taxpayer and government alike."

In another portion of his address Mr. Prentis, in commenting on the association's relations with the various departments of government, asked this question: Who is so well equipped as organized business to help government modernize its methods and catch up, so to speak, with the efficient procedures used in private enterprise?

"Until congress sees fit to establish a research department to explore the facts before enacting statutes, should not patriotic business men try to perform that function? Private business accounting systems and commercial budget-making in the field of government would bring closer the day when the federal income and outgo can be balanced and the haunting fear of ultimate chaos eliminated.

Favors Increased Taxation

Dr. Harley Lutz, professor of economics, Princeton university, Princeton, N. J., saying that curtailment of peace-time production is inevitable when defense production moves to a peak, held that price increases would tend to be held down provided a sound method is used in financing the armament program. He favors increased taxation and the compulsory purchase of "baby" bonds—provided that the bonds could not be sold or used as collateral in borrowing money. That would leave the taxpayer and bond purchaser with less money with which to purchase goods. Financing of the program largely on borrowed money would have inflationary effects.

An examination of the budget estimates published Aug. 5 reveals a rather discouraging prospect for reduction of expenditures, said Dr. Lutz. The amount actually spent on defense in the fiscal year 1941 may exceed five billions. The only place in which any cutting can be done is in the nonmandatory items, unless it be decided that some part of the sacrifice shall be borne also by the beneficiaries of the government, expenditures for whom constitute a moral commitment. The great bulk of the nonmandatory expenditures is for aids and relief. These items total, together with general public works, \$3,451,000,000 for the fiscal year 1941. This amount, he said, can and should be cut deeply but no amount of pruning that will be done will suffice to wipe out the deficit.

This same pessimistic attitude with respect to any real reduction

Armament Program Cost To Be Tremendous, Possibly as High as 100 Billion Dollars. Burden Will Fall Heavily on Every American.

N.A.M. Advocates Ordinary Government Expenses Be Cut Deeply.

■ WHAT is the armament program going to cost? Consensus was that the cost will be enormous—that only the surface has been scratched so far. Estimates as high as 100 billion dollars were expressed by some speakers. Hence another question on which much attention was focused: How will the necessary money be raised?

"Sacrifices will be required on everybody's part," said Mr. Prentis in his report. "A good many of us, I suspect, have been hoping against hope that the burden would not fall very heavily on us individually. Every American needs to get that idea out of his mind forthwith. The financial burden is going to be enormous.

"Hence the National Association of Manufacturers urges: First, that

the ordinary expenses of government, federal, state and local, be curbed at every possible point; second, that sound provisions be made for new revenue for defense purposes; third, that every feasible step be taken to encourage the use of private capital in defense industries; fourth, that the development of new enterprises that serve peacetime needs be encouraged to as great a degree as is consistent with the defense program.

"In this connection industry earnestly recommends an immediate beginning on the task of codification and simplification of our tax laws. The ultimate object should be to establish a permanent system of taxes based on a foundation on which business can rely. From time to time the rates should be ad-

Medallion Symbolizes American Way of Life



■ Commemorating the National Association of Manufacturers' 1940 campaign to further understanding of private enterprise and its indispensability to the American way of life, copies of this medallion were distributed to industrial leaders who attended the Congress of Industry in New York last week.

On the obverse face of the medallion is shown the structure of freedom—a tripod supported by the three shafts of representative democracy, civil and religious liberty and free private enterprise. Be-

neath are figures symbolic of workers, agriculturists, women, children, all of those who share the blessings of this freedom.

On the reverse face, these three great institutions of freedom are depicted. Representative democracy is symbolized by the capitol dome and a ballot box; civil and religious liberty by the school, church, printing press and the free assembly of citizens; and man's right to search, to build, to invent, to work as he pleases, symbolized in the smoke plumes of industry.

in government expenditures was voiced by other speakers who touched on the subject—hence the

prevailing opinion was that taxes are due to mount higher and higher.

Elimination of New Models or New Products Not Necessary at Present Stage of Defense Program. Compulsory Arbitration of Wage and Hour Disputes Might Have Undesirable Results.

■ FOR THE duration of the war period, should we eliminate the introduction of new models, as in automobiles and radios, or of completely new products?

This question, widely asked by manufacturers of late, was assigned to Donaldson Brown, vice chairman, General Motors Corp., New York.

"We will have to forget 'business as usual' when and if 'business as usual' would impede progress in the defense program," said Mr. Brown. "However, to depart from industrial practices proven to be economically sound, just for the sake of appearing to be doing something in the interests of the defense program, could be a tragic error. Failure to introduce available new and improved products within any industry might result, from its effect on consumer demand, in serious unemployment in factories as well as throughout distributing and merchandising channels.

"Clearly, such risk of dislocation with its attendant burden upon the national economy should not be incurred until knowledge exists that there will be a shortage of tools or labor necessary to the model change, or until it becomes obvious that a shortage of materials, or other limitation, will cut down production to a level below the rate of demand in any event, in which case any stimulus from introduction of new models would be fruitless.

"Specifically, my answer to the

question is that the defense program is not sufficiently advanced as yet to cause any arbitrary abandonment of plans for new model introduction."

Asked whether compulsory arbitration of wage and hour disputes should be introduced, Mr. Brown replied:

"I do not believe it is desirable to impose compulsory arbitration of wage and hour disputes. There should be the opportunity and ability for the employer and the employes, through whatever method exists—collective bargaining, or otherwise—to reconcile differences and arrive at a sound solution of difficulties which may arise.

Favors Right To Strike

"Management, on the one hand, has responsibilities which cannot be passed on to a disinterested party. Labor, for its part, has the right to contend for what it wants and to press its demands without interference from someone who cannot know as well as the contending parties what it is all about. . . .

"If the parties concerned cannot get together upon a sound and sensible conclusion it is too bad. Of course, the question is posed in the light of our defense needs, and in recognition of the fact that the country will not tolerate interferences with production because of wage and hour disputes.

"My answer, nevertheless, is that

I would hold to the principle of the right to strike. If a strike occurs under the conditions existing it will be because of narrowness or ignorance on the part of one side or the other in the dispute. I would be quite content to rely upon the force of public opinion to whip the recalcitrant member—on whichever side—into line. I don't think we need fear any serious stoppage of production."

Mr. Brown supplied an interesting answer to still another question which has been raised: Is it more efficient to establish new plants in new localities or to enlarge existing plants for the production of defense materials?

"Nothing could be more unfortunate for the long pull than for the location of armament plants to be determined as a consequence of political pressures," he said. The first essential, if we are to proceed to the greatest effectiveness in the defense program, is to recognize the need for efficient management. Management is one of our bottlenecks. We must take advantage of every opportunity to utilize existing organization and management in the undertaking of armament production.

"This means that the required armament plants, wherever there is adequate labor available, should be established adjacent to or nearby existing plants, so that the existing management can take on the responsibility of supervision and operation in addition to the supervision and operation it is now exercising, or so as to permit any required transfer of this management function from one operation to the other.

"Of course, if circumstances permit the taking on of armament business, merely by enlargement of the existing plant, this would extend the maximum advantage from the standpoint of integration of management.

"Along with this question of man-



**Steel "Igloo" Shelters
British Policeman**

■ Comparative safety for this military policeman and his bulldog mascot is provided by a steel igloo-type air raid shelter in an English south coast town. Acme photo



agement integration is the question of availability of labor supply, in which regard the immobility of labor necessarily is to be considered. We cannot move labor back and forth from one point to another as though we were spotting freight cars here and there to the points of their greatest serviceability. Human beings are attached to their homes and their surroundings and it is impossible to expect that men with families should be called upon to move from where they are to some distant point in exact conformity with the shifts which might take place in opportunities for employment.

"The ideal would be to locate armament plants in communities where available labor already exists or where labor may become available as needed, resulting from foreseen necessary curtailment in employment on peacetime production. This would assure the maximum opportunity for full and continuing employment during the emergency and, furthermore, would facilitate the eventual transfer back to expanded employment on peacetime production when the emergency is over."

Important Advances During Emergency Are Probable

■ IS IT LIKELY that research and experimentation will yield important results in the present emergency, keeping in mind that mass production demands the "freezing" of design instead of constant change?

This question was asked Conway P. Coe, commissioner, United States patent office, Washington.

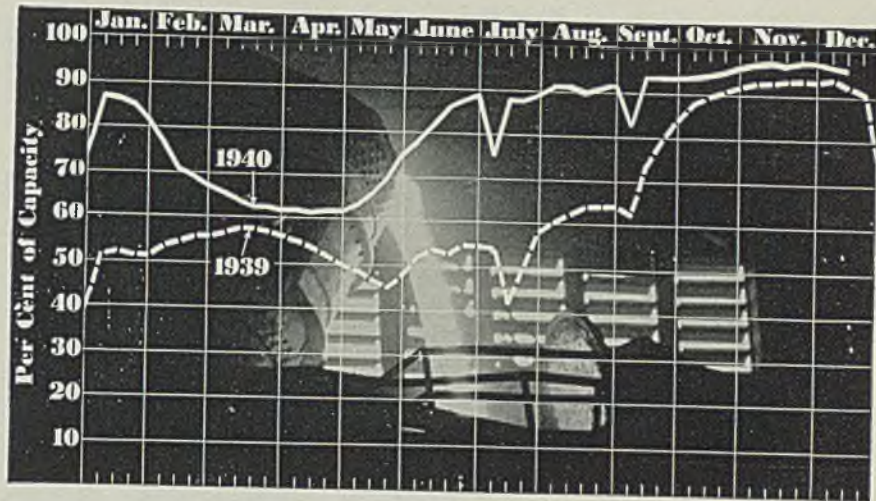
"The answer is yes and no," he said. "In many cases it will be possible to substitute new inventions and discoveries without in any way interfering with quantity production.

"In other cases the 'freezing' of design for production will demand that some new developments be postponed. That means that a balanced research program must contemplate both immediate needs and long-range planning. Although the war has been of comparatively short duration, many new inventions unknown at the outbreak of hostilities have been brought into use both by Great Britain and Germany.

Likewise, there are many others in process of development which will be brought into play only if hostilities continue.

"If civilization, as the world has known it heretofore, is to endure, science must devise an invention or a series of inventions to make an airplane useless as an aggressive weapon, so that it will be impossible

(Please turn to Page 108)



PRODUCTION... Down

■ STEELWORKS operations last week receded 1 point to 95½ per cent as furnace repair became necessary at several points. One district made an increase, four were lower and seven were unchanged. A year ago the rate was 92½ per cent; two years ago it was 58 per cent.

Detroit—With three open hearths idle for repair the rate remains steady at 90 per cent.

St. Louis—Holding at 87½ per cent for the fourth consecutive week, production is expected to maintain this rate until the Christmas holiday.

Birmingham, Ala.—Removal of one open hearth for repair caused a drop of 3 points to 97 per cent. Return to 100 per cent is expected this week.

Cincinnati—Unchanged at 87 per cent with this week's schedule at the same level.

Buffalo—Although two producers made shifts in furnaces the rate held at 93 per cent.

Pittsburgh—Loss of 1 point to 96 per cent resulted from curtailment for repair.

Wheeling—For the third consecutive week production holds at 98½ per cent.

Central eastern seaboard—With all producers operating all available equipment the rate was steady at 95 per cent.

New England—Completion of furnace repairs brought an increase of 15 points to 90 per cent. Two producers are operating all open hearths.

Cleveland—One open hearth taken off for repair caused a loss of 4 points to 86½ per cent. Rebound is expected this week.

Chicago—Down 1½ points to 98 per cent as several furnaces were taken off for reconditioning.

Youngstown, O.—Production last week remained at 92 per cent with schedule for this week at the same level. Active equipment includes 71 open hearths and three bessemeres. Campbell blast furnace of Youngstown Sheet & Tube Co. will be blown in this week after rebuilding.

100 Manufacturers Show Wares at Chemical Expo

■ National Chemical exposition in the Stevens hotel, Chicago, Dec. 11-15, included displays by 100 manufacturers. First exposition of its kind in Chicago, it was sponsored by the Chicago section, American Chemical society.

Among exhibitors were several well-known manufacturers of rolled and cast corrosion and acid-resisting steels and alloys; tanks, pumps and valves; materials handling equipment; dust control machinery, etc.

An Industrial Chemical conference conducted during the exposition comprised five sessions dealing with current chemical problems.

District Steel Rates

	Percentage of Ingot Capacity Engaged		Same week
	In Leading Districts		
	Week ended Dec. 14	Change	
Pittsburgh	96	- 1	93 41
Chicago	98	- 1.5	92.5 60
Eastern Pa.	95	None	88 37
Youngstown	92	None	93 56
Wheeling	93.5	None	85 62
Cleveland	86.5	- 4	90 59
Buffalo	93	None	90 44
Birmingham	97	- 3	94 82
New England	90	+15	93 70
Cincinnati	87	None	69 75
St. Louis	87.5	None	85 51.5
Detroit	90	None	94 89
Average	95.5	- 1	92.5 58

Steelmaking Capacity Increased

By 21 New Electric Furnaces

■ CONSTRUCTION of 21 new electric furnaces, most of which are already operating or will be by the first of the year, has been announced by the American Iron and Steel institute. All are expected to be in production early in 1941.

Programs which have been announced for increasing the industry's capacity in other directions are proceeding rapidly, and most of the new equipment is expected to be ready for operation some time next year.

Total capacity of the new electric furnaces is estimated to be at least 900,000 net tons of steel ingots per year.

Approximately 1,300,000 tons of additional capacity for producing open-hearth steel will be added as a result of the programs now underway.

The steel industry has been steadily expanding its electric furnace capacity over a period of years as the result of increasing demand for high grade steels. This demand has been accelerated by the defense program's need for greater production

of aircraft engines, light armor plate, gun parts, and other types of products in which electric furnace steels are preferred.

STEEL INDUSTRY SUPPLIES 75% OF OWN RAW MATERIALS

American steel industry itself can supply approximately 75 per cent of the tonnage of raw materials which it consumes in a year of peak operations, and can purchase from domestic sources all but a fraction of its remaining raw material needs, it is revealed by reports furnished to the American Iron and Steel institute by a group of companies representing nearly 95 per cent of the industry's steelmaking capacity.

Foreign sources of supply are required for less than 1/2 of 1 per cent of the total tonnage of raw materials consumed annually.

Those materials which must be purchased abroad, however, are essential in steel operations and no adequate substitutes or domestic sources have yet been developed. Included in the raw materials which

must be imported are manganese, tin, palm oil, certain heat-resisting materials, and some metals used in alloy steels.

The accompanying table shows the tonnages and sources of supply of some of the major raw materials which would be required annually when the steel industry operates at maximum capacity.

\$247,000,000 Spent for Steel Mill Upkeep in 1939

■ The steel industry spent approximately \$247,000,000 for repairs and maintenance during 1939, according to the American Iron and Steel institute.

Wages represented the largest single item; others of importance were the cost of supplies, and the freight charges on supplies purchased.

Repair and maintenance costs in 1939 were about 45 per cent higher than the total of \$171,000,000 spent for those purposes in 1938 and were close to the total of \$260,000,000 spent in 1937.

The cost of plant upkeep in 1939 was equivalent to about \$6.30 per net ton of finished steel produced during the year, compared with about \$7.10 per net ton in each of the two preceding years. In all three years, repair and maintenance costs represented about 9 per cent of revenue from sales.

Raw Materials for Capacity Steel Operations

Material	Net tons needed yearly at maximum operation	Per Cent obtainable from—		
		Steel Industry	Other domestic sources	Foreign sources
Iron ore	95,318,000	80	20	...
Coal	80,316,000	75	25	...
Limestone	25,055,000	53	47	...
Scrap	41,437,000	58	42	...
Manganese ore	1,506,000	..	..	100
Fuel oil	5,236,000	..	100	...
Refractories	3,760,000	2	97	1
Ferroalloys	1,112,000	48	48	4
Other nonferrous metals	399,000	21	54	25

Association Approves 73 New Standards

■ Seventy-three new standards adopted in the past year were approved at the annual meeting of the American Standards association, Hotel Astor, New York, Dec. 11. Among standards adopted and approved were items in mechanical and electrical fields, gas appliances, safety codes and others covering various materials. Organization's attention was also directed to many problems of standardization arising from efforts to expedite the defense program.

R. E. Zimmerman, vice president, United States Steel Corp., New York, was elected president, succeeding Edmund A. Prentis, of Spencer, White & Prentis. R. P. Anderson, American Petroleum institute, was re-elected chairman of the association's standard council.

National defense program, reported Mr. Prentis, has high-lighted almost all standardization work in the mechanical field the past year. One problem of the future, he said, would be to accelerate procedure on undertakings most urgently needed in defense, including work on screw threads, bolts, nuts and wrench openings, on machine pins, on wire and metal gages and on the fit of machine parts.



■ Holiday packaging and wrapping are far from new in many consumer markets. Yet the American Rolling Mill Co.'s Christmas placard, now appearing on every shipment of its iron, steel and stainless steel sheets, probably is a "first" so far as the heavy industries go. The placard is 10 x 14 inches, in red and green, and displays a holly wreath with the legend: "The Season's Greetings — ARMCO."

MEN of INDUSTRY

■ LEON F. PAYNE has been elected treasurer, Carnegie-Illinois Steel Corp., Pittsburgh. He succeeds Frank C. Harper, who retired Dec. 16 upon completion of approximately 32 years' service with the United States Steel Corp. subsidiary.

A graduate of Brown university in 1907, Mr. Payne became a salesman for Carnegie Steel Co. at Pittsburgh in 1909; a year later was transferred to the credit department and in 1913 was named assistant credit manager. He was credit manager from 1918 to 1929 when he was elected vice president, treasurer and a director of Oil Well Supply Co., a corporation subsidiary. Since 1932 he has served in that capacity at Dallas, Tex.

Mr. Harper became assistant secretary and assistant treasurer of the former American Sheet & Tin Plate Co. in February, 1909. He was secretary-treasurer of that company from May, 1931, to January, 1935, when he was named vice president and general manager of sales. Since consolidation of Sheet & Tin Plate with Carnegie-Illinois in June, 1936, he served as treasurer.

W. K. Hanna has been named manager, Pittsburgh territory, John A. Roebling's Sons Co., Trenton, N. J., which includes western Pennsylvania and certain areas in Maryland, Virginia, West Virginia and Kentucky. He joined the company in August, 1919.

Horace E. Thorn has been named manager of the company's Philadelphia branch office. After graduating from Drexel institute in 1912, Mr. Thorn joined Roebling and worked several years in the engineering department as designer and draftsman. In 1917 he was transferred to the sales department as sales agent.

Irvin A. Ruder has been placed in charge of the merchant iron and steel department, Iron & Steel Products Inc., Chicago, dealer in used iron and steel.

H. O. Ward, identified with automobile advertising the past 16 years, has been appointed advertising manager, Hudson Motor Car Co., Detroit.

Edward A. Phoenix, assistant sales promotion manager in charge of industrial products for Johns-Manville Sales Corp., New York,



W. K. Hanna



Horace E. Thorn



Norbert K. Koebel

Newly appointed research director, Lindberg Engineering Co., Chicago, as noted in STEEL, Nov. 18, p. 27

was honored Dec. 3 at a luncheon in Hotel Commodore, New York, which marked his completion of 25 years of service with the organiza-

tion. Lewis H. Brown, president of Johns-Manville, presented Mr. Phoenix with a gold watch, emblematic of membership in the J-M Quarter Century club, while colleagues gave him a gold watch chain, fob and scroll.

M. C. Pecsok, associated with the Osborn Mfg. Co., Cleveland, since 1912, has been appointed sales manager, brush division.

Guy Nonenmacher, associated with the late Walter P. Chrysler 28 years, has been appointed special assistant to the president of Chrysler Corp., Detroit.

H. E. Ardahl, formerly associated with John Deere Tractor Works, Waterloo, Iowa, has been made assistant to vice president, Michiana Products Corp., Michigan City, Ind.

George R. Sylvester, formerly chief engineer, Allied Engineering Co., has joined Ajax Electric Co. Inc., Philadelphia, as technical advisor.

Robert F. Ruggles, heretofore eastern district manager, Autovent Fan & Blower Co., Chicago, has been appointed general sales manager, with offices at Chicago.

T. T. Watson, development and service metallurgist, Lukens Steel Co., Coatesville, Pa., since 1934, has been appointed research metallurgist in charge of all plant research.

W. F. Bender, formerly associated with United States Rubber Co., New York, has been named chief engineer in charge of engineering and sales, Sauerisen Cements Co., Pittsburgh.

Forman H. Craton has been named section head, industrial haulage section of General Electric Co.'s transportation department, Erie, Pa. He has been associated with General Electric since 1924.

C. E. Wilson, acting president, General Motors Corp., Detroit, announced the following changes effective immediately:

B. D. Kunkle to be vice president in charge of personnel; F. O. Tanner to be vice president in charge of manufacturing; W. C. Williams Jr. to be vice president in charge

of accessory divisions; L. C. Goad, general manager of AC Spark Plug division at Flint, Mich., will be transferred to Detroit as assistant to Mr. Williams, while George Mann Jr., becomes general manager of AC Spark Plug division, succeeding Mr. Goad.

E. A. France Jr., with Cleveland office of Standard Statistics Inc., has secured a year's leave of absence to join the national defense advisory commission, Washington. Mr. France formerly was a member of STEEL's editorial staff.

Peter Altman has resigned as professor of aeronautics and head of the aeronautical engineering department, University of Detroit, to become associated with Aviation Mfg. Corp., research and development division, Williamsport, Pa.

John Ekern Ott, associated with Acme Steel Co., Chicago, 18 years, has been named manager of the Archer plant, where he will be in charge of production, warehousing, shipping, maintenance and engineering. W. C. Childress, formerly in charge of production and engi-



John Ekern Ott

neering at the Archer plant, has resigned.

W. H. Feldmann, vice president in charge of sales since 1937, has been elected general manager, Electric Machinery Mfg. Co., Minneapolis. Mr. Feldmann has been associated with the company 18 years, having been in charge of district sales at Cleveland and Chicago before his appointment as general

sales manager in 1927. He was elected a director in 1936.

David C. Arthurs, heretofore president, Mount Vernon Car Mfg. Co., Mount Vernon, Ill., has become chairman of the board. Walter Weiland, vice president, has been named president, and L. G. Sever continues as executive vice president.

Arthur W. Steudel, vice president and general manager, has been elected president, Sherwin-Williams Co., Cleveland. He succeeds George A. Martin who has become chairman of the board.

J. Hal Marshall has been appointed a sales representative in the Buffalo district by Jessop Steel Co. His headquarters will be at 130 Groveland avenue, Buffalo. Mr. Marshall was formerly employed in the sales department, composite steel division, at the company's general office in Washington, Pa.

Ralph W. Stahl, located in the Chicago territory as service engineer the past year and a half for Lindberg Engineering Co., Chicago, has been advanced to manager of the company's newly opened office at Indianapolis. The new office serves the Indiana, Kentucky, Tennessee and southern Ohio area and is located in the K. of P. building.

L. D. Tenerelli, Newark, N. J., has been elected president, Superior Iron Works, Superior, Wis., recently acquired as a subsidiary by Lidgerwood Mfg. Co., Elizabeth, N. J. Other officers chosen are: First vice president, W. S. Schalscha, Short Hills, N. J.; second vice president, F. R. Zimmerman, Duluth; treasurer, G. L. Reeh, Westfield, N. J.; secretary, Charles Gray, Superior, Wis. Mr. Gray will be office manager and Mr. Zimmerman, works manager.

Uncle Sam Builds Torpedo Boat Fleet



■ Torpedo tubes for the navy's new torpedo boats get a coat of paint at Washington navy yard (above). Right, one of the PT-9 models of torpedo boats speeding over East river, New York. Wide World, and national defense advisory commission photo by Palmer



Died:

■ ALVIN IRWIN FINDLEY, editor emeritus, *The Iron Age*, died in St. Petersburg, Fla., Dec. 12, following a long illness. Mr. Findley had spent 50 years in journalism, 12 on weekly and daily newspapers and 38 on business papers. He was editor of the *Iron Trade Review* (now STEEL) from 1892 to 1905.

Born in Monmouth, Ill., June 29, 1859, Mr. Findley was educated in the Akron, O., public schools,



Alvin Irwin Findley

Buchtel college (later University of Akron) and Wooster college, Wooster, O.

He became an associate editor of *The Iron Age* in 1905 and six years later was appointed editor, a position he held until his retirement in 1930.

Mr. Findley was the first president of the National Conference of Business Paper Editors, organized in 1919, and was a director of the United Publishers Corp. (now the Chilton Co.) from 1924 to 1932. From 1922 to 1935 he was a director and vice president of the Montclair, N. J., national bank. He was for many years a member of the American Iron and Steel institute, the Iron and Steel institute (British), American Institute of Mining and Metallurgical Engineers, American Foundrymen's association, American Society for Testing Materials, American Institute of Weights and Measures, American Academy of Political and Social Science, the Phi Kappa Psi fraternity, and Phi Beta Kappa.

During his career, Mr. Findley contributed many articles on the iron and steel industry to magazines and newspapers and addressed many associations in the metal-working field. In 1911 he attended the conference of American and European steel manufacturers at

Brussels, Belgium, called by Judge E. H. Gary, then chairman of the United States Steel Corp., to consider the organization of an international association of steel producers of Great Britain, France, Germany, Belgium and the United States.

Theodore C. Wilson, 60, in charge of pig iron sales, Boston office, Republic Steel Corp., in Cambridge, Mass., Dec. 2. Born in Cambridge, he started in the steel business about 40 years ago with the Barbour-Stockwell Co., Cambridge; later was associated with John O. Henshaw Co., Boston; E. Arthur Tutein Inc., Boston, and Donner Steel Co., Buffalo. When the Donner company merged with Republic, Mr. Wilson joined the latter firm.

John B. Guthrie, 65, Chicago district sales manager, Carpenter Steel Co., since 1906, Dec. 7, in Evanston, Ill.

Marshall Williams, 67, one-time official of American Bridge Co., Pittsburgh, Dec. 5. A native of New Jersey and a graduate of Rutgers college, he joined Pencoyd Iron Works in 1898, later taken over by American Bridge, and from that date was continuously associated with the Bridge company, retiring June 1, 1940. At time of retirement he was assistant to president. He was a member, American Society of Civil Engineers and American Welding society.

Machine Tool Operating Rate 95.4 Per Cent

■ Machine tool industry's operating rate in November, measured in terms of payroll hours, was 95.4 per cent of reported capacity. This was 4.2 points higher than in the period last year, according to report by the National Machine Tool Builders' association, Cleveland. Operating rate in November compared with rate of 96.8 per cent in October; 94.9 per cent in September; 93.3 per cent in August and 88.3 per cent in July, low for 1940.

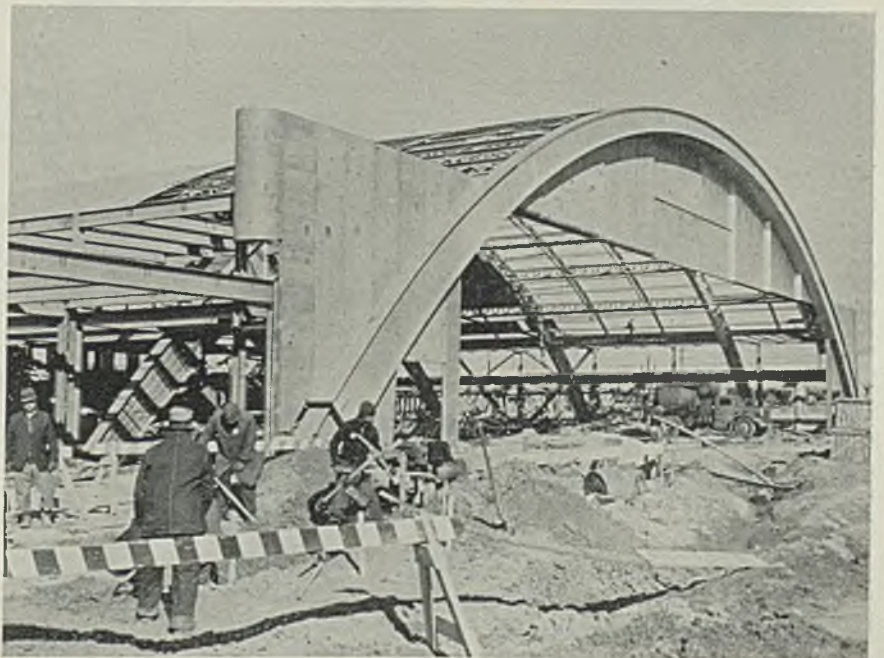
Capacity last month was reported to have increased 3 per cent over that of October, bringing the accumulated increase over September, 1939, to 54.9 per cent.

November Gear Sales Decline 20 Per Cent

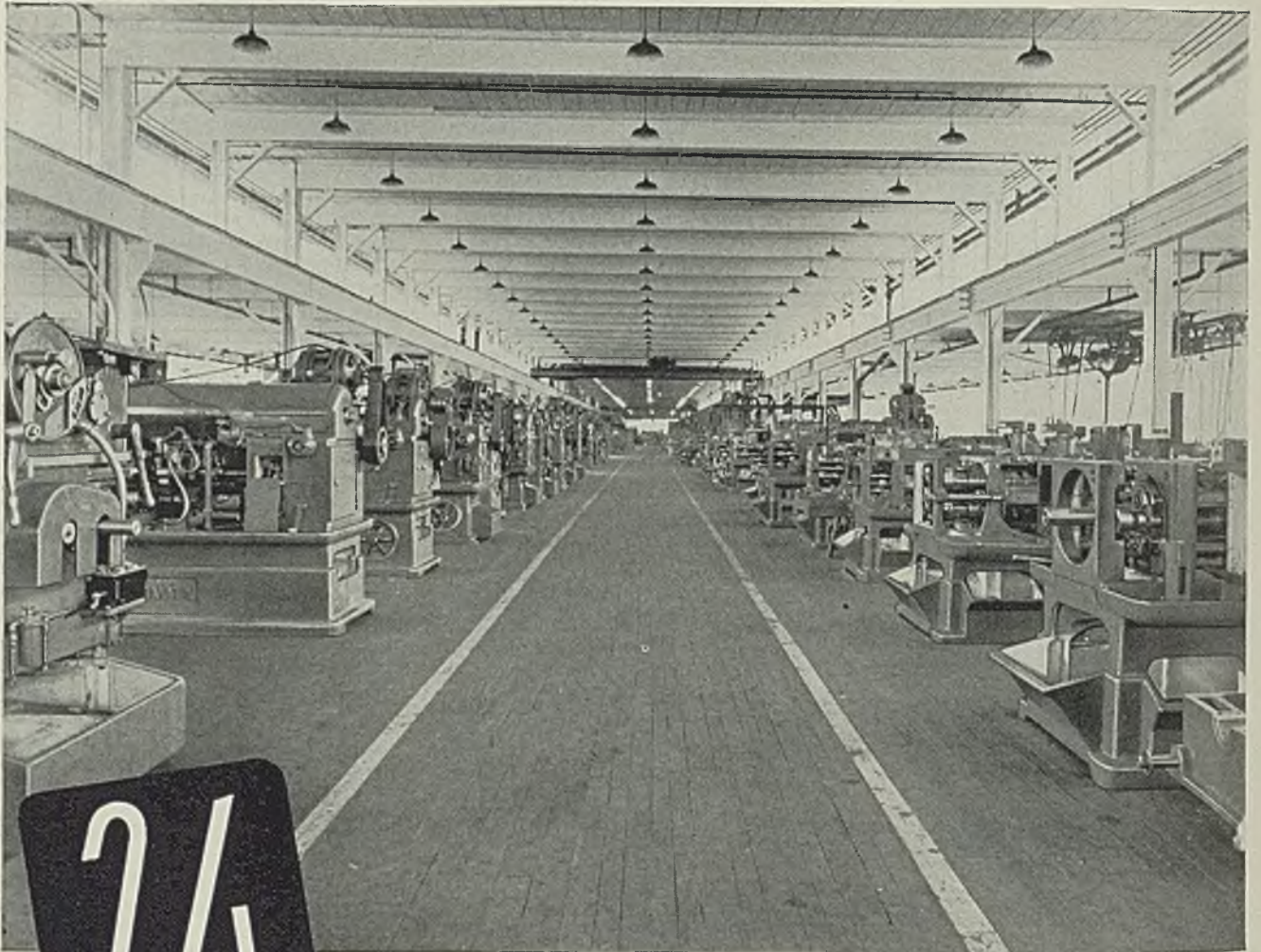
■ Industrial gear sales in November were 20 per cent lower than in October, peak month of the year, and 37 per cent above November, 1939, according to American Gear Manufacturers association, Wilkesburg, Pa. Association's index for November stood at 173, compared with 216 in October.

For 11 months in 1940, sales were 45.7 per cent higher than in the corresponding period of 1939. Indexes for 11 months this year averaged 150; in 1939, 103.

Washington Airport Gets Six New Steel Hangars



■ Steel for the first of six new hangars to be erected at Washington airport is under construction at Gravelly Point. Hangars will be large enough to accommodate larger planes than are now in service. NEA photo



View of part of the Cone assembly floor

24
YEARS

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*In business to make profits—***FOR YOU!**

FOR the past 24 years, Cone has designed and built automatic screw machines for the profitable production of thousands of types of machine parts. During these years, industry has accepted Cone machines as the last word in extracting the last cent of profits from screw machining operations. Cone engineers are backed by the years of experience necessary to design a machine to meet the modern demand for parts of extreme accuracy— at a price to beat competition.

Four-, six-, and eight-spindle Conomatics cover a range of work to include the requirements of every high production manufacturer. These machines are fully described in the Conomatic catalogs— have you sent for your copies?

CONE AUTOMATIC MACHINE CO., Inc., Windsor, Vt., U.S.A.

Windows of WASHINGTON



By L. M. LAMM

Washington Editor, STEEL

New Export Licensing System "To Have Little Effect".

Movement Abroad Already Greatly Restricted.

Foreign Demand for Iron, Steel Continues To Improve.

Shipments to United Kingdom 43 Per Cent of Total.

WASHINGTON

■ EXPORT licensing system which will be applied to various ferroalloys and a number of iron and steel products and commodities Dec. 30, will have relatively little effect because the movement of the former has been restricted over recent months. Ever since the President first applied this system on certain strategic materials last July, sellers, with the encouragement of the government, have been curtailing their export shipments. Meanwhile domestic shipments have been especially heavy.

Movement this month of ferroalloys in general may be the largest this year, sellers believe, even surpassing June and July, at which time there was anticipatory buying of many alloys due to price advances.

Export demand for iron and steel continues to improve, although sellers do not attribute this to the impending application of the export licensing system, Dec. 30. Demand, they say, has been coming out in larger volume from various sources which are not likely to be affected, such as Great Britain, Canada, South America, Dutch East Indies, India and certain African countries.

Egypt and Greece have recently been active, and with British control in the Mediterranean now more firmly established than ever, their shipments stand a good chance of going through. As to countries likely to be adversely affected by licensing system, shipments have been running light for some time, as sellers have been acting under more or less unofficial restraint.

Reflecting expanding demand

both here and abroad, export prices have been advanced \$2 a ton on sheets and plates which are now holding at 3.25c for No. 24 gage black sheets, and 2.45c for plates. Certain wire prices are reported to have been advanced \$4 to \$4.50 a ton and while \$42 appears to apply generally on rerolling billets, prices as high as \$43 and \$44 have been quoted by foreign buyers in some instances. Reinforcing bars and certain other products also are higher.

President Extends System

The White House announcement extending the licensing system:

"The President announced today that national defense requirements for iron and steel have increased to such extent that it has become necessary to subject, as of Dec. 30, 1940, iron ore, pig iron, ferroalloys, and certain iron and steel manufactures and semimanufactures to the licensing requirement. Licenses will be granted for exports to the British Empire and the Western Hemisphere; and for the present, so far as the interests of the national defense permit, for exports to other destinations in quantities approximating usual or pre-war exports."

State department has prescribed regulations and has defined the terms "iron and steel" to include the following:

Iron ore and pig iron.

Ferroalloys: Ferromanganese, spiegeleisen, ferrosilicon, ferrochrome, ferrotungsten, ferrovandium, ferrocolumbium, ferrocobalt, ferrotitanium, ferrophosphorus and ferromolybdenum.

Semifinished products: Ingots, bil-

lets, blooms, slabs, sheet bars, skelp and wire rods.

Finished products: Structural shapes, steel piling, plates, rails, splice bars and tie plates, merchant and concrete reinforcing bars, cold-finished, alloy and tool steel, hoops and baling bands, pipe and tube, drawn wire, nails and staples, barbed and twisted wire, woven wire fence, bale ties, fence posts, black plate, tin plate, sheets, strip, wheels, axles, track spikes, castings, and forgings.

United States exports of all classes of iron and steel products, other than scrap, totaled 6,336,535 gross tons during the first ten months of 1940. In 1939, this trade had amounted to only 1,772,068 tons during a comparable period, according to the department of commerce.

Shipments to Western Hemisphere countries, 1,950,000 tons, represent roughly 31 per cent of the 1940 trade, while the trade with the United Kingdom, 2,724,000 tons, equals 43 per cent. The entire Far East took only 15 per cent with Japan, 293,000 tons, accounting for less than 5 per cent of the entire export trade. Other countries in the Far East taking substantial quantities of iron and steel in 1940 include China, 133,000 tons, Netherlands Indies, 113,000 tons, and the Philippine Islands, 108,000 tons.

Exports to British Empire, including the United Kingdom, have amounted to 3,871,956 tons thus far in 1940 or 61 per cent of our total iron and steel trade. Shipments to the United Kingdom accounted for 2,724,000 tons, British dominions and colonial possessions in the Western Hemisphere took 761,600 tons, while the trade with British countries in the Far East and in Africa amounted to 386,000 tons.

Analysis of the \$7,700,000,000 naval ship construction and alteration program was made public last week by the national defense advisory committee as the third of a series giving the details on the present expansion of the defense program.

This analysis reveals that con-

tracts awarded for ship construction to date total over \$3,800,000,000. The remaining portion of the total will be utilized for armor, armament and equipment, to be contracted for as the ships approach completion.

Meanwhile great progress has been made in expediting contracts for new ships. The major portion of the contracts for new ships were cleared within 24 hours after the appropriation bill was signed in September. The process alone of letting contracts had sometimes taken months under the procedure used before the emergency.

Shipbuilding time has been materially cut. The 40-month building period for completing cruisers has been cut as much as one-eighth, submarine construction time has been cut from 30 months to 24 months. Destroyers under construction are being launched 3 months ahead of schedules.

At present new fighting ships are going into service with the navy at the rate of one every 12 days.

With 330 major combat ships under contract, rapid expansion in the nation's shipbuilding industries has been called for to meet the new speeded-up schedules. Present shipbuilding yards are being expanded, and new yards are being constructed on the West and Gulf Coasts. The enacted program for construction of shipways and shipyard facilities calls for navy construction totaling \$150,000,000.

Under the expanded defense program, many sections of the nation will participate in the primary contracts for ship construction. A regional breakdown of the contract awards shows that the major portion is concentrated in the northeastern section of the country. The New England region has received almost \$900,000,000 in awards, mostly in cities of Boston and Bath, Me., and New London, Conn. Over a billion dollars will be spent in the Middle Atlantic region, mostly in New York, Newark, N. J., and the Philadelphia-Camden area. In the South Atlantic region, the shipyards at Norfolk, Newport News and Portsmouth, Va., received the major portion of awards totaling nearly \$600,000,000. On the Pacific coast, San Francisco, Seattle-Tacoma, Wash., yards take the greater portion of over \$500,000,000 in contract awards. Other regions, making up the central section of the country, have received roughly \$200,000,000 in contract awards for construction of ships in the Great Lakes area.

Under the expanded shipbuilding program, subcontracting will be more widely spread than ever before. Such items as navigating equipment and engine assemblies arrive in their completed form, ready for installation. For example, in one instance, in the Tampa, Fla.,

shipyards, a completed diesel engine was put in place, having been produced by Nordberg Diesel Co., Milwaukee. Following the same procedure, entire boilers will be delivered; auxiliary machinery will be completed and assembled outside the yards, thus requiring only the actual installation work to be done within the ship yards themselves. This procedure will free the larger subcontracting facilities for other defense projects, while the smaller machine shops throughout the nation will participate in building up materials and subassemblies necessary to the program.

Intense activity in shipbuilding centers has resulted in a sharp rise in shipbuilding employment. The latest figures show 162,000 workers employed directly in the shipyards. For every employe in the shipyards there is another employed in plants furnishing materials for ship construction, bringing the total currently employed under the shipbuilding program to more than 300,000.

KNUDSEN REPORTS CHANGES IN PRODUCTION STAFF

William S. Knudsen, national defense production commissioner, has announced the following changes in his staff:

Mason Britton, vice chairman, McGraw-Hill Publishing Co., New York, who has been assistant director, is advanced to director of the machine tools and heavy ordnance division.

Harold S. Vance, chairman, Studebaker Corp., South Bend, Ind., who organized the division, has had to relinquish his full time duties but is continuing on a consulting basis.

Howard Dunbar, Norton Co., Worcester, Mass., and E. Porter Esley, E. L. Esley Machinery Co., Chicago, have joined the staff.

In the heavy ordnance division, the navy department has placed Commander Alexander S. Witherpoon at the service of the division to supervise placing of heavy ordnance, under Mr. Britton's direction.

WALSH-HEALEY ACT "DISTURBS DEFENSE PROCUREMENT"

Rear Admiral Ray Spear, chief, bureau of supplies and accounts of the navy department, last week called attention to the fact that the Walsh-Healey act "continues to be a disturbing factor in procurement of some lines of government supplies."

Admiral Spear stated that while many of the early difficulties which his bureau ran into under the Walsh-Healey act "have been overcome or otherwise minimized, the promulgation of minimum wages has created new problems."

"There are many manufacturers who will not bid and take a contract subject to the Walsh-Healey act," he said, "and others who will accept

all provisions of the act except the minimum wage determination."

In one instance, the report said, a four-month delay was encountered before a contract could be negotiated. The navy advertised for bids on 2000 airplane clocks, for which there were prospective bidders. Only one bid was received, the report said, and that carried a reservation that the award could not be accepted without exemption from the act. Finally a contract was negotiated under the open market provision of the Walsh-Healey act.

LICENSING REQUIREMENT REDUCES SCRAP EXPORTS

Col. Russell L. Maxwell, administrator of export control, in reviewing the iron and steel scrap situation, last week issued the following statement:

"In the interests of national defense, No. 1 heavy melting scrap, on July 26, 1940, was placed on the export control list, subjecting it to the licensing procedure, and insuring adequate consideration of domestic needs before granting an export license.

"The rising tempo of our rearmament program necessitated, on Sept. 30, 1940, an extension of the export control plan to include 'all iron and steel scrap of every kind and description, classified or unclassified.' Consistent with the policy of minimizing disturbances to normal business, these regulations did not become effective until Oct. 15, 1940.

"The success of these controls is clearly indicated by contrasting 59,070 short tons, the November figure for export licenses granted of iron and steel scrap, with the October figure of 1,195,301 short tons, a reduction of 94 per cent."

SEEK "CRITICAL" MATERIALS DEPOSITS IN LATIN AMERICA

Search for possible Western Hemisphere sources of materials listed as "necessary" or "critical" in production of steel and lightweight alloys and heretofore imported from Europe and the Far East is being vigorously conducted. Harold L. Ickes, secretary of the interior, last week reported six scientists of the United States geological survey were enroute to Bolivia, Cuba and Brazil to explore areas which may furnish tin, tungsten, manganese, chromite, antimony and other metals essential to Western Hemisphere defense.

Explorations, said Secretary Ickes, were planned with the co-operation of the nations concerned, to develop economic and military defense. Expenses will be borne largely by United States, but the Latin American countries involved will furnish supplies, transportation and the co-operation of their own geologists.

FINANCIAL

INDUSTRIES AFFECTED BY WAR INCREASE PROFITS

■ **AVERAGE** net profit earned in third quarter, 1940, by 284 leading companies in 13 industrial groups directly affected by war or the national defense program was 49.7 per cent greater than in the period last year, according to a compilation by the National City Bank of New York. In first nine months this year the same companies had a combined gain over the period in 1939 of 79.2 per cent.

Two hundred fifty-six companies, in 14 industrial groups affected only indirectly by war and the defense program, showed a combined decline in third quarter net earnings of 7.2 per cent from the period in 1939. These companies, in first nine months of 1940, had an aggregate gain in net income of 16.8 per cent over the period last year.

Combined gain in third quarter net income for both groups of companies, totaling 540, was 21.7 per cent over the period last year; in first nine months this year, combined gain of all the companies was 43.8 per cent.

Industrial groups directly affected by war or the defense program and showing greatest rate of increase, more than 100 per cent, for the nine months included: Iron and

steel, railway equipment, building equipment, paper products and wood products. Chemical products industry showed smallest percentage gain, 20.6 per cent.

In the groups affected only indirectly by war, coal mining industry showed a gain of more than 100 per cent in first nine months, 1940, over the period last year. Petroleum products industry was second, with gain of 64.8 per cent. Six industries of the 14 in this classification showed a decline in net earnings, greatest being baking industry's decrease, 15.4 per cent.

France Recovering Slowly From Defeat by Germans

■ **Unoccupied** France under the leadership of Marshal Petain slowly is recovering from the shock of German defeat, according to Eugene Darling, vice president, International Selling Corp., 30 Beaver street, New York, who recently returned from a business trip to southern France. While the Vichy government must exercise much tact in its relations with Germany, Mr. Darling says, it is far from a puppet government, and is being allowed to proceed with its problems without too much interference from Berlin.

The Vichy government's major problem now is to supply food, clothing and other necessities to the

some 20,000,000 people living in southern France.

Mr. Darling says the fact that southern France has practically no steel capacity is not creating the hardship to industry that might be expected. France has depended on aluminum to a greater extent than on steel, and the bauxite mines are being worked to supply many manufacturing needs.

Mr. Darling doubts that much, if any, of this aluminum is being shipped to Germany. What is being shipped is on a strictly commercial basis.

Much research is being devoted to synthetic materials, such as soap, leather and gasoline.

The unoccupied region is able to produce some materials for export. These include certain chemicals which long have been imported to this country. Greatest handicap is in getting shipments through the British blockade. Little French merchandise is being exported to other continental countries.

Spain, according to Mr. Darling, is anxious to avoid a close alliance with the axis powers. At low ebb economically and still suffering from the effects of her own civil war, Spain's first desire is a long period of peace.

Ayres Cautions Against Abnormal Expansions

■ **Especially** prosperous in 1941 will be the industrial regions which produce munitions, tide-water communities where ships are built, the entire steel industry, Great Lakes shipping and coal-carrying railroads. This was the opinion expressed by Col. Leonard P. Ayres, chief statistical officer of the war department, before the Cleveland Chamber of Commerce Dec. 10. Real or near depression may persist in agricultural districts which formerly sold much to Europe, he said.

Before the middle of next year the heavy and consumer goods industries will be fully employed and striving to increase their productive capacities, he continued. In most cases erection of new plants or additions should be avoided if possible. Frequently results can be achieved by making greater use of subcontractors. Transformation of business back to normal peace time operations, whenever that may come, will cost considerable money and manufacturers should be setting aside that money from present profits.

Some prices will advance and only very few decline in the next two years, he stated. One price already visibly advancing is that of labor. However, commodity price increases in 1941 will not be of an extent to justify calling it inflation.

Steel Girders Support Capitol Roof



■ **Temporary** steel girders support the ceiling of the house of representatives, Washington, while workmen prepare to reinforce the roof, which has been declared unsafe. Acme photo



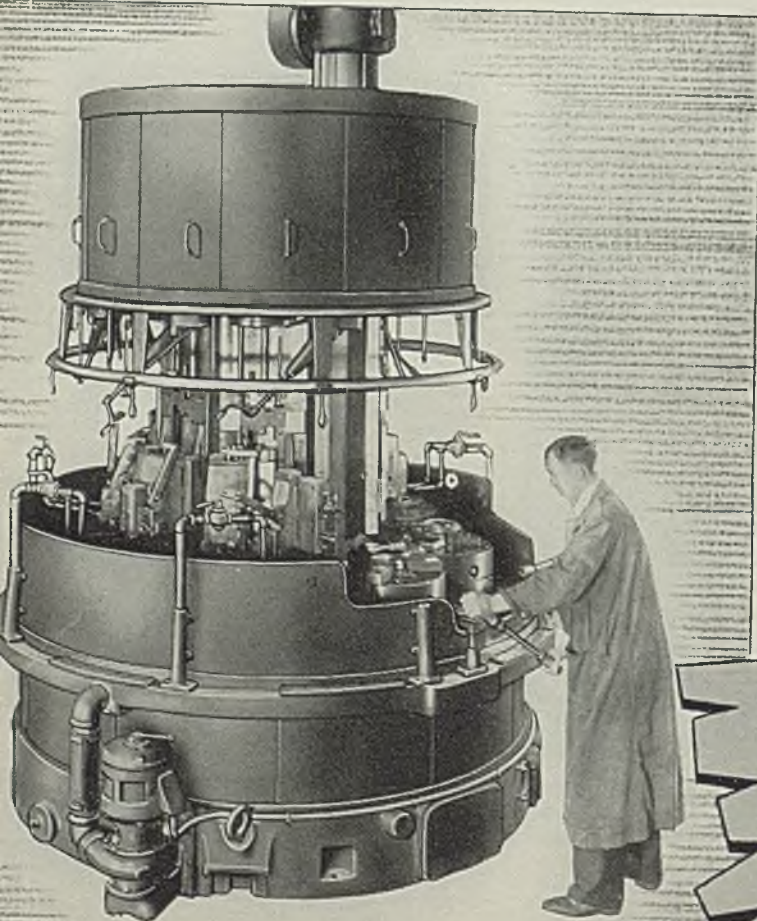
Too Many Cooks—

There's a lot to that old adage—and it fits other things than soup.

For example, it gives a hint as to why many a plant has replaced groups of single spindle machines with one Mult-Au-Matic. The fewer the operators who must handle any individual piece, the fewer the chances for error and the greater the saving in time. Hence, the popularity of the Mult-Au-Matic method.

If you are unacquainted with the Mult-Au-Matic method and its application in modern manufacturing, write our engineering department. We shall be glad to explain in detail, either the general principle and its merits, or to show its application to your specific needs.

Below is a Type "D" Mult-Au-Matic. It is available in 6- and 8-spindle types and in various sizes to fit industry's needs.



**THE BULLARD
COMPANY**
BRIDGEPORT, CONNECTICUT

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

400 Per Cent Increase in Aircraft Welding Forecast.

Chrysler Corp. Grants Wage Increase, Vacation Pay.

UAW Requests Labor Board Election in Ford Plant.

Many Plant Expansions Announced in Detroit Area.

DETROIT

■ PROSPECTS of a 400 per cent increase in volume of aircraft welding are looming on the horizon, according to B. L. Wise, chief electrical engineer of Federal Machine & Welder Co., speaking here the other evening before a crowd of about 200 from the Detroit section of the American Welding society, which jammed into a small room at the Detroit-Leland hotel to hear a discussion of some possibilities of resistance welding in the defense program.

One reason for the expected increase in welding of aircraft elements is the approval of spot welding of stressed members, reported to have been granted by the U. S. army and navy as well as by Great Britain. This may mean a reduction in the thousands of rivets now required in aircraft assembly. For example, a small plane will have about 20,000 rivets against 50,000 spot welds. A large bomber will show around 500,000 rivets and welds together.

Rivet cost is estimated to run around 3 cents each, and one rivet usually is replaced by two spot welds. Tests show rivets and welds to be comparable on a strength basis, while welds have somewhat better corrosion resistance and permit reduction in overall weight of the structure.

With the automobile parts industries about to proceed on a large aircraft parts program, additional importance was given to Mr. Wise's remarks. However, he sounded several notes of caution on the matter of aircraft welding. In the first place, it has been found that if welding currents and pressures are

increased two or three times from their normal values, much better welds result in aluminum alloy. But when welding current is doubled, the power requirement for the welder is quadrupled. Particularly in the aircraft industry, some plants are approaching the limit of power supply. If additional welders are placed in service, the resulting drain on power, even though only momentary, may result in serious voltage drop and nonuniform welds.

Problem for Power Companies

Power companies already are bumping into this problem, especially where plants in outlying sections have welding machines which require special power lines to supply the necessary KVA. Obviously there is little revenue as far as power consumption is concerned because the welding operation is only a brief surge, but nevertheless the reservoir of power must be there to supply the machines when needed. Thus, expensive substations, high tension lines, transformers and the like must be provided, sometimes to satisfy the welding requirements of only one plant. In such cases, the power companies are forced to charge the customer for the erection of these facilities, one plan being to charge the full cost of materials and half the cost of the labor, with the understanding that when additional outlets develop they can be cut in on the special power line.

Mr. Wise noted that one solution to the power requirements in air-

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craft welding is the use of the "stored energy" type of welding, such as the Sciaky, Vanco, Taylor-Winfield or Federal processes, in which condensers are used to store up power supply for the weld and no sudden drainage from the power line is encountered. Aluminum welds made by this process, in the opinion of some engineers, are superior to other welds.

Several samples of welded parts involved in defense requirements were shown by Mr. Wise. Most interesting was an all-welded steel shell casing for a 75-millimeter projectile. Usually made of brass, these cases are naturally considerably more costly than if steel were used. Often, in time of war, the scarcity of brass requires these cases being recovered on a battle field and returned for reloading. In an emergency, the steel cases, shown publicly here for the first time, could be produced in quantity at low cost and scrapped after firing.

Another sample was a tail fin assembly for an aerial bomb, of cold-rolled steel and spot and projection welded at the rate of 300 pieces per hour on a 50-KVA light-duty press welder. Still another was a small trench mortar steel fin spot welded at a speed of 600 per hour on preloaded jigs and 300 an hour by hand loading. Use of preloaded or shuttle-type jigs in welding this type of part usually will double production speed.

Stainless steel wing section with corrugated backing sheet and stressed skin was shown. It was produced by roller or seam welding with interrupted current.

■ HEADLINE news last week was the announcement by Chrysler of wage increases and vacation pay for 60,000 employees in 11 plants covered by UAW-CIO contracts, the bulk of them in Detroit. The corporation's agreement with UAW expired technically last Tuesday and negotiations had been in process for

two weeks on amendments. The new provisions, to be in effect for one year include: (1) Payment of \$40 now in lieu of vacation with pay next summer to each hourly rated employe with one year seniority; (2) increase in hourly wage rates of 2 cents; (3) payment of group life insurance for men called to military service; (4) elimination of a practice by which under certain conditions employes have been receiving double payments for overtime; (5) change of work day to 7 3/4 hours with 15 minutes lunch time and full 8-hour pay.

Wage increases and vacation pay may aggregate \$6,744,000 for a year.

Terms of the Vultee Aircraft contract with the UAW-CIO, in force until April, 1942, were being studied carefully in the motor parts industries as an example of labor problems on the Pacific coast and their relation to problems here. Interestingly, the contract provides for a review of wage rates in the aircraft industry of southern California every four months and an adjustment of Vultee rates to these levels. However, in no case shall these adjustments be downward. This is in contrast to the Chrysler announcement which in effect freezes wage levels for a year. Vultee basic minimum rate is 62 1/2 cents per hour compared with basic minimums here in the neighbor-

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1938	1939	1940
Jan.....	226,952	356,692	449,492
Feb.....	202,597	317,520	422,225
March....	238,447	389,495	440,232
April....	237,929	354,266	452,433
May.....	210,174	313,248	412,492
June....	189,402	324,253	362,566
July.....	150,450	218,494	246,171
Aug.....	96,946	103,343	89,866
Sept....	89,623	192,678	284,583
Oct.....	215,286	324,688	514,374
10 mos..	1,857,806	2,895,059	3,674,434
Nov.....	390,405	368,541	.....
Dec.....	406,960	469,120	.....
Year	2,655,171	3,732,608	.....

Estimated by Ward's Reports

Week ended:	1940	1939†
Nov. 16	121,943	86,700
Nov. 23	102,340	72,520
Nov. 30	128,783	93,638
Dec. 7	125,690	115,488
Dec. 14	125,625	118,405

†Comparable week.

hood of 80 cents per hour. Beginners with Vultee are to receive 55 cents, increased to 57 1/2 after 30 days and to 62 1/2 cents in 90 days.

Meanwhile the UAW has requested consent of the Ford Motor Co. for an NLRB election among employes of the Rouge plant which is

almost certain to be politely refused. Special assessments on union memberships have been made to carry on the current campaign to organize Ford workmen, confined so far to distribution of defamatory literature.

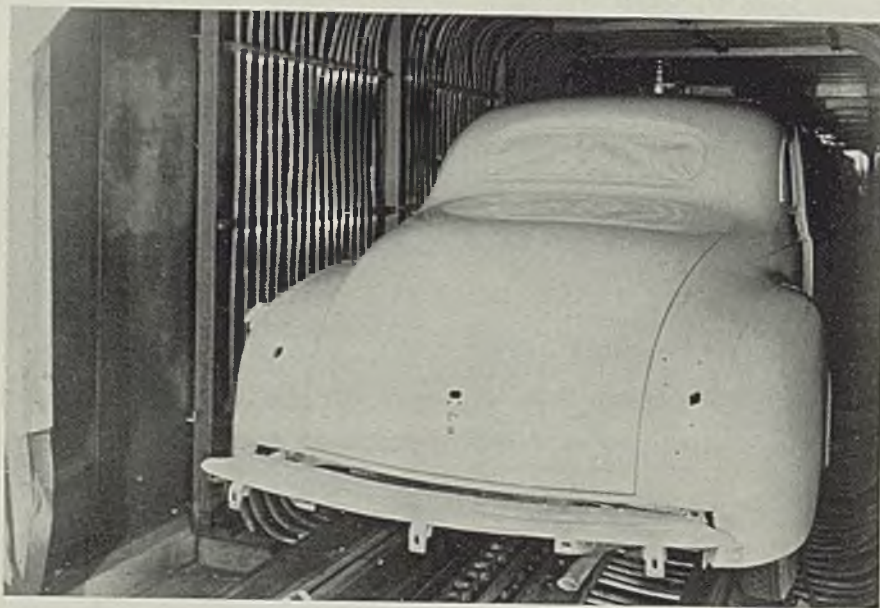
However, Ford officials have taken steps to tighten up on plant visitors, making it exceptionally difficult for anyone to get into any plant department without time-consuming procedure of identification and pass issuance. One supplier here who had a 10-minute job to do in a Ford production department, reports it took him three hours.

■ NEW plant construction is proceeding in this area on a broad scale, large numbers of projects among smaller plants being announced. A few are: Addition of 14,000 square feet by City Pattern Works for aluminum foundry, core room and pattern shop; 2500-square foot addition by Atlas Foundry Co. for two new core ovens; 150,000 square feet for new plant of Superior Tool & Die; 30,000 square feet for addition to Federal Engineering Co.; 15,000 square feet for Weltronic Corp.; 18,000 square feet for warehouse of Detroit Steel Corp.; 120 x 150-foot two-story mechanical building for Revere Copper & Brass; \$45,000 building for Seneca Machine Tool Products Co.; new engine test building for Continental Motors; new stamping plant for Fitzsimons Mfg. Co.; \$220,000 office building for AC Spark Plug Co.; new research laboratories for Ethyl Gasoline Corp.; eight-bay addition to Ford cold mill for storage purposes; 80 x 130-foot plant for Howell Electric Motors, Howell, Mich; and new plant for Bundy Tubing Co.

■ SUMMARY of General Motors' present role in the defense program was contained in a message to stockholders last week. In it was revealed the fact that GM has set up a defense materials committee for the purpose of co-ordinating production facilities. Capital investment of \$100,000,000 has been made to supplement existing facilities and those being provided by the government, while production orders for about \$400,000,000 have been booked. These break down as follows: \$164,800,000 for Allison airplane engines; \$46,400,000 for diesel engines; \$61,400,000 for machine guns; \$9,500,000 for shells; \$7,000,000 for airplane equipment such as control and instrument items; \$20,000,000 for trucks; \$35,000,000 for fire control equipment, tank gun mounts, cartridge cases, fuses, magnetos, motors and other miscellaneous equipment; and \$60.

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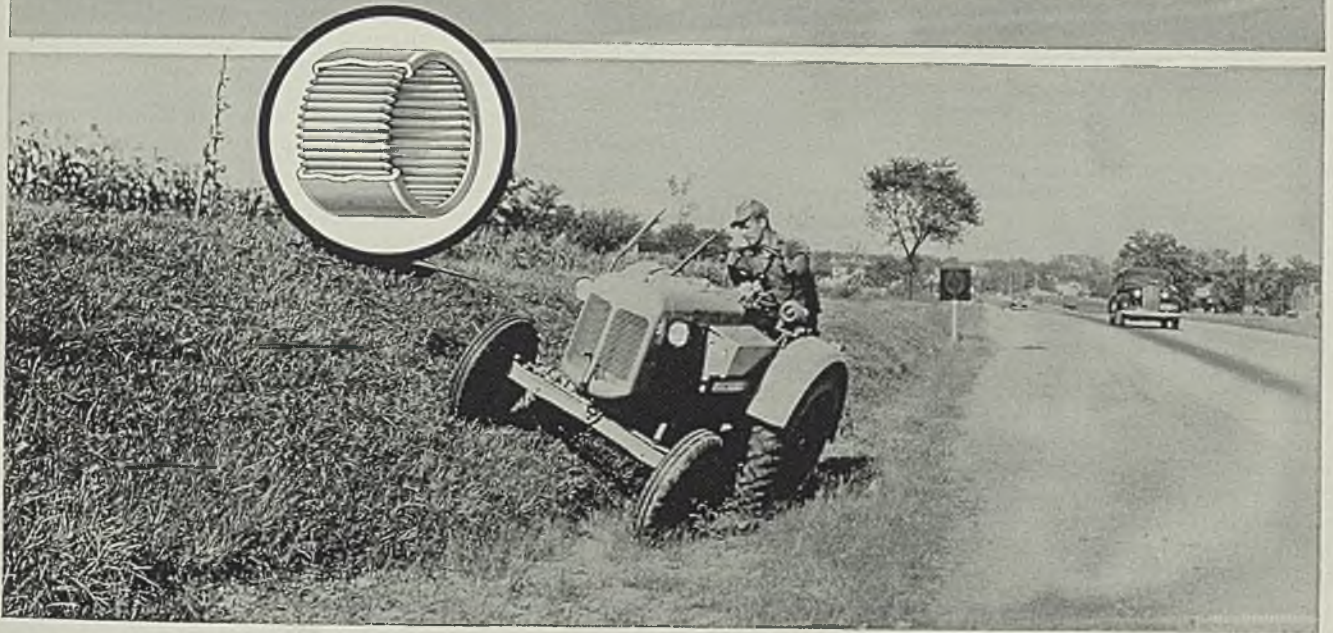
Induction Heating Used in Drying Ovens



■ Well-known principle of induction heating, by which the heat proceeds from the inside to the surface is used in these drying ovens for Chrysler bodies. Former gas burners have been replaced with loops of wire which form a large induction coil. High-frequency generator produces three-phase current which

flows through three coils and is induced in the steel of the bodies as they move through the ovens. Temperature reaches 120 degrees Fahr. on the inside of the body, 180 degrees at the surface. Faster drying and a superior finish are claimed, inasmuch as the paint next to the steel is dried first.

"TORRINGTON NEEDLE BEARINGS TAKE HEAVY ROTATING AND OSCILLATING LOADS EFFECTIVELY" IN CENTAUR HI-WAY MOWER



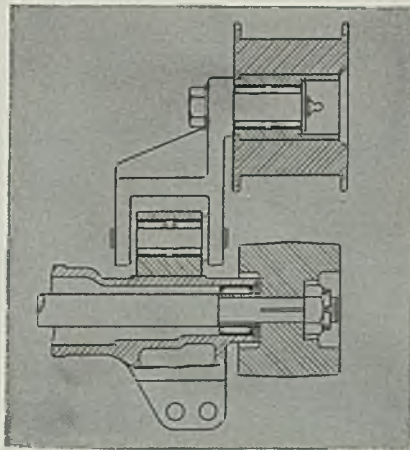
Eleven applications of the Needle Bearing help to reduce friction, increase operating efficiency and add to the service-life of this Model KM Centaur Hi-Way Mower.

SWAYING and lurching up-ditch, down-ditch, over slopes, fills and embankments—and most of the time at an acute angle—the popular Centaur Hi-Way Mower plies its job of keeping road-borders clear of weeds and other unsightly growths that mar the beauty and impair the safety of modern highways.

As can be appreciated, such rough and tumble service imposes severe strain on every component part of this motorized mowing unit. Therefore, the long service-life of the Model KM Centaur is adequate testimony to the skilled engineering construction with which it is built, and the care with which integral parts are selected.

The Torrington Needle Bearing is no exception to this rule. According to Mr. E. A. Cross, Superintendent of the Centaur Corporation, "The Needle Bearing was selected because it is economical in cost, simple to install, requires minimum space in cramped locations, retains lubrication well, and withstands heavy rotating and oscillating loads effectively.

"All told," adds Mr. Cross, "eleven applications of Torrington Needle Bearings are used on Centaur KM and RW mowing equipment. In three applications of the Needle Bearing, Torrington inner races* are used as 'bushings' to withstand heavy oscillating shock loads



Typical of these applications is the mower drive shaft, belt tightener, pulley and bracket which illustrates the compact design permitted by Torrington Needle Bearings.

and have proved very efficient."

When any manufacturer selects the Needle Bearing for as many of its features as has the Centaur Corporation, there is very little that we can add.

Except, perhaps, to stress its ready adaptability to product design, which frequently results in marked savings in weight, space and cost. That, plus the suggestion that *you* translate these remarkable manufacturing and operating advantages into terms of *your* product, to appreciate why so many leading manufacturers have adopted this revolutionary anti-friction development.

For further information write for Catalog No.10. For Needle Bearings to be used in heavier service, request Booklet 103X from our associate, the Bantam Bearings Corporation, South Bend, Ind.

*Where a hardened shaft is not feasible, a Torrington hardened inner race can be supplied.

The Torrington Company
ESTABLISHED 1866
Torrington, Conn., U.S.A.

Makers of Needle and Ball Bearings

New York Boston Philadelphia Detroit
Cleveland Chicago London, England

TORRINGTON NEEDLE BEARING

Scrap Inventories Gain

4 Per Cent in Third Quarter

■ DOMESTIC stocks of iron and steel scrap at consumers' and suppliers' plants and in transit at the end of September approximated 6,993,000 gross tons, a 4 per cent increase over the 6,750,000 tons reported at the end of June, according to the bureau of mines, Washington.

Known stocks held by consumers and suppliers Sept. 30 were equivalent to an 8-weeks' supply at the rate of consumption in September, a position which was virtually unchanged from the second quarter.

Although total stocks increased, those on hand at and in transit to suppliers' yards decreased 7 per cent from June 30 to Sept. 30; stocks on hand at and in transit to consumers' plants increased by 9 per cent. Thus, while suppliers' stocks on Sept. 30 amounted to 2,136,000 tons, compared with 2,298,000 tons at the end of June, con-

sumers' stocks of scrap were 4,857,000 and 4,452,000 tons, respectively.

Inventories held by the larger suppliers reporting in both canvasses decreased 21 per cent, while railroad stocks increased by 3 per cent.

In western Pennsylvania reported stocks of purchased and home scrap were equivalent to at least a 5-weeks' supply; the district comprising eastern Ohio and West Virginia had a 6-weeks' supply and other principal consuming districts had from a 6 to 9-weeks' supply available.

Total Consumption Increased

The accompanying summary of scrap and pig iron stocks was compiled from returns received from 767 consumers who accounted for 95 per cent of the total scrap used in 1939 from 66 large railroads; and from 199 selected manufacturing

plants. Also included are figures from 930 dealers and 845 auto wreckers who accounted for 90 per cent of the tonnage reported from these sources in 1939.

Total consumption of scrap and pig iron increased 10 per cent in September over June. This was occasioned by gains of 24 per cent in purchased scrap, 8 per cent in home scrap, and 6 per cent in pig iron.

Estimated consumers' stocks Sept. 30 included 3,096,000 gross tons of purchased scrap; 1,761,000 tons of home scrap; and 3,372,000 tons of pig iron. The September figures represent increases over the June 30 figures of 13, 4 and 9 per cent respectively.

No estimate of stocks held by non-consumers was possible inasmuch as the coverage of the canvass insofar as suppliers are concerned is unknown. Data, however, include virtually complete returns from the larger suppliers.

Stocks reported by dealers, auto wreckers, railroads and manufacturers declined from 2,298,000 tons on June 30 to 2,136,000 tons on Sept. 30, a decrease of 7 per cent. Although suppliers' stocks declined in the United States as a whole, in the large scrap-consuming areas of Maryland, western Ohio, Indiana, and Michigan, increases of 36, 28, 8 and 8 per cent, respectively, were reported. In western Pennsylvania, eastern Ohio, Illinois and Alabama, suppliers' stocks declined 7, 13, 1, and 43 per cent respectively.

Scrap and Pig Iron Stocks Sept. 30

	Gross Tons				Total*
	Scrap iron dealers	Automobile wreckers	Railroads	Manufacturers	
Suppliers' stocks					
Prepared scrap:					
No. 1 heavy-melting steel	315,984	10,898	75,408	5,050	407,340
No. 2 heavy-melting steel	289,054	33,487	3,923	1,914	328,378
Bundles	95,928	1,480	337	3,580	101,325
Cupola grades	207,480	4,182	31,052	1,904	244,618
All other	229,525	9,790	155,025	19,366	413,703
Total	1,137,971	59,837	265,745	31,814	1,495,367
Unprepared or partially prepared scrap	354,892	87,369	74,163	1,408	517,832
Scrap in transit to yards or for export and at docks	118,201	1,787	2,387	.....	122,375
Total scrap	1,611,064	148,993	342,295	33,222	2,135,574

* As reported. Total suppliers' stocks cannot be estimated due to unknown coverage.

	Consumers' stocks			Total*
	At plants	In transit to plants		
Purchased scrap:				
No. 1 heavy-melting steel	909,856	54,033		963,889
No. 2 heavy-melting steel	418,952	37,866		456,818
Bundles	179,162	20,858		200,020
Cupola grades	460,659	27,040		487,699
All other	804,036	34,506		838,542
Total	2,772,665	174,303		2,946,968
Home scrap:				
Open-hearth grades	1,224,985	1,100		1,226,085
All other	449,347	427		449,774
Total	1,674,332	1,527		1,675,859
Total scrap	4,446,997	175,830		4,622,827
Pig iron	3,195,486	59,428		3,254,914

* As reported. Total consumers' stocks estimated as follows: Purchased scrap 3,096,000 tons, home scrap 1,761,000 tons, total scrap 4,857,000 tons, and pig iron 3,372,000 tons.

Historical Incident Suggests Trade Name

■ Jersey Shore Steel Co.'s new trade name, "Fair Play", is adopted from an historical incident famous in the Jersey Shore, Pa., area where the company is located. Before the Declaration of Independence was signed at Philadelphia, a group of pioneers had settled in the area surrounding what is now Lock Haven, Pa., and was then outside the limits of the proprietary government. These pioneers had established their own form of government, independent of the continental congress, and known as the Fair Play System. On July 4, 1776, the same day the Declaration of Independence was signed at Philadelphia, the Fair Play settlers, having heard the colonists were about to denounce their allegiance to England, convened and did likewise.

When Charles C. Steel recently was appointed research engineer for the Jersey Shore company, one of his first tasks was to issue a brochure recalling the incident and announcing adoption of "Fair Play" as the company's trade name.

\$108,295,167 Defense Contracts

Awarded; Ordnance Orders Heavy

AWARDS of government defense contracts, reported last week, aggregated \$108,295,167.84, with war department's total nearly double that of the navy. Ordnance and quartermaster corps awards continued heavy. Federal government's policy of financing plant expansions to increase production was illustrated in award of contracts to several plane builders for acquisition of increased manufacturing facilities and floor space.

Navy department reported expansion contracts had been awarded Foote Bros. Gear & Machine Corp., Chicago, for aircraft engine gear manufacture; Edo Aircraft Corp., Long Island, N. Y.; and United Aircraft Corp., East Hartford, Conn. War department reported expansion contracts awarded to: Aviation Mfg. Corp., Lycoming division, Williamsport, Pa., \$1,597,491.31 for additions to aircraft engine manufacturing plant; Fairchild Airplane & Engine Corp., Hagerstown, Md., \$982,890.74 for additional plant facilities and manufacturing space.

Construction of a 2000-bed can-

tonment type general hospital at Atlanta, Ga., to cost approximately \$2,776,200; a 1000-bed hospital of similar type at Ft. Benjamin Harrison, Indianapolis, to cost about \$1,525,000; and a 1000-bed hospital at Ft. Dix, New Jersey, to cost approximately \$1,430,000, were authorized by the war department last week. War department announced the following:

Ordnance Department Awards

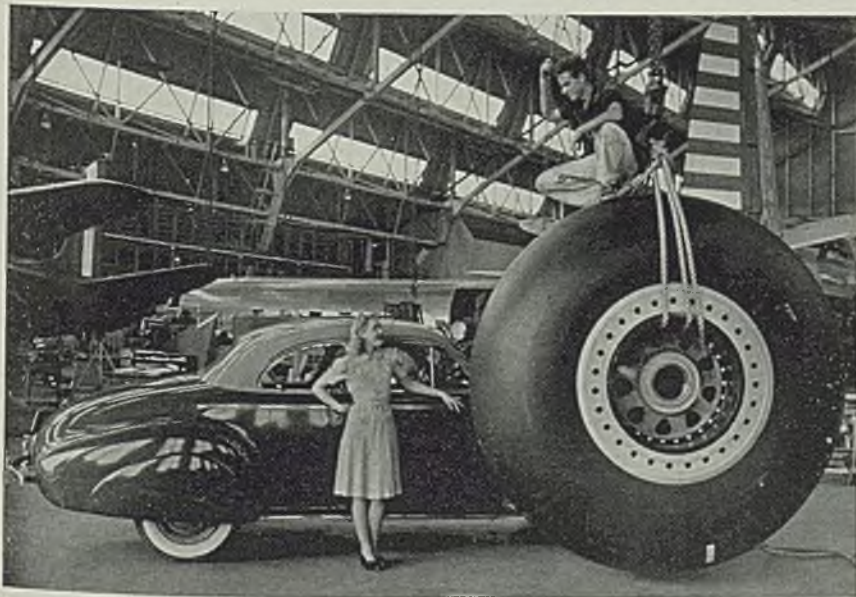
American-La France Foamite Corp., Elmira, N. Y., fire extinguishers, \$2152.18.
 American Metal Co. Ltd., New York, small arms ammunition components, \$88,950.
 American Type Founders, Elizabeth, N. J., artillery materiel, \$570,380.
 Bers, E., & Co., Philadelphia, small arms ammunition components, \$125,200.
 Bethlehem Steel Co., Bethlehem, Pa., steel, \$5769.05.
 Blood Bros. Machine Co., Allegan, Mich., universal steel joints, \$1410.50.
 Brown-Brockmeyer Co. Inc., Dayton, O., motor magnetic switches, stop-start push buttons, \$1210.80.
 Brown & Sharpe Mfg. Co., Philadelphia, gages, machines, \$30,348.50.
 Clark, Geo. V., Co. Inc., Long Island City, N. Y., packing cans, \$1949.96.
 Colt's Patent Fire Arms Mfg. Co., Hart-

ford, Conn., small arms materiel, \$11,573,616.42.
 Counties Supply Co., Philadelphia, artillery materiel components, screw drivers, \$4148.76.
 Cowles, C., & Co., New Haven, Conn., artillery materiel components, \$3268.
 Crawford Mfg. Co. Inc., Kansas City, Mo., small arms materiel, \$38,557.81.
 du Pont, E. I., de Nemours & Co. Inc., Wilmington, Del., ammunition components, \$3750.
 Duro Metal Products Co., Chicago, artillery materiel components, \$1210.
 Firestone Tire & Rubber Co., Akron, O., small arms materiel, \$3,986,340.
 Gilbert & Barker Mfg. Co., Springfield, Mass., water chests, \$173,390.23.
 Goodrich, B. F., Co., Akron, O., band tracks for half-track vehicles, \$5,780,100.
 Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$6343.08.
 Gulberson Diesel Engine Co., Chicago, diesel engines, engine parts, \$3,894,631.33.
 Irwin Auger Bit Co., Wilmington, O., screw drivers, \$2047.50.
 Jackes-Evans Mfg. Co., St. Louis, metallic belt links, \$783,000.
 Larkin Packer Co., Davis Boring Tool division, St. Louis, tools, \$1373.40.
 McEvoy Co., Houston, Tex., small arms materiel, \$810,360.
 Mines Equipment Co., St. Louis, fire control equipment, \$10,398.
 New York Drop Cloth Mfg. Co., Long Island, N. Y., artillery materiel components, \$8892.
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., gages, machines, \$59,133.09.
 Quality Hardware & Machine Corp., Chicago, motor drives, \$38,097.
 R. & M. Mfg. Co., Royal Oak, Mich., gages, \$2847.69.
 Remington Arms Co. Inc., Bridgeport, Conn., small arms ammunition components, \$5635.98.
 Revere Copper & Brass Inc., Baltimore, hard copper rotating bands, brass colls, \$396,327.
 Scovill Mfg. Co., Waterbury, Conn., ammunition components, \$4,231,240.
 Star Drilling Machine Co., Akron, O., artillery materiel components, \$21,402.
 Timken-Detroit Axle Co., Detroit, axle parts, \$1858.61.
 Universal Crusher Co., Cedar Rapids, Iowa, small arms materiel, \$802,410.
 Vinco Corp., Detroit, gages, \$11,988.80.
 Waltham Gauge Co., Detroit, gages, \$1280.50.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., machinery, \$6500.
 Weinstein, S., Supply Co., New York, artillery materiel, \$1817.37.
 West & Dodge Thread Gauge Co. Inc., Boston, gages, \$2293.20.
 Williams, J. H., & Co., Buffalo, artillery materiel components, \$1160.
 Wood, John, Mfg. Co., Muskegon, Mich., assembly screw fillers, \$7855.
 Wyckoff Drawn Steel Co., Ambridge, Pa., steel, \$115,460.

Quartermaster Corps Awards

Aeromotor Co., Chicago, steel forestry type observation towers, Barksdale field, Louisiana, \$4200.
 Brandon, Omer, Detroit, sewers and water distribution system at Selfridge field, Michigan, \$21,132.
 Coughlan, J., Construction Co., Boston, fire water system at Ft. Standish and Deer Island, Massachusetts, \$16,200.
 Chicago Bridge & Iron Works Inc., Houston, Tex., elevated steel water tank at Ft. Sam Houston, Texas, \$69,900.
 Ferro Concrete Construction Co., Cincinnati, temporary housing, Ft. Thomas, Kentucky, \$159,700.
 General Motors Corp., Chevrolet division, Detroit, trucks, \$14,935.06.

Tire and Wheel for Army's Superbomber



World's largest airplane tires, each 96 inches in diameter, arrived recently at Douglas Aircraft Co.'s plant in Santa Monica, Calif., for installation on the "Guardian of a Hemisphere", the B-19 superbomber nearing completion for United States army air corps.

One of two main wheel assem-

blies for the craft's tricycle landing gear, the unit shown—tire, tube, steel wheel and brake—weighs in all 2700 pounds. Air in tube alone weighs 28 pounds.

Tire and tube were manufactured by Firestone Tire & Rubber Co., Akron, O., wheel and brake by Bendix Aviation Corp., South Bend, Ind.

Green, A. L., Plumbing Co. Inc., New York, plumbing work for temporary housing hospital group at Ft. Jay, New York, \$8993.

Gregory, W. T., Norfolk, Va., temporary housing (hospital), Ft. Story, Virginia, \$397,351.

Haven Busch Co., Grand Rapids, Mich., steel tower stairways, Barksdale field, Louisiana, \$3045.

Mack-International Motor Truck Corp., Long Island City, N. Y., Trucks, \$23,430.

Marsh, James P., Corp., Chicago, 34,000 component parts for field ranges, \$46,580.

McKee, Robert E., Los Angeles, barracks at Schofield barracks, Hawaii, \$348,700.

Meyne, Gerhardt F., Co., Chicago, temporary buildings, Ft. Sheridan, Illinois, \$1,076,917.

Miller, A. J., Auto Cruiser Trailer Co., Bradenton, Fla., trailers, \$485,145.86.

Mlon Construction Co., Atlanta, Ga., hospital buildings and boiler house, Ft. Benning, Georgia, \$933,089.

Moeller, H. H., Co., San Antonio, Tex., engine repair shop, Duncan field, Texas, \$320,677.

Petry, N. G., Denver, temporary housing facilities, Ft. Logan, Colorado, \$115,645.

Protectosal Co. of America Inc., Chicago, 8500 gasoline cans, \$20,060.

Quisic & Andrews, Ft. Worth, Tex., repair dock, Duncan field, San Antonio, Tex., \$290,100.

Sand, H., & Co. Inc., New York, heating work for temporary housing hospital group at Ft. Jay, New York, \$31,374.

Weddle, E. E., Norfolk, Va., mobilization housing, Camp Pendleton, Virginia Beach, Va., and Ft. Story, Virginia, \$1,188,081.

Air Corps Awards

Air Cruisers Inc., Clifton, N. J., apparatus, \$62,300.

American Gas Accumulator Co., Elizabeth, N. J., trucks, \$153,948.

Bell Aircraft Corp., Buffalo, adapters, \$229,245.

Bendix Aviation Corp., Eclipse Aviation division, Bendix, N. J., maintenance parts, \$294,474; Pioneer Instrument division, Bendix, N. J., assemblies, \$308,000.

Boeing Aircraft Co., Seattle, fuel tanks, \$249,015.

Bradford Machine Tool Co., Cincinnati, lathes, \$241,735.

Cole, H., Co., Columbus, O., compasses, \$112,000.

Curtiss-Wright Corp., Curtiss Aeroplane division, Buffalo, maintenance parts, \$53,519.21; Curtiss Propeller division, Clifton, N. J., assemblies, \$76,475.

Gosiger, C. H., Machine Co., Dayton, O., lathes, \$240,109.80.

International Engineering Inc., Dayton, O., assemblies, \$65,022.25.

Kidde, Walter, & Co. Inc., New York, extinguishers, \$275,605.80.

Laskin, J., & Sons Corp., Milwaukee, shearing, \$350,370.

Magnaflux Corp., Chicago, apparatus, \$180,962.40.

Ohio Chemical & Mfg. Co., Cleveland, masks, \$30,618.

Pausin Engineering Co., Newark, N. J., colls, \$60,588.

Premium Cap Co., St. Louis, caps, \$54,000.

Republic Aviation Corp., Farmingdale, Long Island, N. Y., maintenance parts, \$103,804.89.

Service Tool & Engineering Co., Dayton, O., slight assemblies, \$154,000.

United Aircraft Corp., Pratt & Whitney Aircraft division, East Hartford, Conn., maintenance parts, \$1,476,946.17.

Webster Electric Co., Racine, Wis., sole-noid assemblies, \$116,298.

York Ice Machinery Corp., Cleveland, coolers, \$13,176.

Navy department announced the following awards:

American Locomotive Co., Auburn, N. Y., nine sets of propelling machinery for minesweepers, \$5,299,890.

Edo Aircraft Corp., College Point, Long Island, N. Y., \$365,000 for acquisition and construction of additional plant facilities and equipment; 47,000 square feet of floor space to be added, 40,000 square feet for production of seaplane floats.

Footo Bros. Gear & Machine Corp., Chicago, expansion of company's plant by construction of additional 125,000 square feet of floor space for manufacture of airplane engine gears; estimated \$1,020,000 for acquisition of additional land and buildings and installation of machinery and plant equipment

United Aircraft Corp., East Hartford, Conn., \$18,160,746 for acquisition, construction and installation of additional

plant facilities at three of the corporation's plants. Expansions planned; \$1,761,746 for additional plant facilities at East Hartford and Pawcatuck, Conn., units of Hamilton Standard Propellers division; \$1,600,000 for additional facilities at Stratford, Conn., plant of Vought-Sikorsky Aircraft division; and \$14,709,000 for additional facilities at East Hartford plant of Pratt & Whitney Aircraft division.

Bureau of Supplies and Accounts Awards

Aluminum Cooking Utensil Co., New Kensington, Pa., jacketed steam kettles, \$80,021.90.

American Holst & Derrick Co., St. Paul, snatch blocks, \$13,995.62.

American Metal Co. Ltd., New York, pig lead, pig tin, \$206,051.

American Smelting & Refining Co., Federated Metals division, San Francisco, pig lead, \$13,133.50.

Anaconda Wire & Cable Co., New York, electric cable, \$40,320.30.

Purchases Under Walsh-Healey Act

(In Week Ended Nov. 30)

Iron and Steel Products	Commodity	Amount
American Bridge Co., Denver	Structural steel	\$11,992.00
American Car & Foundry Co., New York	Bomb parts, forgings	6,079,200.00
American Chain & Cable Co. Inc., Reading, Pa.	Valves	27,383.07
American Hardware Corp., New Britain, Conn.	Locks	23,550.00
Anchor Post Fence Co., Baltimore	Fence	41,912.00
Armco International Corp., New York	Drain pipe	22,779.96
Atlas Machine & Iron Works, Washington	Weldments	16,950.00
Babcock & Wilcox Tube Co., Beaver Falls, Pa.	Boiler tubes	28,457.89
Barcalo Mfg. Co., Buffalo	Cot braces	13,505.00
Bayonne Steel Barrel Co., Bayonne, N. J.	Steel barrels	79,000.00
Bethlehem Steel Co., San Francisco	Steel structures	72,580.83
Bunell Machine & Tool Co., Cleveland	Wrenches	16,353.40
Cahn, A. L., & Sons Inc., New York	Ladles, skimmers	26,891.25
Camden Forge Co., Camden, N. J.	Forgings	70,224.00
Camillus Cutlery Co., New York	Knives	22,327.37
Carlin, Anthony, Co., Cleveland	Steel rivets	*8,737.50
Carnegie-Illinois Steel Corp., Chicago	Steel, steel sheets, piling	69,349.15
Clemson Bros. Inc., Middletown, N. Y.	Sawblades	13,650.00
Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.	Revolver parts	14,373.00
Columbus McKinnon Chain Corp., Tonawanda, N. Y.	Tow chains	25,586.59
Columbus Steel Industries, Columbus, O.	Used pipe	19,380.00
Crane Co., Chicago	Steel valves	37,946.50
Detroit-Michigan Stove Co., Detroit	Ranges	46,950.00
DeVilbiss Co., Toledo, O.	Motor maintenance equipment	75,919.63
Empire Machinery & Supply Corp., Norfolk, Va.	Valves	15,672.00
Estate Stove Co., Hamilton, O.	Ranges	132,750.00
Fischer, Charles, Spring Co., Brooklyn, N. Y.	Rifle parts	11,141.00
Forsberg Mfg. Co., Bridgeport, Conn.	Screwdrivers	10,328.95
Geuder, Paeschke & Frey Co., Milwaukee	Box assemblies	20,090.00
Hudgins, R. W., & Son, Norfolk, Va.	Extracting tools	10,254.00
Hurd-Pohlmann Co. Ltd., Honolulu, T. H.	Ovens, kettles	12,358.00
International Engineering Inc., Dayton, O.	Stand assemblies	65,022.25
Kay Products Co., Detroit	Cradle assemblies	11,400.00
Lakeside Bridge & Steel Co., Milwaukee	Gantry cranes	183,900.00
LaLance & Grosjean Mfg. Co., Long Island, N. Y.	Pans, colanders	31,921.61
Louisville Tin & Stove Co., Louisville, Ky.	Stove pipe	17,750.00
McCambridge Co., Philadelphia	Plumbing fixtures	11,607.68
McKay Co., York, Pa.	Tow chains	219,324.68
Marshall Stove Co., Lewisburg, Tenn.	Stoves	60,760.00
Matthews Mfg. Co., Worcester, Mass.	Booster casings	14,766.35
Mercury Aircraft Inc., Hammondsport, N. Y.	Wrenches	18,900.90
Mine & Smelter Supply Co., Denver	Water pipe	*30,746.28
Mosler Safe Co., Hamilton, O.	Safes	14,415.00
Norris Stamping & Mfg. Co., Los Angeles	Band assemblies	187,842.00
North & Judd Mfg. Co., New Britain, Conn.	Clips, buckles	10,726.20
Ohio Injector Co., Wadsworth, O.	Valves	60,042.67
O'Leary, Arthur J., & Son Co., Chicago	Trash racks	15,300.00
Parkersburg Iron & Steel Co., Parkersburg, W. Va.	Stove pipe	30,390.00
Paxton & Vierling Iron Works, Omaha, Nebr.	Structural steel	17,145.00
Phillips & Buttorff Mfg. Co., Nashville, Tenn.	Heating stoves	22,645.45
Prentice, G. E., Mfg. Co., New Britain, Conn.	Clips, buckles	14,878.65
Quincy Stove Mfg. Co., Quincy, Ill.	Stoves	18,600.00
Remington Arms Co. Inc., Bridgeport, Conn.	Rifle parts	48,000.00
Rheem Mfg. Co., Richmond, Calif.	Fin assemblies	326,541.00
Robertshaw Thermostat Co., Youngwood, Pa.	Booster parts	270,249.00
Roebing's, John A., Sons Co., Trenton, N. J.	Wire cloths	35,842.50
Ryerson, Joseph T., & Son, Inc., Chicago	Reinforcement bars	28,746.88
Scrimgeour, Wm., Washington	Knives, utensils	90,205.70
Steel Products Engineering Co., Springfield, O.	Wrenches	22,103.85
St. Paul Foundry Co., St. Paul	Stairways	20,211.00
Townsend, Samuel P., Lawn Mower Co., Bloomfield, N. J.	Shipping assemblies	34,572.00

*Estimated.

Austin-Hastings Co. Inc., Cambridge, Mass., radial drills, \$58,500.
 Babcock & Wilcox Co., New York, boilers, boiler tubes, \$189,088.85.
 Bausch & Lomb Optical Co., Rochester, N. Y., ship telescopes, \$5296.
 Bendix Aviation Corp., Eclipse Aviation division, Bendix, N. J., generators and control boxes, \$32,716.50.
 Benson, L. A., Co. Inc., Baltimore, carbon steel twist drills, \$46,481.76.
 Bernz, Otto, Co. Inc., Rochester, N. Y., gasoline torches, \$6204.78.
 Buda Co., Harvey, Ill., diesel engines, \$1,304,988.10.
 Burns, Jabez, & Sons Inc., New York, coffee roasting, cooling, stoning and grinding unit, \$25,586.
 Butterworth System Inc., Bayonne, N. J., Butterworth tank cleaning system, \$9762.
 Chase Brass & Copper Co. Inc., Waterbury, Conn., condenser tubes, \$24,543.61.
 Chelsea Clock Co., Chelsea, Mass., deck clocks, \$22,150.

Cincinnati Bickford Tool Co., Cincinnati, upright drilling machines, \$7696.50.
 Circle Wire & Cable Corp., Maspeth, Long Island, N. Y., electric cable, \$55,209.83.
 Collyer Insulated Wire Co., Pawtucket, R. I., electric cable, \$27,888.72.
 Crane Co., Chicago, main steam line valves, \$40,013.
 Crescent Insulated Wire & Cable Co., Trenton, N. J., electric cable, \$27,700.
 Crucible Steel Co. of America, New York, cutters (bits), \$12,273.23.
 Earle Gear & Machine Co., Philadelphia, dummy car trucks and wheels, \$19,132.
 Ekstrom, Carlson & Co., Rockford, Ill., tools, jigs and fixtures, \$20,056.77.
 Elliott Co., Ridgway, Pa., parts for main generators, \$11,282.31.
 Fairchild Aviation Corp., Jamaica, N. Y., photographic laboratories, \$10,713.50; Fairchild Aircraft division, Hagerstown, Md., airplanes, \$24,603.
 Flemm Lead Co. Inc., Long Island City, N. Y., sheet lead, \$13,139.18.

Florence Pipe Foundry & Machine Co., Philadelphia, hydraulic flanging press, \$19,170.
 General Cable Corp., New York, electric cable, \$203,973.46.
 General Electric Co., Schenectady, N. Y., locomotives, main generators, \$140,298.55.
 General Time Instruments Corp., Thomaston, Conn., boat clocks, \$12,450.
 Glesener, A. J., Co., San Francisco, carbon steel twist drills, \$19,159.86.
 Harrington Co., Philadelphia, chain hoists, \$27,294.40.
 Heald Machine Co., Worcester, Mass., grinding machine, \$6419.
 Hobbs, Clinton E., Co., Everett, Mass., chain hoists, \$21,565.29.
 International Silver Co., New York, tableware, \$213,650.
 Linde Air Products Co., New York, oxy-acetylene torches, \$17,004.
 Lodge & Shipley Machine Tool Co., Cincinnati, engine lathes, precision lathe, \$83,609.
 Logan Co., Louisville, Ky., hospital beds, \$39,360.
 Maddock & Co., Philadelphia, carbon steel twist drills, \$10,928.43.
 Manning Maxwell & Moore Inc., Jersey City, N. J., carbon steel twist drills, gages, planes and squares, \$51,186.13.
 Master Rule Mfg. Co. Inc., Bronx, N. Y., multiple folding rules, \$14,194.56.
 Motley, James M., & Co. Inc., New York, rotary shear, \$20,995.
 Milburn, Alexander, Co., Baltimore, oxy-acetylene torches, \$46,060.
 Millers Falls Co., Greenfield, Mass., calipers, dividers, gages, planes and squares, \$16,817.23.
 Motor Tool Mfg. Co., Detroit, tools, jigs and fixtures, \$42,319.69.
 National Battery Co., Gould Commercial division, Depew, N. Y., storage batteries, \$48,057.10.
 National Forge & Ordnance Co., Irvine, Pa., steel crankshafts, \$12,250.
 National Lead Co., Baltimore, sheet lead, \$30,569.39.
 National Tube Co., Pittsburgh, steel air flasks, boiler tubes, \$65,210.99.
 National Twist Drill & Tool Co., Detroit, twist drills, \$455,140.93.
 New Haven Clock Co., New Haven, Conn., experimental clock switches, \$5000.
 New Method Steel Stamps Inc., Detroit, steel gages and letters, \$38,386.15.
 Nevins, Henry B., Inc., New York, motor mine sweepers, \$1,443,476.08.
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., vertical shapers, \$10,684.
 Noland Co. Inc., Washington, carbon steel twist drills, \$12,095.82.
 Northern Pump Co., Minneapolis, class N-2 diesel oil transfer pumps, \$5865.
 Northwest Lead Co., Seattle, sheet lead, \$13,408.20.
 Okonite Co., Passaic, N. J., electric cable, \$27,814.72.
 Packard Motor Car Co., Detroit, servicing, repair or overhaul of marine engines, \$75,000.
 Perine Machinery & Supply Co. Inc., Seattle, beveling machine, \$5750.
 Prentice, G. E., Mfg. Co., New Britain, Conn., automatic fasteners, \$26,445.
 Reed & Barton, New York, tableware, \$67,510.
 Reed Small Tool Works, Worcester, Mass., callipers and gages, \$12,772.78.
 Revere Copper & Brass Inc., Baltimore division, Baltimore, condenser tubes, \$34,976.94.
 Sargent & Co., New Haven, Conn., planes, \$7178.05.
 Schroeder Bros. Mfg. Co., Torrington, Conn., hacksaw frames, \$5602.94.
 Smith-Courtney Co., Richmond, Va., carbon steel twist drills, \$15,570.30.
 Standard Shannon Supply Co., Philadelphia, carbon steel twist drills, \$12,227.31.

Purchases Under Walsh-Healey Act (Cont.)

Iron and Steel Products

Taylor Engineering & Mfg. Co., Allentown, Pa.
 United States Pipe & Foundry Co., East Burlington, N. J.
 U. S. Automatic Corp., Amherst, O.
 Utica Drop Forge & Tool Corp., Utica, N. Y.
 Wackman Welded Ware Co., St. Louis
 Wallace, R., & Sons Mfg. Co., Wallingford, Conn.
 Welker Mfg. Co. Inc., Cromwell, Conn.
 Widin Metal Goods Co., Garwood, N. J.
 Wire Rope Mfg. & Equipment Co., Seattle
 Zimmer Splint Co., New York

Commodity

Amount

Rails	\$17,952.00
Cast iron pipe	26,121.00
Closing plugs	35,127.00
Pliers	75,215.00
Tent stoves	47,000.00
Knives, spoons	82,408.70
Buckles	22,362.48
Mast base	70,871.64
Wire rope	40,280.40
Litters	176,100.00

Nonferrous Metals and Alloys

Aluminum Co. of America, Pittsburgh
 American Brass Co., Waterbury, Conn.
 Anaconda Sales Co., New York
 Bohn Aluminum & Brass Corp., Detroit
 Gray, Peter, Corp., Cambridge, Mass.
 National Lead Co., Baltimore
 National Pneumatic Co. Inc., Rahway, N. J.
 Neu-Bart Stamping & Mfg. Co., Los Angeles
 Revere Copper & Brass Inc., Baltimore
 Scovill Mfg. Co., Waterbury, Conn.
 Veeder-Root Inc., Hartford, Conn.
 Vernon Co., New York
 West Bend Aluminum Co., West Bend, Wis.

Aluminum rivets	\$18,259.93
Cartridge cups	90,824.50
Copper ingots	14,610.00
Fuse parts	48,845.50
Stampings	12,490.25
Casting metal	10,437.50
Fuse parts	110,037.00
Utensils	14,491.80
Brass	59,353.32
Cartridge cups	69,000.00
Cipher devices	22,399.00
Clips	14,868.34
Utensils	13,326.48

Machinery and Other Equipment

American Laundry Machinery Co., Cincinnati
 Bird-White Corp., Chicago
 Bliss, E. W., Co., Brooklyn, N. Y.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Caterpillar Tractor Co., Peoria, Ill.
 General Motors Corp., Harrison Radiator division, Lockport, N. Y.
 General Motors Sales Corp., Frigidaire division, New York
 General Railway Signal Co., Rochester, N. Y.
 Gibbs, Thomas B., & Co., Delavan, Wis.
 Gleason Works, Rochester, N. Y.
 Gosiger, C. H., Machine Co., Dayton, O.
 Harrington Co., Philadelphia
 Hendey Machine Co., Torrington, Conn.
 Hoe, R., & Co. Inc., New York
 Ingersoll-Rand Co., New York
 Jeffrey Mfg. Co., Columbus, O.

Ironers, tumblers	\$10,578.00
Pump assemblies	43,645.00
Coin presses	16,110.00
Milling machines	32,879.20
Tractors	22,805.00
Heat exchangers	12,495.35
Refrigerators	23,400.00
Machining	4,375,000.00
Turning machines	300,000.00
Gear generators	10,672.30
Chain hoists	10,028.00
Chain hoists	10,530.00
Lathes	35,630.00
Recoil mechanisms	3,014,750.20
Air compressors	14,855.00
Cement handling system	19,210.00
Turret lathes	23,277.90
Lathes, shapers	504,151.50
Water supply systems	23,600.00
Lathes	16,105.00
Steam gypsies	13,264.00
Twist drills	13,170.00
Jig borers, lathes, profiling machines	327,907.50
Filters	11,908.00
Recoil mechanism	2,722,679.96
Drilling machines	29,408.94
Cards, rolls	44,730.00
Engine parts	38,578.25
Ventilating fans	34,378.00
Machine tools	25,000.00
Shovel	19,735.00
Twist drills	65,092.64
Laundry presses	11,981.00
Buffers	23,734.60
Twist drills	58,265.14
Machinery	20,962.00

Jones & Lamson Machine Co., Springfield, Vt.
 Kinsey, E. A., Co., Cincinnati
 Layne-New York Co. Inc., New York
 LeBlond, R. K., Machine Tool Co., Cincinnati
 Markey Machinery Co. Inc., Seattle
 National Twist Drill & Tool Co., Detroit
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn.
 Oliver United Filters Inc., New York
 Otis Elevator Co., New York
 Prentiss, Henry, & Co. Inc., New York
 Saco-Lowell Shops, Boston
 Snow & Petrelli Mfg. Co., New Haven, Conn.
 Stone Heating & Ventilating Co., Washington
 Studebaker Corp., South Bend, Ind.
 The Shovel Co., Lorain, O.
 Union Twist Drill Co., Athol, Mass.
 Unbress Co. Inc., Minneapolis
 Valley Electric Corp., St. Louis
 Wesson Co., Detroit
 Willamette Iron & Steel Corp., Portland, Ore.

(Please turn to Page 62)

Defense Program Speeds Drive For Uniform Truck Regulations

WASHINGTON ■ BECAUSE of the national defense program there is every indication removal of interstate trade barriers through adoption of uniform truck laws may become effective in the near future. If it had not been for the present emergency, any such uniform laws might have been postponed almost indefinitely.

Congress, the interstate commerce commission and the department of commerce are working on this problem. Laws vary in different states so that trucks legal in one state are not legal in another. Great variation exists in provisions as to total weight, length of trucks and similar features. Uniformity in laws governing use of highways is particularly important now because trucks are serving government contractors and subcontractors.

Interstate commerce commission, at the request of congress, has made an extensive investigation into this subject.

Railroads, also vitally interested, are of the opinion federal regulation of sizes and weight of motor vehicles "moving in interstate commerce is neither necessary nor de-

sirable in public interest." American Trucking Associations Inc. has filed a brief with the commission urging it to recommend to congress that there is a need for federal intervention, but the trucking association opposes congressional establishment of specific size and weight limits. Association takes the view the situation calls for legislation under which the interstate commerce commission might alter state legislation gradually. Such legislation would authorize the commission to act, following petitions filed against a state law or regulation and hearings before a joint board. The trucking association charges railroads have sponsored state laws and regulations that allegedly hamper interstate motor transportation.

House Committee Urges Uniformity

Meanwhile, house committee on interstate trade barriers and unemployment has made public a report compiled by its subcommittee. The committee recommends congress amend the federal aid for highways authorization act to provide that after the next regular meeting of its legislature "no state shall par-

ticipate in said fund which shall not have adopted the uniform weights, measurements and specifications for all motor vehicles which shall travel federal-aid highways as set up in said act and until there shall be enacted the uniform highway code as provided therein."

Committee further recommends congress enact a uniform law "but provide that a motor vehicle license issued in one state shall be good in all states, subject only to regulations of the interstate commerce commission as applied to vehicles engaged in interstate commerce; and provide that such legislation shall take into account the debt obligations of several states."

Paul T. Truitt, chairman of the interdepartmental committee on interstate trade barriers of the department of commerce, is making an intensive study of this situation.

Output of Abrasive Wheels Geared to Defense Needs

■ Results of a survey of production capacity in the grinding wheel industry to meet defense requirements have been announced. This survey was made under direction of an industry defense committee which was organized in June, 1940. It shows the industry has ample reserve facilities which will enable it, through a planned production schedule, to keep well ahead of demands.

The industry at present has 82 per cent excess productive capacity over its current rate of operation. Furthermore, the survey indicates that its all-time peak can be exceeded by as much as 101 per cent on six months' notice.

The grinding wheel committee of the industry, in co-operation with the tool section of the national defense commission, has worked out and put into operation a plan which will insure an adequate flow of wheels and other abrasive tools. This flow not only will be of known overall volume, but it has been planned to cover the necessary number of specific shapes and sizes of wheels, etc., which will be required by individual manufacturers to produce the defense materiel already contracted for and planned for future production.

It is urged that users of grinding wheels and other abrasive tools co-operate in this defense project by placing orders well in advance of the time when they will be required. Order quantities, as far as delivery dates are concerned, should be restricted closely as possible to the "near term demand" so that an orderly flow of abrasives to users contributing to defense production will not be impeded.

Steel Post Wins in Tug-of-War



■ Before steel posts were installed for guard rail supports on the new Harrisburg-Pittsburgh turnpike, the tug-of-war, shown above, was staged between wood and steel posts. At the first test, the steel post had tipped only $\frac{3}{8}$ -inch while the wood post had moved $2\frac{1}{2}$ inches. When the tip of the steel post had increased to $2\frac{3}{4}$ inches, the wood post had yielded entirely. Steel post was driven while the wood post was set in well-tamped earth. Steel post employed was a standard Bethlehem $7\frac{1}{4}$ -pound section

Map Steel Plant Expansion To Be Required by Higher U. S. Income

■ SHOULD consumer income in 1941 reach \$83,000,000,000 (based on 1936 dollars) the steel industry would have to expend \$315,960,000 on new equipment to satisfy demand created by increased purchasing power. Should the consumer income be \$89,000,000,000, the capital outlay in steel must be \$720,170,000; an income of \$94,000,000,000 would demand an outlay of \$1,217,565,000.

These are conclusions of a study by Louis J. Paradiso, under the direction of Gardner C. Means, prepared for the industrial committee of the national resources committee, released by the National Resources Planning Board, Washington. The 54-page pamphlet is entitled *Capital Requirements—a Study in Methods as Applied to the Iron and Steel Industry*, computed as of 1939.

Study is a highly theoretical one and the publication is a "preliminary edition for technical criticism." Somewhat complex formulas are used, based on facts observed over a long period of years, with the assumption that the future will be molded on the past. The authors admit estimates in the study are liable to a wide margin of error.

Assuming an income of \$83,000,000,000 in 1941, the treatise concludes that the over-all facilities of the steel industry would be sufficient

to satisfy buying power, but due to imperfectly balanced units the industry would have to spend money for eliminating bottlenecks. With an income of \$89,000,000,000 even the over-all equipment would not be sufficient.

A consumer income in 1941 of \$94,000,000,000 presupposes all available workers would be employed. An income of \$89,000,000,000 would mean that about 2,000,000 would be unemployed; an income of \$83,000,000,000 assumes 4,700,000 unemployed.

Consumer Income Defined

Consumer income is measured by wages, salaries, dividend and interest payments, and includes non-corporate business savings. It is equivalent to national income, excluding corporate business savings, as these terms are defined by the department of commerce.

The treatise estimates the iron and steel industry would have available for investment in capital equipment by 1941, from internal sources, approximately \$482,000,000, consisting of the estimated depreciation charged off and undistributed profits. This sum is more than adequate to cover the costs of the additional equipment of \$316,000,000 required for the \$83,000,000,000 consumer income level. However it

falls short of the amounts required in the case of the 89- and 94-billion dollar income levels, in which case the industry would have to resort to outside financing.

Total of 81,100,000 gross tons of iron ore would be required for consumption in 1941, with an income of \$83,000,000,000; 96,900,000 tons of ore, with an income of \$89,000,000,000; 112,000,000 tons of ore, with an income of \$94,000,000,000.

Pig iron capacities of 48,000,000, 56,800,000 and 65,000,000 tons, respectively, would be needed for the same three income groups. Open-hearth capacity requirements would be 70,200,000, 81,600,000 and 91,900,000 gross tons, respectively.

Rolled steel capacity required to satisfy these three groups of incomes would be 51,600,000, 59,800,000 and 67,400,000 tons, respectively, or increases over estimated practical capacity as of the end of 1940 of 2,600,000, 5,700,000 and 11,600,000 tons, respectively.

Additional rated capacity required at the various consumer income levels summarized, in millions of gross tons:

	83- billion dollar level	89- billion dollar level	94- billion dollar level
Ore ships	none	7.0	22.0
By-product coke ovens	none	5.2	12.8
Blast furnaces	6.6	16.5	25.7
Ferroalloy furnaces	0.3	0.5	0.7
Open-hearth furnaces	15.3	28.1	39.6
Electric furnaces	0.1	0.3	0.6
Rolling mills	2.6	5.7	11.6

The study also goes into considerable detail over principal forms of rolled steel. For the \$83,000,000,000 income level about 2,000,000 gross tons of additional capacity for making sheets would be required; 200,000 tons of tin plate and black plate and 400,000 tons for strip.

Only in three finished steel classifications, wire products, rails and "all other" are present facilities sufficient to take care of an income of \$94,000,000,000.

General Electric Shows Construction Materials

■ General Electric Co.'s construction materials division displayed its complete line of products to 150 business paper editors and representatives at a country fair party at the General Electric institute, Bridgeport, Conn., Nov. 15.

Materials in the process of manufacture, in test chambers, and finished products were shown. H. L. Andrews, vice president and manager of the appliance and merchandise department, and J. H. Crawford, manager of the construction materials sales division, welcomed the visitors with brief talks preceding the fair's opening. H. E. Merrill, construction materials advertising manager, was in charge of the fair.

Low-Alloy, High-Tensile Steel for Snow Plow Blade



■ Familiar scene in many parts of the country: Diesel-powered, "motor grade" made by Caterpillar Tractor Co., Peoria, Ill. The V-shaped blade which forces snow to either side of the road is low-alloy, high tensile steel made by Republic Steel Corp., Cleveland

Wanted: A Policy and a Head Man!

■ **CURRENT DEBATE** on the amount of steelmaking capacity required for defense involves problems which go right to the heart of national policy.

Some government officials, acting largely upon the advice of their economists, declare that existing capacity for producing and finishing steel will fall far short of meeting the demand which will arise in 1941 or 1942. They are exerting strong influence upon the National Defense Advisory commission and upon the industry itself to start now to increase capacity drastically.

Many executives in the iron and steel industry believe that the amount of increase urged by certain government officials is excessive. Nevertheless, the difference in opinion has not resulted in a stalemate. In the give and take between government and industry, certain companies have authorized new construction which will increase national capacity appreciably.

* * *

However, the debate involves much more than the tonnage of new steelmaking capacity required. It opens up the broad question of defense economy.

Will this nation continue to view defense as a job which must be carried on without disturbing any existing non-defense activities, or will it set up defense as the No. 1 objective which will take precedence over everything else?

Thus far the administration's attitude has seemed to favor the first-named policy. Numerous government spokesmen talk as if they were definitely committed to a business-as-usual defense program. They envision a situation wherein the defense activities are simply piled on top of all

ordinary peacetime activities. They ask that capacity be provided to take care of the peak load, even though it be of short duration.

Many industrialists feel that some normal activities could be scaled down moderately so as to make a greater portion of existing capacity available for defense work. This would economize in money, materials and manpower. It would also permit of an easier adjustment to peacetime conditions when the emergency ends.

* * *

The mere fact that this question of broad policy has not been decided officially and that it is being debated publicly so freely is a sign of alarming weakness in the present defense organization at Washington.

If the existing so-called defense commission had been organized properly, with a responsible head—as in the case of the War Industries board in World War days—a definite policy on defense economy would have been established months ago. Somebody comparable to Bernard M. Baruch would have demanded and received from the administration a clear-cut statement of policy. The question of business-as-usual or priority for defense would have been settled long ago, and capacities for all essential defense materials would have been mapped out accordingly.

Much of the present confusion can be traced directly to the faulty organization of defense authority in Washington. Give it a definite policy and a competent head, and it will function smoothly.

E. L. Shaner

The BUSINESS TREND



Activity Index Records

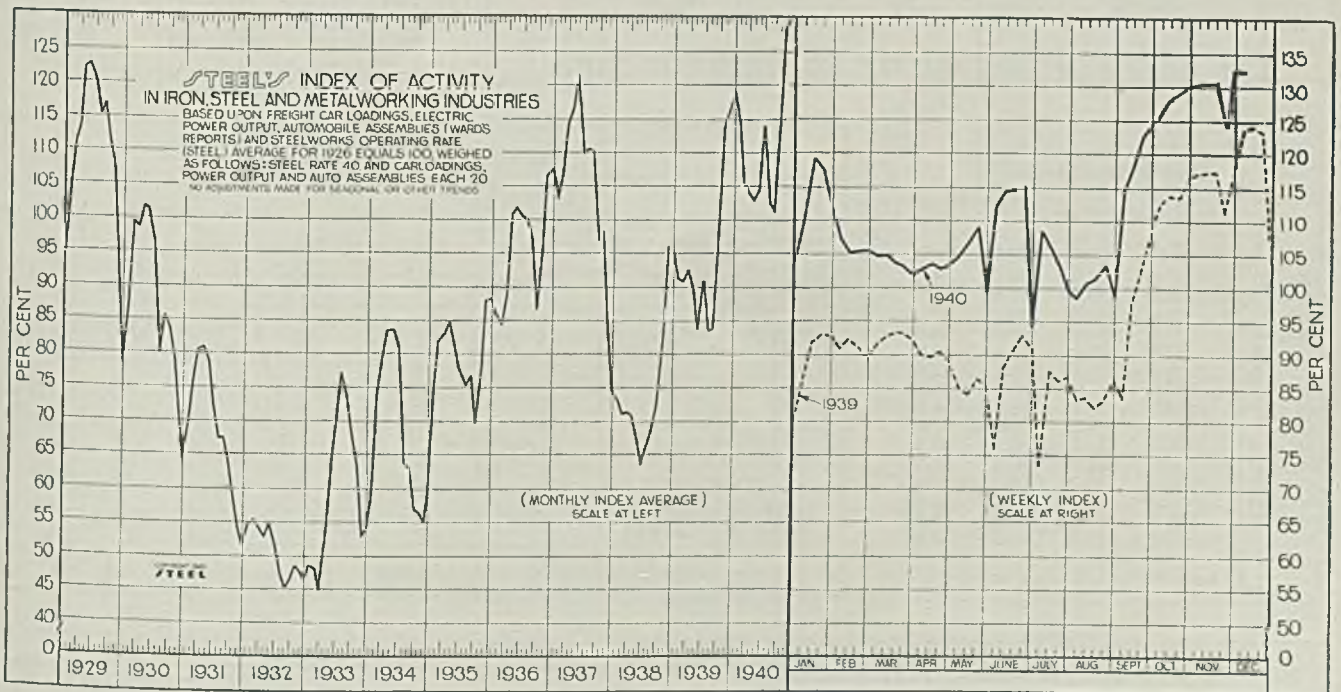
Slight Decline

■ TREND of activity in capital goods industries appears to be leveling off, close to capacity. Large orders already booked, plus those in prospect should sustain industrial output at current rates well into 1941. Numerous plant expansions scheduled for completion in the near future are the forerunners of increased production.

The average of STEEL's weekly index for November was 129.5, a gain of 1.7 points over 127.8, the October index average. The November average was the highest ever recorded by the index. In the same

month a year ago, the index averaged 116.2, while in November, 1938 it was 95.9.

Reflecting the seasonal decline in automobile production during the week of Dec. 7, STEEL's index eased 0.1 point to 132.5. Excluding Thanksgiving and Labor day weeks, this represents the first decline in the index since the week ended Aug. 10. Revenue freight traffic advanced slightly during the latest period, while electric power consumption again advanced, to an all-time peak. The national steel rate and automobile output were moderately lower.



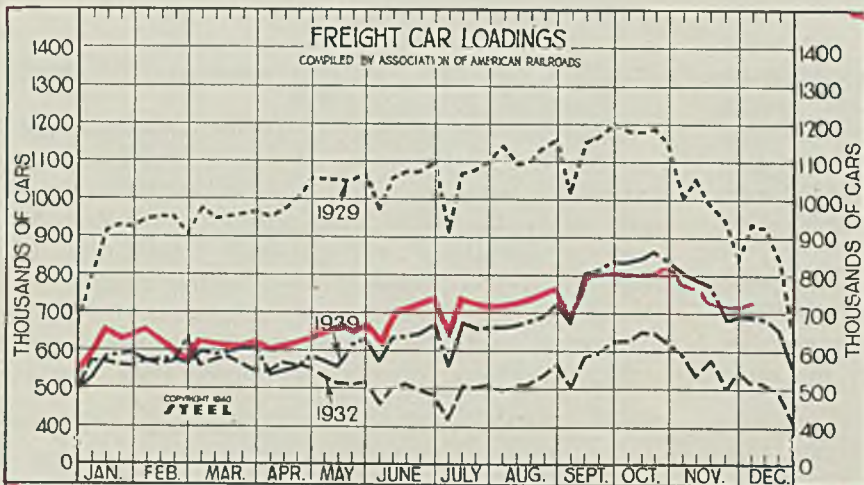
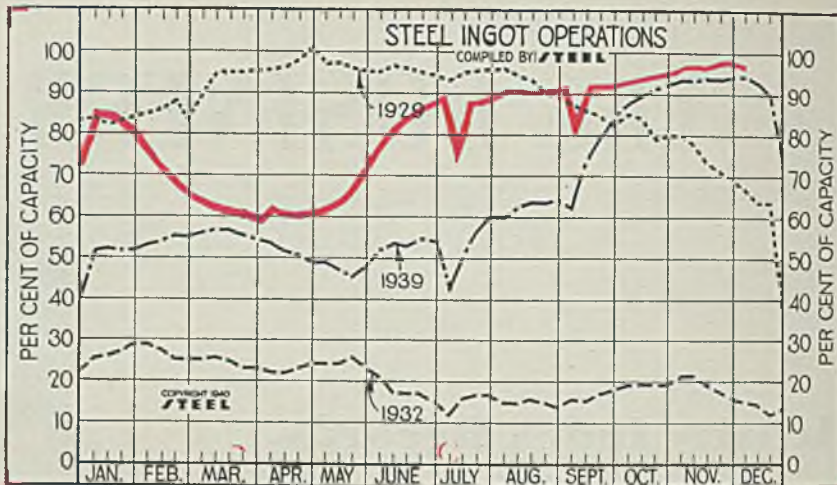
STEEL'S index of activity declined 0.1 points to 132.5 in the week ended Dec. 7:

Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Sept. 21	117.7	103.0	Jan.	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Sept. 28	122.8	107.9	Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
Oct. 5	124.4	112.5	March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
Oct. 12	126.0	113.9	April	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
Oct. 19	128.3	113.6	May	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
Oct. 26	129.9	116.2	June	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
Nov. 2	130.2	117.1	July	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Nov. 9	130.3	117.2	Aug.	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Nov. 16	130.3	117.3	Sept.	113.5	93.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Nov. 23	124.7	111.4	Oct.	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov. 30	132.6	117.9	Nov.	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec. 7	132.5	123.9	Dec.	.....	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

Steel Ingot Operations

(Per Cent)

Week ended	1940	1939	1938	1937
Aug. 24	90.5	63.5	43.5	83.0
Aug. 31	91.5	64.0	44.5	83.0
Sept. 7	82.0	62.0	41.5	72.0
Sept. 14	93.0	74.0	46.0	80.0
Sept. 21	93.0	79.5	48.0	76.0
Sept. 28	93.0	84.0	47.0	74.0
Oct. 5	93.5	87.5	48.5	66.0
Oct. 12	94.5	89.5	51.5	63.0
Oct. 19	95.0	91.0	51.5	53.0
Oct. 26	95.5	92.0	54.5	51.0
Nov. 2	96.5	93.0	57.5	47.0
Nov. 9	96.5	93.0	61.5	39.0
Nov. 16	96.0	93.5	63.0	35.0
Nov. 23	97.0	93.5	62.0	31.5
Nov. 30	97.0	94.0	61.0	30.5
Dec. 7	96.5	94.0	61.0	27.0



Freight Car Loadings

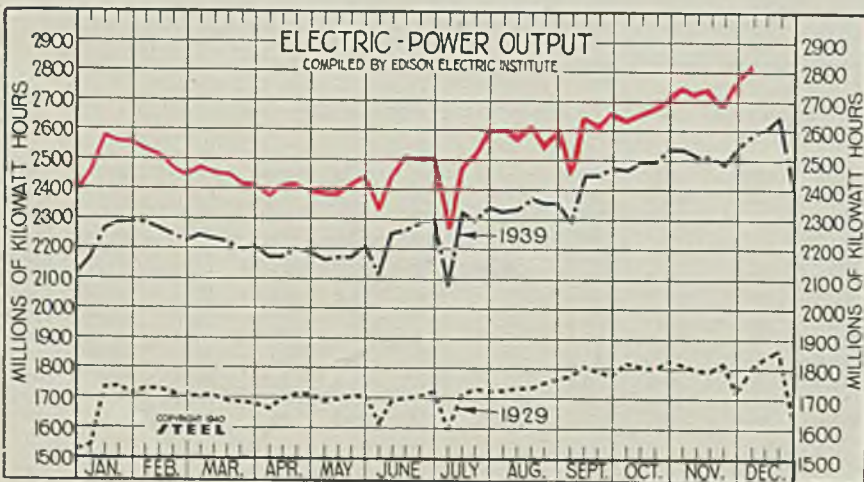
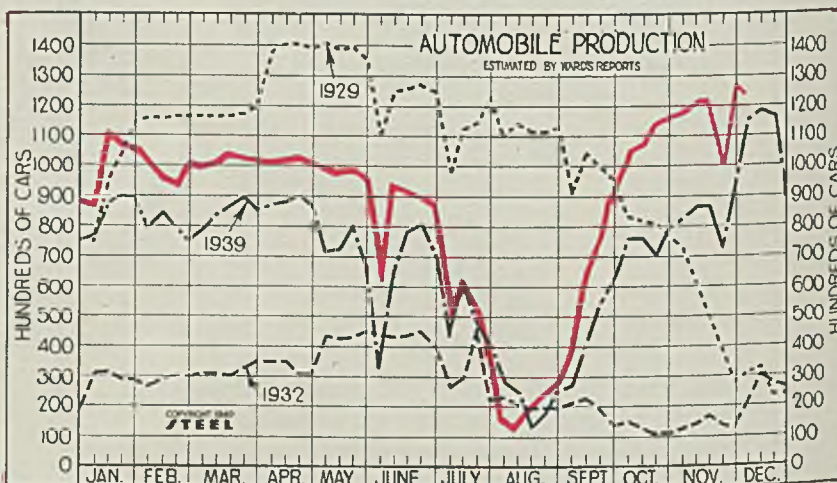
(1000 Cars)

Week ended	1940	1939	1938	1937
Aug. 31	769	722	648	805
Sept. 7	695	667	569	711
Sept. 14	804	806	660	827
Sept. 21	813	815	676	840
Sept. 28	822	835	698	847
Oct. 5	806	835	703	815
Oct. 12	812	845	727	810
Oct. 19	814	861	706	773
Oct. 26	838	834	709	772
Nov. 2	795	806	673	732
Nov. 9	778	786	637	690
Nov. 16	745	771	657	647
Nov. 23	733	677	562	559
Nov. 30	729	689	649	623
Dec. 7	739	687	619	622

Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
Aug. 31	27.6	25.2	22.2	64.2
Sept. 7	39.7	26.9	17.5	59.0
Sept. 14	66.6	41.2	16.1	30.1
Sept. 21	78.8	53.9	20.4	28.0
Sept. 28	95.9	62.8	25.4	45.8
Oct. 5	105.2	76.1	37.7	72.0
Oct. 12	108.0	75.9	50.5	89.7
Oct. 19	114.7	70.1	68.4	91.9
Oct. 26	117.1	78.2	73.3	90.2
Nov. 2	118.1	82.7	80.0	89.8
Nov. 9	120.9	86.2	86.3	85.3
Nov. 16	121.9	86.7	96.7	85.8
Nov. 23	102.3	72.5	84.9	59.0
Nov. 30	128.8	93.6	97.8	86.2
Dec. 7	124.8	115.5	100.7	85.8



Electric Power Output

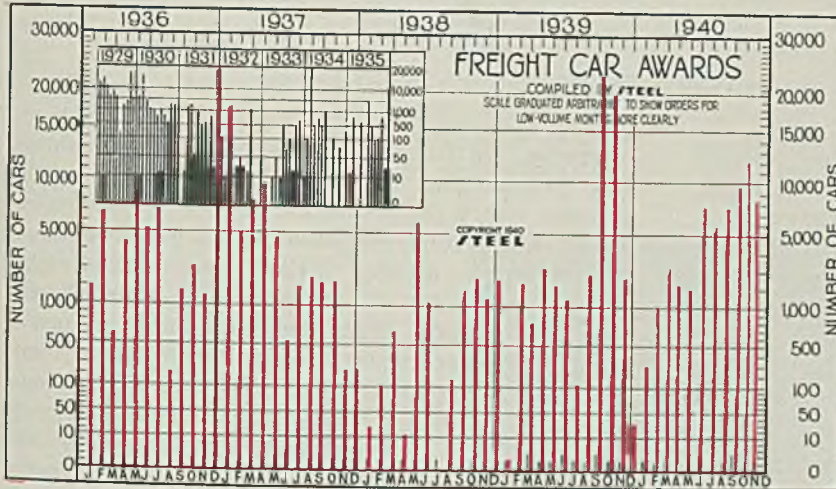
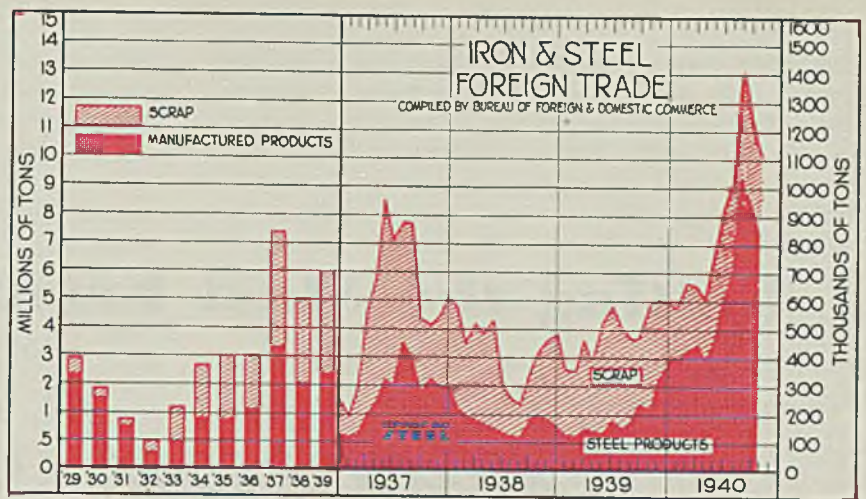
(Million KWH)

Week ended	1940	1939	1938	1937
Aug. 31	2,601	2,357	2,149	2,321
Sept. 7	2,463	2,290	2,048	2,154
Sept. 14	2,639	2,444	2,215	2,281
Sept. 21	2,629	2,449	2,154	2,266
Sept. 28	2,670	2,470	2,139	2,275
Oct. 5	2,641	2,465	2,154	2,280
Oct. 12	2,665	2,495	2,183	2,276
Oct. 19	2,687	2,494	2,214	2,262
Oct. 26	2,711	2,539	2,226	2,255
Nov. 2	2,734	2,537	2,207	2,202
Nov. 9	2,720	2,514	2,209	2,176
Nov. 16	2,752	2,514	2,270	2,224
Nov. 23	2,695	2,482	2,184	2,065
Nov. 30	2,796	2,539	2,285	2,153
Dec. 7	2,838	2,586	2,319	2,196

Iron and Steel Exports

(Thousands of Gross Tons)

	Steel Products		Scrap		Total
	1940	1939	1940	1939	
Jan...	396.1	134.8	187.5	227.9	583.5
Feb...	436.6	134.8	234.7	224.9	671.3
Mar...	457.1	162.1	206.9	312.3	664.0
Apr...	391.8	153.9	221.2	240.1	612.9
May...	471.5	147.8	312.5	384.9	784.0
June...	617.7	190.0	318.4	398.9	936.0
July...	707.8	163.6	327.1	350.1	1034.9
Aug...	1046.1	185.2	346.1	291.9	1402.1
Sept...	965.4	244.9	251.1	330.7	1221.1
Oct...	846.6	255.1	258.5	336.8	1105.5
Nov...	.....	332.9	.....	272.7	.....
Dec...	.....	394.0	.....	206.4	.....
Total	.....	2,499.0	.....	3,577.4	.....



Freight Car Awards

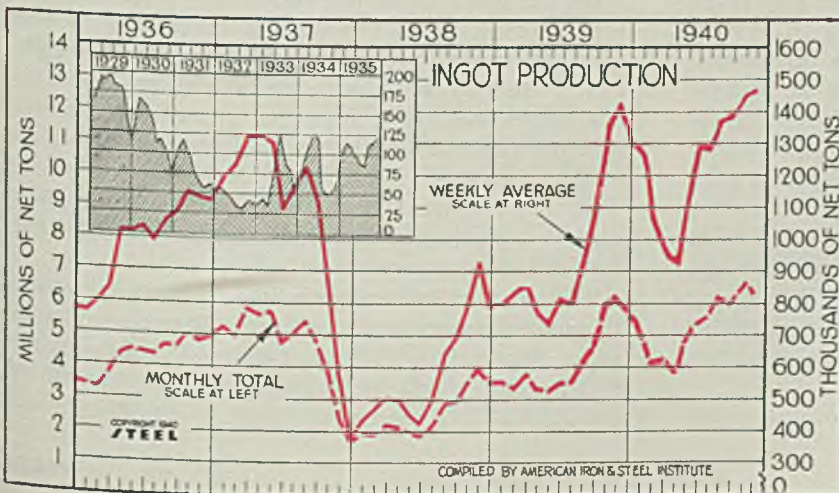
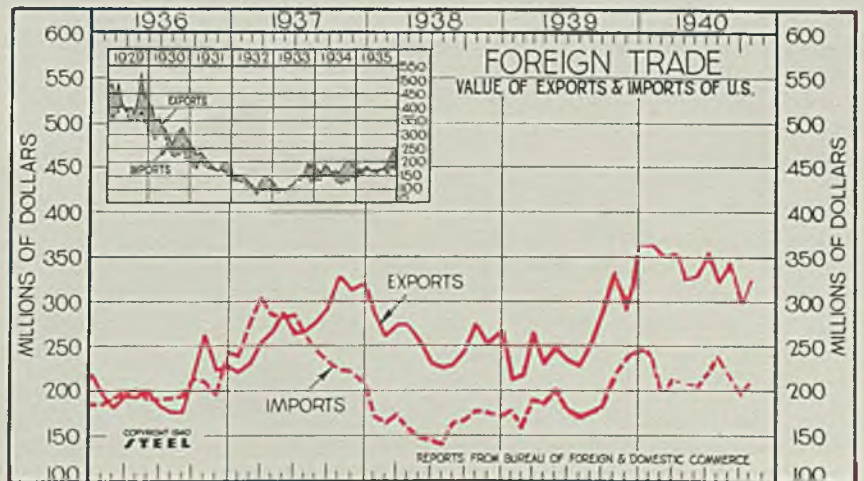
(Hundreds of Cars)

	1940	1939	1938	1937
Jan.....	3.60	.03	.25	178.06
Feb.....	11.47	22.59	1.09	49.72
Mar.....	31.04	8.00	6.80	81.55
Apr.....	20.77	30.95	.15	97.72
May.....	20.10	20.51	60.14	47.32
June.....	74.75	13.24	11.78	5.48
July.....	58.46	1.10	.00	10.30
Aug.....	75.25	28.14	1.82	14.75
Sept.....	97.35	230.00	17.50	12.16
Oct.....	121.95	196.34	25.37	13.55
Nov.....	82.34	26.50	12.32	2.75
Dec.....	.....	.35	25.81	2.75
Total	.....	577.75	163.03	516.11

United States Foreign Trade

(Unit: \$1,000,000)

	Exports		Imports	
	1940	1939	1940	1939
Jan....	\$368.6	\$212.9	\$241.9	\$178.2
Feb....	347.0	218.6	199.8	158.0
Mar....	352.3	267.8	216.7	190.5
Apr....	324.0	231.0	212.2	186.3
May....	325.3	249.5	211.4	202.5
June....	350.2	236.1	211.4	178.9
July....	317.0	229.6	232.3	168.9
Aug....	349.9	250.8	220.5	175.8
Sept....	295.2	289.0	194.9	181.5
Oct....	343.5	332.1	207.1	215.3
Nov....	.....	292.7	.....	235.4
Dec....	.....	367.8	.....	247.0
Total	.....	\$3,177.0	.....	\$2,318.3



Steel Ingot Production

(Unit 100 Net Tons)

	Monthly Total		Weekly Average	
	1940	1939	1940	1939
Jan.	5,655.3	3,578.9	1,276.6	807.9
Feb.	4,409.0	3,368.9	1,065.0	842.2
Mar.	4,264.8	3,839.1	962.7	866.6
Apr.	3,974.7	3,352.8	926.5	781.5
May	4,841.4	3,295.2	1,092.9	743.8
June	5,532.9	3,523.9	1,289.7	821.4
July	5,595.1	3,564.8	1,265.9	806.5
Aug.	6,033.0	4,242.0	1,361.9	957.6
Sept.	5,895.2	4,769.5	1,377.4	1,114.4
Oct.	6,461.9	6,080.2	1,458.7	1,372.5
Nov.	6,282.8	6,147.8	1,464.5	1,433.0
Dec.	.....	5,822.0	.....	1,317.2
Total	.....	51,585.0	.....	989.4†

†Weekly average.

Getting the Most From

Cylindrical Grinders

By FRED B. JACOBS

■ IN ANY cylindrical grinding operation wherein predetermined limits of accuracy must be maintained, quantity output is the aim of every production manager. While the chief factors relating to grinding production are well known to every abrasive engineer, production manager, department foreman and grinding machine operator, visits to a large number of plants where cylindrical grinding is involved in the production schedules reveal that wide differences

When long production runs are involved, multiple-wheel grinding to finish two or more diameters simultaneously permits a large volume of work to be handled quickly, says Mr. Jacobs. He shows, also, how older-type grinders can operate at high efficiency if overhauled properly

of opinion exist as to what constitutes efficiency. The object of this article is to outline briefly the pertinent factors pertaining to quantity production of cylindrical work on center-type machines. These articles are based on data obtained in over 50 representative manufacturing plants and so reflect modern, efficient practice.

It was the custom up to a few years ago to group all grinding machines in one department, this department being supervised by the grinding room foreman. With the advent of the automobile business on a large scale, the so-called straight-line production system was inaugurated. Under that system a representative production line for the manufacture of pistons, for example, would contain all the equipment necessary for machining these parts from the point where the rough stock was received in the department until the finished pistons were ready for inspection. The machines are grouped in the line in the order in which they are needed as the work goes through. In a production line of this kind, there will be found grinding machines for finishing the outer diameter of pistons, machines for grinding the heads, machines for finishing the piston-pin holes, etc.

It goes without saying that each system has its ad-

vantages. In considering the departmental system, bear in mind that it is productive of efficient results in cases where the production is not heavy. For example in a machine-tool manufacturing plant it would be foolhardy to attempt to have out-and-out straight-line production because machine tools ordinarily are not made in large quantities. Therefore in such a plant the departmental system should prove more efficient. If the straight-line production system were

used, a large number of expensive machine tools would be idle part of the time, thus earning inadequate returns on their investment.

There are a great many efficient manufacturing plants which are housed in older-type buildings.

—The Editors

Such a factory, however, is apt to be three or four stories high. Obviously it is a difficult proposition to install straight-line production in a factory of this kind, hence the departmental system must be followed. If, however, such a plant continues to expand, the time may come when its officials will decide to build a modern factory which very likely will be a one-story building. In such event and if the required output warrants it, the straight-line production system certainly should be given careful consideration.

On the other hand, in cases where huge quantities are required, as in the case of automobiles, iceless refrigerators, electric household goods, etc., straight-line production is the only logical answer. However, the entire subject should be given much careful thought and planning before any drastic changes are made. In other words, the plant engineer should work out the whole thing on paper on the basis of definite information on production requirements before installing expensive equipment.

The term cylindrical grinding covers a wide field. It includes everything from tiny rollers for miniature roller bearings up to huge paper-mill rolls. In this article, only small and medium-sized work will be considered. To be sure, there is a difference of

opinion as to what constitutes medium-sized work. Ordinarily, however, it can be considered as any piece that the operator can pick up and handle conveniently either through manual effort alone or with the aid of a chain hoist and rope sling.

While there are many kinds of cylindrical grinders, there actually are only two major types as far as basic design is concerned. One group includes the machines wherein the platen travels back and forth while the wheel head remains stationary as far as longitudinal position is concerned. The other group includes those machines wherein the work remains longitudinally stationary while the wheel head travels back and forth on ways on the bed. There has been much discussion as to which type of machine is the more efficient. Generally speaking, the machine with the traveling wheel head is the more practical for very heavy work inasmuch as the heavy work does not have to be traversed back and forth. However, when it comes to medium work, there is little or no difference between the efficiency of the two types. One can be made just as productive as the other.

In considering any grinding machine, ease of handling should be given attention. The operator has to manipulate the controls hour after hour, hence anything that tends to reduce physical effort in this respect will make for greater efficiency. If the machine is hard to manipulate, the operator's productive speed will be cut down by fatigue during late afternoon. Therefore, ease of operation is of more importance than is generally realized.

It is poor policy to grind small work on a large machine inasmuch as a large machine naturally is harder to operate than a smaller one. Thus, it hardly would be considered good practice under ordinary conditions to grind pieces of say 1 inch in diameter and 12 inches long in a machine capable of accommodating work 14 inches in diameter and 48 inches long. However, production requirements always must be considered in selecting the proper size of machine. If the departmental system is used and only a few cylindrical grinding machines are installed, it follows that at least some of these machines must be equipped to take care of the largest pieces of work that go through the department.

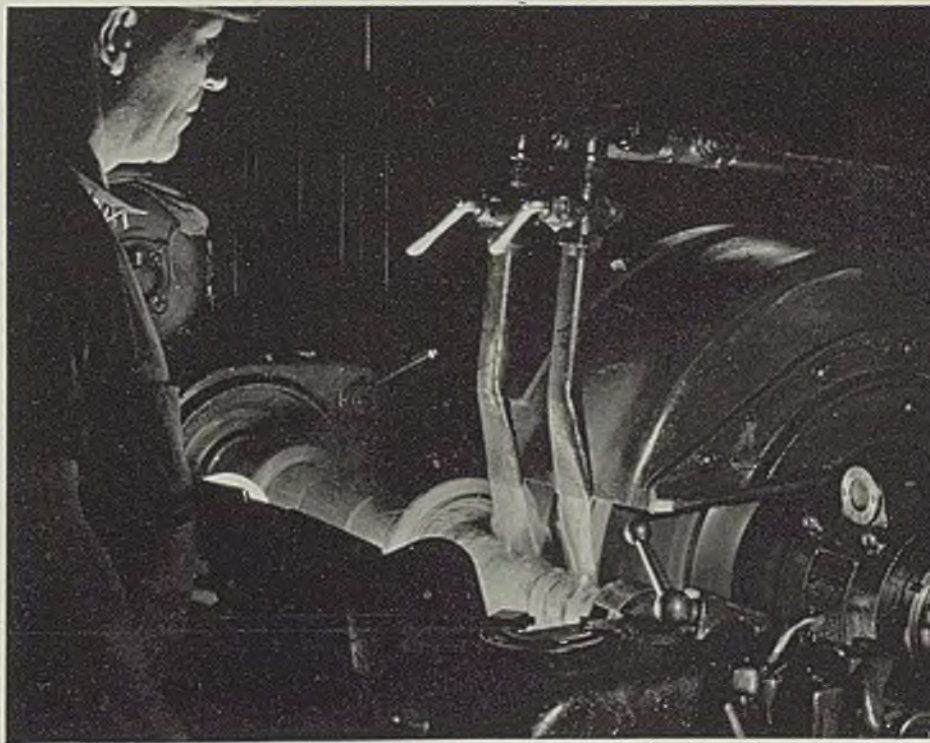
There is too much inclination to look upon the universal type of cylindrical grinder as a toolroom machine only inasmuch as this type originally was designed for tool grinding about 65 years ago. While it is true that the universal machine does fill a distinct place in the equipment of the modern toolroom,

the more recent designs, which are very rigid, are extremely useful on production work as well. There are many production grinding operations which could not be done economically on any other type unit.

In cases where one machine must be relied upon to handle a diversity of work, this type of unit is especially valuable. For instance, in a grinding department where there is a certain amount of face grinding, internal grinding, etc., but not enough to warrant the installation of special machines for this purpose, the universal grinder solves the problem.

However, where any amount of internal or face grinding is to be done, it is better to perform these operations on machines especially designed for the purpose. A modern internal grinding machine naturally is more rigid than the average universal grinder when set up for that purpose, and a modern face-grinding machine such as equipped with a rotary magnetic chuck is easier to load and unload than a universal grinder rigged up for that kind of work.

Multiple wheel grinding was introduced a number of years ago and is productive of excellent results



Here is example of multiple-wheel grinding to finish two surfaces simultaneously. On high production work such as automobile crankshafts, three or more surfaces may be worked at one time

where long production runs are the rule. An excellent example of effective multiple wheel grinding is that of the finishing of automobile steering knuckles, the two diameters being finished simultaneously. Such a dual operation can be performed in the time taken to grind one surface with a single wheel setup. Any method whereby production can be increased at least 100 per cent is to be recommended. Grinding steering knuckles by the multiple method passed beyond the experimental stage many years ago and today is ac-

(Please turn to Page 73)

"Putting the Bee" on Crane

Although there are many electrical hazards present in the operation of overhead traveling cranes, the author emphasizes that the greatest hazard lies in boarding and leaving cranes. His chief suggestion for eliminating accidents is to keep unauthorized persons away from the cranes entirely. In discussing other prevailing hazards, he gives constructive pointers on how to overcome them, and what procedures the craneman should follow in each case

EXPERIENCE indicates that the greatest hazard of the modern overhead traveling crane is boarding and leaving it. Inasmuch as cranes are not passenger transporting vehicles, persons not authorized, or those whose duties do not require their presence on them, should keep off.

One of the first things an authorized person should bear in mind in boarding a crane is to attract the craneman's attention. When the operator has been notified, the authorized person should proceed to the landing platform and wait. Incidentally, landing platforms should be located so a man may stand on them without fear of being injured. Upon arrival of the crane, the operator should push his protective panel "stop" button, pull his main cab knife switch and come out of the cab so the man desiring to get on can see him. Meanwhile, he also should watch for other approaching cranes. This same procedure applies on leaving. Once the man is aboard, the craneman should keep his charge in sight at all times.

In case the crane should have a breakdown in the middle of the runway, and no other cranes are around, then it is necessary to give a repairman permission to traverse the runway—providing it is walkable. Of course, if another crane is available, the repairman should utilize it. In this case as the craneman maneuvers his crane alongside the disabled one,

and is ready to permit the transfer, the same procedure outlined above for boarding and leaving the crane should be followed.

These motions often are difficult to enforce. It is necessary, however, that they be followed in order that the men get into the habit. Once this habit is formed a serious potential hazard which may cause a fatality is eliminated.

Another existing hazard is the proper connection of lifting magnets on overhead cranes. Ordinarily the magnet should have its own fused safety switch inside

the cab which the operator can pull out readily when the magnet is being connected, disconnected or the magnet cable is being repaired. The present practice is to provide a main cab knife switch in each cab and a "stop" and "start" pushbutton for the crane protective panel. Sometimes, if not too large, the crane protective panel itself is included. The tendency, recently, has been to eliminate these features, but those who favor this step have been unable to answer such questions as:

- (1) What would you do if a controller jams?
- (2) What would you do in case of grounds, shorts or other failures which allow the motor to run after the controller has been centered?
- (3) What would you do when making a combined trolley and hoist motion when a single unit "kicks" out of overload?

Although other similar problems prevail, these alone are enough to warrant keeping the main cab switch, as well as the protective panel in the cab.

The reader may wonder just where is the best place to connect the magnet. If installed in the circuit after the protective panel, every time the protective panel opens—the load is dropped. Therefore, it should be placed ahead of the protective panel—just after the main cab switch. This allows the retention of the load when the protective panel operates, insuring the magnet from being disconnected from the line when the craneman leaves the

Hazards

crane. If installed ahead of the main cab switch, as some would have it, then there is the problem of not being certain that the magnet is disconnected.

Speaking of switches, both heater and light switches long have been a bone of contention. The present practice in regard to these is to connect them ahead of the main cab switch, removing all combustible material from the crane cab.

Another safe practice is to provide a main switch right off the connections from the collector rails which will disconnect everything on the crane. In this connection it is appropriate to mention that all men should be instructed never to go on the top of any crane without first locking out this main disconnect switch.

The removal of combustible material from the crane cab requires constant effort on both the production and maintenance departments. Bridge walkways also must be kept clean and free from grease and oils.

Another hazard is escape ropes. They might be necessary in some locations. If possible, these locations should be altered so escape ropes are no longer necessary.

Going back to the proper method for protecting a crane undergoing major repairs where there is more than one crane on the runway—there is only one safe method. In addition to warning the crane operator, bumpers should be placed on each side of the crane on each rail. Signs also should be placed in each adjacent crane cab reading, "Bumpers on Track" and "Danger, Men Working Above."

This method works very well if there is not more than a single shift involved. If the job requires more time than the usual shift someone should see to it that all cranemen coming on duty are personally instructed that bumpers have been placed on the track. Some engineers insist on mounting a red light on the bumpers. Experience, however, indicates that this will not replace the notification method.

When not in use, bumpers should be stored in a box at the top of every runway staircase. They should be taken out of the box on the way to the job and replaced after the job is completed.

Although some prefer the use of torpedoes ahead of bumpers, others believe that when they go off they shock a man and may cause him to lose his balance—that after going off they are not replaced. To be effective, bumper settings must be closer or torpedo settings wider. This may sometimes require too much space.

Building Clearance: New buildings should be constructed so a man can ride the bridge with room to spare. On certain cranes, pit cranes for example, he should be able to ride the trolley without danger of injury. Places to watch clearance are the gusset plates and on the sides of the roof truss. On new buildings designers should make certain that crane height is such that the hoist limit switch need not be locked in order to service any unit in the building. Wherever possible clearance should be provided between the building columns and the crane trucks. Care also should be taken, where the trolley comes alongside the cab, that there are not collector staffs hanging down, or that the cables do not come so close to the cab that they endanger the craneman.

One praiseworthy development is the practice of slanting the front of the cab and installing full length glass. This gives better visibility and keeps the craneman inside the cab. Standardizing controller positions also has been a big factor in eliminating accidents.

A definite hazard to electrical men is servicing the main collector shoes. When cranes were first built the collector shoes might have been installed above the crane where it was necessary to run the trolley in and stand on it to service them, or the shoes might have been below the crane where a man had to

New buildings should be constructed so a man may ride the bridge with room to spare. It also is necessary that plenty of room be allowed for all types of servicing. A praiseworthy development is the incorporation of a slanting full-length glass front on modern cabs. This provides better visibility and keeps the operator inside away from danger

hang like a monkey to get at them. Present-day construction places the collector shoes in locations where they are below the crane trap doors that are placed in the bridge walkway through which a man can drop to a caged platform.

When the crane is outside and its "hot" rails are subjected to ice, two sets of collector shoes should be provided. This prevents accidents due to loss of power.

Trouble shooting on cranes always will be a hazard. This is being overcome by teaching men to

recognize faults when the equipment is down, using the trial method only as a last resort.

Centering devices on controllers are installed for the benefit of operating men. Years ago an electrical man regarded the centering devices as his protection, and as fast as they were installed the operating man would make them inoperative. But when the electrician took the attitude that the centering device was installed for the benefit of the operator and left them inoperative if the craneman objected, the objections ceased. Thus, if at any time a cen-

Normally, travel brakes are not needed as most crane-men stop their cranes by plugging the motor. There is always the chance, however, of a sudden emergency which makes the installation of this unit necessary. A slip gear should be utilized on stiff leg cranes so their trolleys cannot lift off the runway

tering device is taken off any unit the operating should be held responsible—not the electrical man.

When a good substantial crane safety limit stop was developed the steel mill electrician was happy. However, it boomeranged like everything else that promises too much. The crane men began overworking these stops, using them as a normal stop on short clearance hoists. It must be expected that even with the best of care there will be failures every now and then.

Hence, failures will surely occur when the chance is multiplied by increasing operation from approximately six times a day to 240 times a day. The occasional failure of the safety limit stop leads some to the belief that it should be eliminated and that the crane man should be held responsible for running blocks. The best course is to continue its use and to train operators not to use it as a stop for every lift.

A hazard that is present not only on cranes but all electrical apparatus is that of flashes which cause eye injuries and burns. On some automatic controls the moving armature sometimes jams on the arc shield. The electrician, in making repairs, raises the arc shields and stands in front of the board to test the contactors. This is a dangerous practice and should not be tolerated.

Some maintenance men recondition the commutators of their motors while on the crane. This also is an unnecessary hazard. Commutators that need conditioning should be sent to the shop.

Another common electrical hazard is *exposed* controllers in crane cabs. All master controllers should be completely covered. All manual controllers also should be covered, or be located so that when the crane man leans against them he cannot touch any live parts.

On modern cranes all electrical controls should be placed in dustproof cabinets located so the electrician can watch their operation without placing

himself in a hazardous location or interfering with the crane man's duties.

A hot weather crane hazard is buckling of the main runway collector rails. Buckling is not caused directly from heat but appears after rail creepage has moved all the rails against each other in one location. The best way to eliminate this is to anchor the rail at predetermined places on the runway. Provisions also should be made to prevent the rail from leaving the supporting brackets.

A separate switch located conveniently on the floor for feeding each runway should be installed. Also, if the runway is long it should be sectionalized so a section can be de-energized.

If the main runway feed consists of a trolley wire instead of rails, the floor switch should be of the fused type. The trolley wire should be moved back and forth frequently to prevent it from wearing through where it rests on the support spools.

Brakes: In some places crane brakes are repaired by mechanical men, in others by electrical men—still others by crane repairmen. All repairmen should be cautioned frequently not to attempt to make brake adjustments with a suspended load. They also should be cautioned not to release the brake preparatory to changing the hoist motor without properly blocking the gearing.

The Travel Brake: Most crane men stop their cranes by plugging the motor. Thus for normal purposes a travel brake would be unnecessary. However, there is always the sudden emergency that makes a brake necessary. The hydraulic brake fits the problem best for stationary cab cranes. Instead of plugging, the operator should be encouraged to use the brake.

The traveling cab crane presents another problem which is best answered by dynamic braking. This can be supplied for power failure only. It also can be controlled through the master controller and used for every stop, or it can be controlled by means of a separate foot control. It will not stop the crane completely, but it will reduce its speed considerably.

Stiff leg cranes, such as pit cranes and strippers, are always provided with a slip gear so their trolleys cannot lift off the runway. Even with this feature, however, the trolley is subjected to a shock which may knock the trolley slides off the collector bars. This can be eliminated by the use of trolley wires.

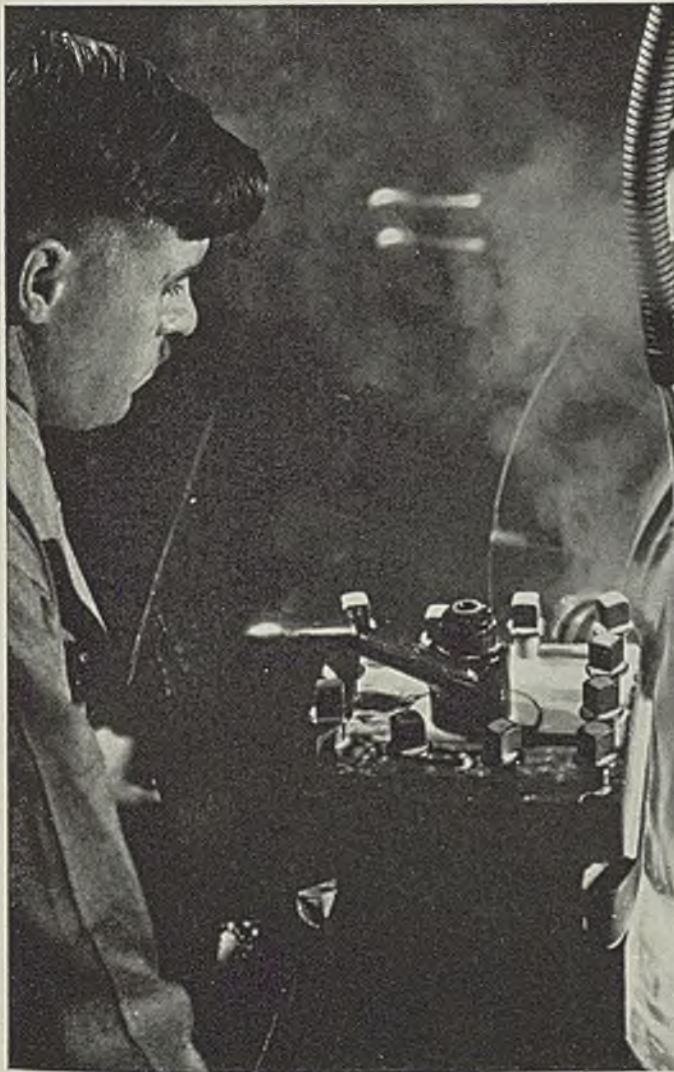
In this event the wiring should be in rigid conduit. Where wiring runways are used care should be taken where the wire enters the runway to avoid grounding. Where wires leave the back of the control board, they should be mounted on insulated brackets. Codes should be rigidly followed. If the main feed on the crane is so small that the power house circuit breaker does not protect it against fusing, then the main crane switch should be fused.

Overload circuit breakers should be set high

(Please turn to Page 73)

Look to your tools for

Extra PLANT CAPACITY

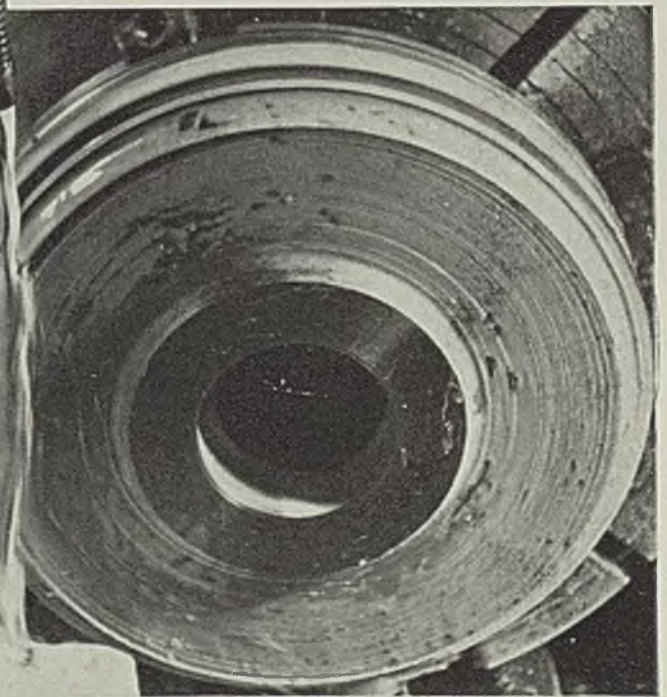


IF production is crowding you to the point where backlogs are building up, and deliveries are bogging down—check the actual output of your machines and presses against their rated capacity. Most shops find this actual output figure is far below rated capacity.

The reason can frequently be traced to too many production interruptions caused by tools falling short of their job. Here, then, is your opportunity for getting extra capacity in a hurry. Improved tool performance, made possible by Carpenter Matched Tool Steels, keeps machines and presses operating steadily—boosts output substantially.

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Fig. 1—An ordinary welding helmet protects the gouger from the hot gases and slag. Note the hand torch being used. Photos courtesy The Linde Air Products Co., New York

Flame Gouging Welds

Flame gouging is recommended as a substitute for chipping. The process is learned easily and inherently assures good results as a defect is readily visible in molten slag, even by a novice

By HAROLD LAWRENCE
Welding Engineer

■ OFTEN a considerable period passes before steel fabricators accept an idea as revolutionary as flame gouging. To clear up some points from the operating angle is the purpose of this article. This process has had some startling claims made by those who developed it. The experience of many months following the manufacturer's instructions has borne out all the claims.

Wherever pneumatic chipping is used to produce sound welds, there is an opportunity to save money by flame gouging. That does not mean that all pneumatic equipment is headed for the junk pile. Instead the use of pneumatic tools for peening and grinding, and flame gouging in place of chipping is the plan. No progressive shop can afford to be without both.

Flame gouging is utilized in removal of the land zone, smooth removal of fitup lugs, elimination of weld defects and elimination of tack welds—all accomplished with speed and economy. Despite the large quantities of gas required by the process, and everyone concerned realizes that these quantities are large, the overall cost of the process is less than that of chipping.

No extensive amount of equip-

ment is demanded to accomplish these results. An ordinary medium oxyacetylene torch of either the right-angle head type or a straight torch together with the gouging tips completes the set. Gouging may be accomplished by hand or by some machine setup. The type of work being done will decide this.

Flame gouging may be done by hand with machine-like precision or to give a ragged and generally unsatisfactory cut. The difference lies in the operator and his aptitude.

If the operator is trained properly, he is likely to take pride in his accomplishments. Such a man will become an expert in flame gouging within a few days. A young operator will be more likely to become proficient than an older man. Nor is it necessary to use a trained cutter for flame gouging. In more than one observed case a man with no previous experience in oxyacetylene cutting has done creditable work in a short time. In at least one instance an old hand at cutting would have nothing to do with the new process even though he appeared to be trying to learn. A shop less willing to experiment

might thus have been denied the benefits of this method.

A large amount of heat is generated by flame gouging. Some ingenuity is demanded of the operator to enable him to be comfortable while manipulating the torch. Here, as in all other manufacturing efforts, comfort of the operator results in increased output. As in Fig. 1, the operator may use an ordinary welding helmet equipped with a light colored lens or filter suitable for oxyacetylene cutting. To protect their hands some men have devised light sheet metal hand shields somewhat similar to those used with carbon arc electrodes. In any event, some attention to heat protection is warranted.

Two main difficulties must be overcome before the novice operator gains the necessary confidence in his work. One is the tendency to lose his cut and the other is possibility of burning a hole completely through a thin seam.

The ability to sustain a cut comes from practice. Every effort must be made to encourage the gouger to make as long a cut as possible without stopping. In the beginning a slight oscillatory motion will prove to be most helpful. Later as the operator gains both confidence and increased ability, the



ALTER EGO: Literally "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

ALTER EGO: How many have offered you a "good-as-Fleetweld" rod . . . and are they confessing or bragging?

Well, here's the third different welding rod proposition that lays eloquent emphasis on the claim that it's as good as "Fleetweld." That's stimulating.

ALTER EGO: No, it's emulating. Emulation admires and strives to imitate great actions. It's a human trait.

That prompts me to ask myself—"Why is 'Fleetweld' taken as the standard of welding electrode comparison?"

ALTER EGO: Maybe Lincoln can give us the **FACTS** and we can judge for ourselves.

• •

LINCOLN SUGGESTS: To find out why "Fleetweld" is the standard of comparison for welding quality and economy, **TRY IT!** Compare it to other electrodes. In what ways? See the 30-Point Check Chart on Page 5 of the New "Weldirectory." This 56-page procedure guide (gratis) gives all the **FACTS** about 37 Lincoln Electrodes for welding and hard-surfacing—where to use them—how to use them—what weld properties to expect.

LINCOLN "SHIELD-ARC" WELDING

THE LINCOLN ELECTRIC COMPANY
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oscillations may be discontinued, but the perfection of such a maneuver will not be wasted. Sometimes a backward motion of the torch is desired in the removal of an exceptionally deep defect.

Regarding the possibility of burning a hole in a thin section, practice again appears to be the best answer. At first the gouger may experience some trouble in maintaining a constant depth of groove. With practice, however, a groove of exact depth and uniform width will be as easy to make as a uniform weld.

Another contributing factor to burning a hole through the seam is the welding itself. A change in welding procedure may be in order to make possible the removal of less metal during the gouging. Unfortunately the chipping chisel has a tendency to smear over small cracks and defects. Not so the gouging torch. The heat of the gouging operation and the nature of the molten slag reveal the slightest imperfection with remarkable clarity.

No doubt this fact easily explains the ready approval of flame goug-

ing by ultra-conservative inspection agencies.

Flame gouging results in a large amount of slag which runs ahead of the cut to exert a mild preheating action on the metal to be cut. Encourage the gouger to disregard this slag as an astonishing amount of it may be encountered without impeding the operation.

That there is no limit to the thickness of steel that may be gouged is quite apparent. There may be some question about the thinnest material that lends itself to gouging. However, $\frac{1}{4}$ -inch plate is gouged without any trouble whatsoever and $\frac{3}{16}$ -inch plate offers no problem to a proficient gouger. Only more concentration is needed to avoid too deep a cut.

Machine cutting may be employed to speed the operation but mechanical operation is not needed to guarantee precise cuts. A fine appearing cut as that in Fig. 3 does not mean that a machine arrangement was employed as in Fig. 2. The cut illustrated in Fig. 3 was made by hand after the gouger had been trained for less than 8 hours.

Many shops utilize gapped seams

to enable them to secure good penetration with a minimum of chipping to remove the zone of unsoundness. Before the development of flame gouging, this idea was justified on the basis of lower overall costs. Although the welding operation was considerably slowed by the gap, a material reduction in a slow chipping effort resulted. Now the gap may be closed to permit faster welding without penalizing the gouging in any way.

Fitup accomplished with the aid of fitting lugs involves removal of pieces of steel. Often they are broken loose, leaving an ugly tack weld to show where they had been placed. With the flame gouging torch, an operator may remove these tack welds flush with the plate and expensive grinding is eliminated. The only precaution needed is demanded of the tack welder. This man must not undercut the tack weld. A short arc will help attain this.

Defects "Spotted" Readily

Where radiographic examination of welded seams discloses a defect, the oxyacetylene gouging torch really comes into its own. Two distinct advantages are apparent. Ready recognition of the defect and speedy metal replacement. When pneumatic chipping was used exclusively to prepare defective welds for repair, a doubt existed in the mind of the chipper. He was not always sure he had found the defect. Not so with flame gouging. The defect appears in the molten slag so even a novice can recognize its presence.

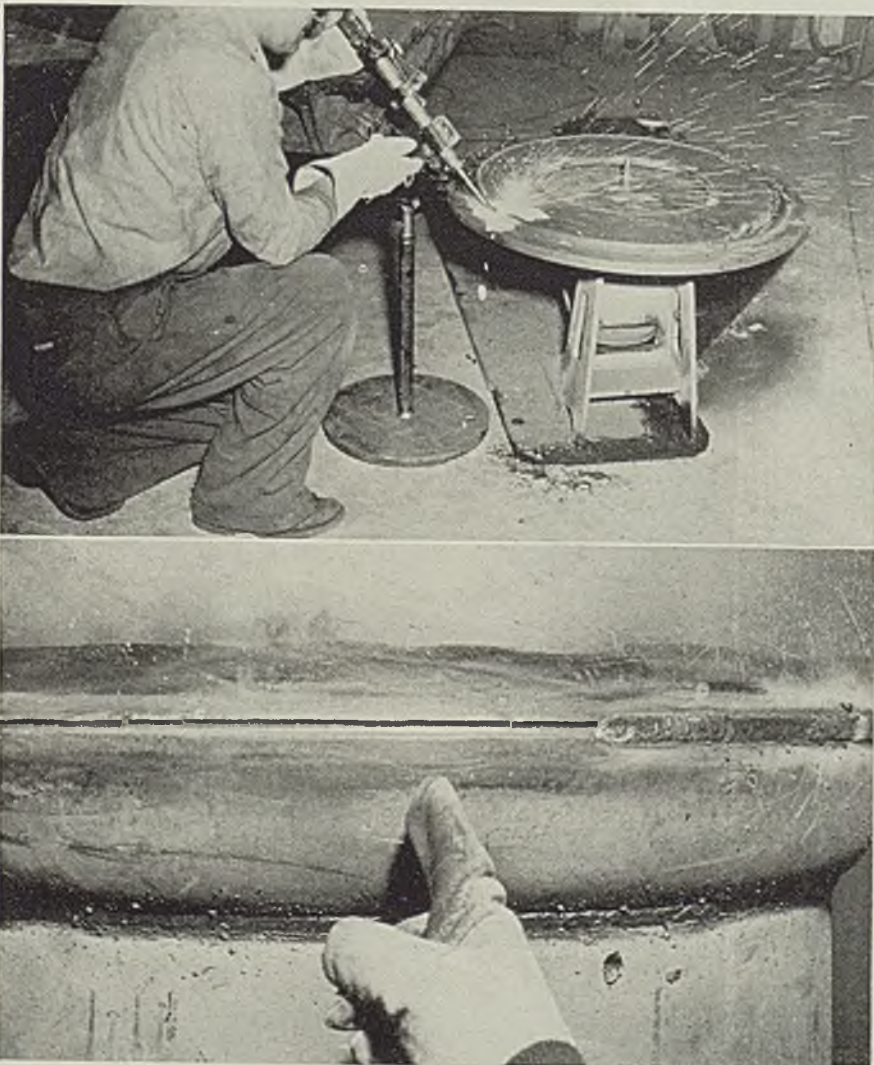
Being able to spot a weld defect reduces the cost of making repairs. Often chipping has been carried out to too great a depth in an effort to make sure that all gas or slag had been removed. Other times the chipper felt he had removed the slag inclusion only to learn on second exographic inspection that part of the defect had been left behind. With flame gouging, the hot slag exposes all of the troublesome inclusions to enable the fabricator to make certain on the first repair.

The speed of most gouging operations is at least three times that of chipping. Groove design enters into the speed problem. Little experience with the process enables anyone to improve the overall welding procedure to incorporate gouging to its best advantage. Perhaps

(Please turn to Page 88)

Fig. 2—A straight torch is employed for mechanical gouging as in this setup shown at left, above

Fig. 3—Machine-like precision such as that shown here is possible even with hand operation of the gouging torch





In an Emergency . . .

WHAT'S AT THE OTHER END OF THE LINE?



In an emergency, do you have confidence in the ability of your source of supply to take care of your needs?

Consider how important it is to know what's at the other end of the line! Is there adequate facility of plants, machinery, raw material and skilled workmen to properly fill your orders? Is quality assured, even in times when production continues through the night? Is service and customer satisfaction such an in-built habit that it can be depended upon?

These are merely a few of the points worth considering in times when industry takes a spurt. They have been a part of R B & W operations over a period of 95 years—through good times and bad, rush periods and slow. For almost a century R B & W bolts, nuts and threaded fastenings have been available always, under all business conditions—in the same outstanding quality, with the same outstanding service.

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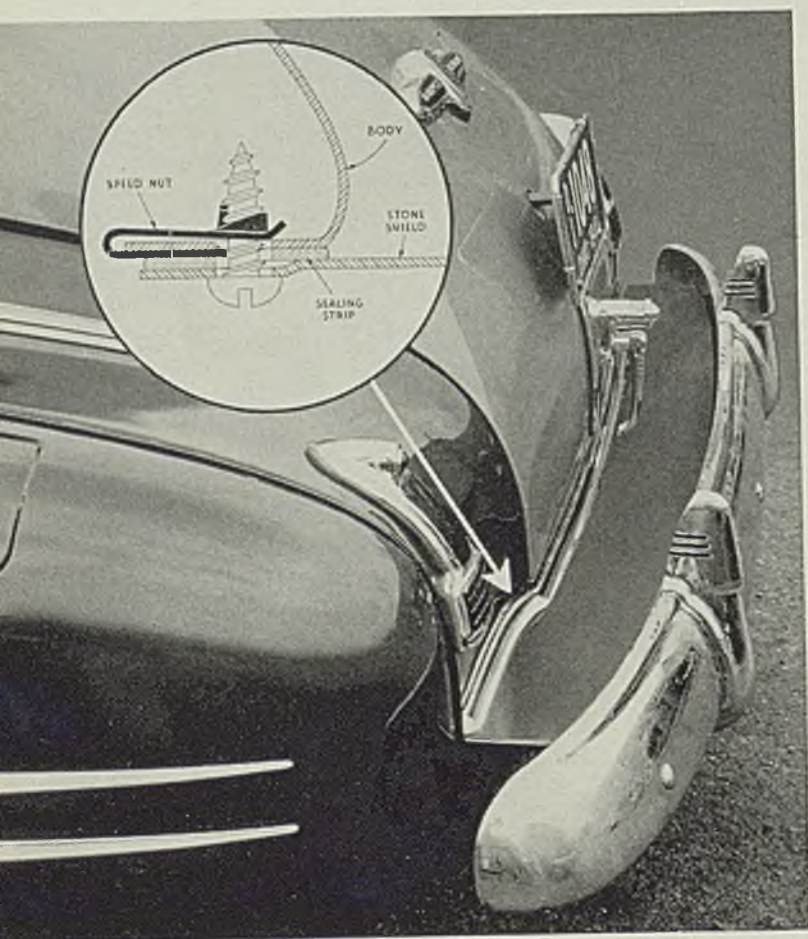


1941 CARS FEATURE

New Ways TO Speed Assemblies

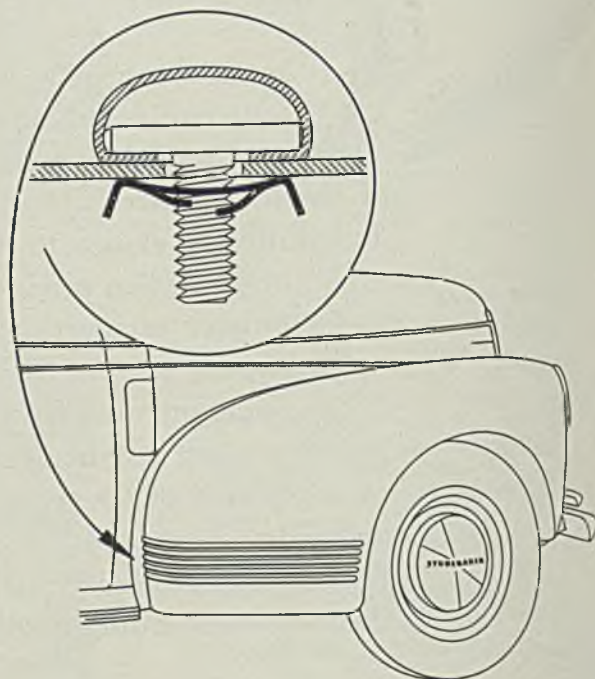
■ THE HISTORY of the Speed nut is one of the outstanding success stories of the decade. It was only a few years ago that a first Speed nut was used on any automobile. Today they run as high as 250 per car with the automobile industry alone using more than a million a day.

The reasons for this amazingly quick acceptance lie in the versatility and economy of the Speed nut system. In any application it replaces at least two parts and frequently as many as five. This means economy both in assembly time and materials. The manufacturer says a conservative estimate shows their use will cut average assembly costs at least 50 per cent. In addition, these units have considerable strength as an ordinary Speed nut weighing less than $\frac{1}{4}$ -ounce and measuring only $\frac{5}{8}$ x $1\frac{1}{8}$ x 0.046-



Here is the Buick stone shield assembly at rear of the car held with a J-shaped Speed nut as shown in the insert. A sealing strip is carried between the body and stone shield. This nut snaps over the flanged edge and has portion on its underside bent out to hold it in the engaging position. Its use eliminates welding cage nuts to underside of the body panel and effectively avoids any loosening from vibration

Shown below is how Studebaker holds molding strips on fenders. Rectangular headed bolts are slid into the hollow interior of the molding from one end to line up with holes punched in the fender. Molding is applied to fender with studs projecting inwardly and then a Speed nut with turned-up ends as shown is zipped over the end of the studs and given a couple of turns with a power tool to form a simple light fastening of considerable strength. The permanent spring action can be relied upon to hold the molding strip tightly against the fender

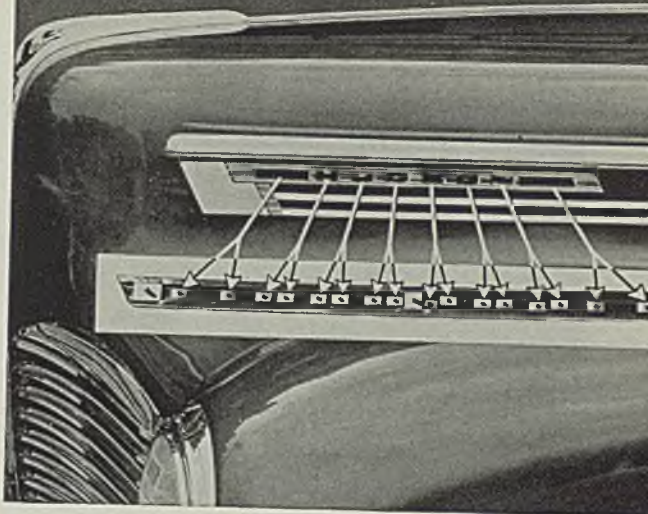


Lower right, opposite page, increased use of parking lights and turn indicators on top of fenders involves the problem of mounting the small bullseye lens used in these assemblies. In the method shown at the right, a special Speed nut has a flat base with prongs formed to fit over an integral stud on the diecast lamp base. The two spring arms of the nut are formed to

inch thick has lifted more than 3000 pounds.

Perhaps versatility is the most outstanding feature of the Speed nut system as more than a dozen different sizes of standard shaped Speed nuts are employed in each car today along with as many as 50 specially shaped Speed nuts. The result is more and more parts are being designed for assembly by this method, and new types of Speed nuts are continually being developed to replace several parts. Accompanying views show a few of the more interesting new applications of this method of assembly found on 1941 cars.

In addition to those shown, other standard automotive uses include fastening insulation to the dash or fire wall, holding on name plates and ornamental parts; for assembling mufflers, head lamps, stone deflectors, radiator cores—and many others.



In 1941 Hudsons, the nameplate design on the outside of the hood is a combination of individual plastic letters which fit into depressed portions of a metal strip. Each letter has integrally formed studs and is applied from the outside of the U-channel metal trim strip. Then rectangular Speed nuts are zipped over the plastic studs on the inside of the strip to hold the individual letters firmly in place with no possibility of loosening from vibration as they exert a deep, biting grip into the plastic studs

New parking light on the 1941 Chevrolet, right, employs an oval-shaped Speed nut that fits contour of inner base of lamp. It not only holds the lamp socket but also affords a watertight seal by drawing the collar of the rubber grommet tight against the outer metal lamp shell as the nut is tightened. Assemblers do not need to hunt to find the threads for when the two screws are inserted in the holes in the lamp shell from the outside, they instantly engage the prongs of the Speed nuts

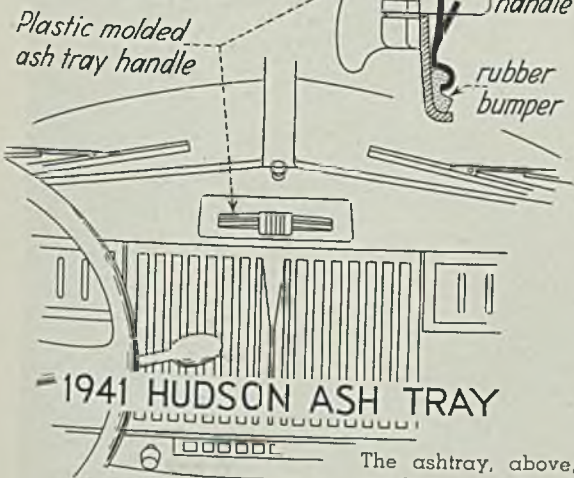
1941 CHEVROLET PARKING LAMP ASSEMBLY

Each of 2 speed nuts holds plastic handle and rubber bumper

Integral stud of plastic handle

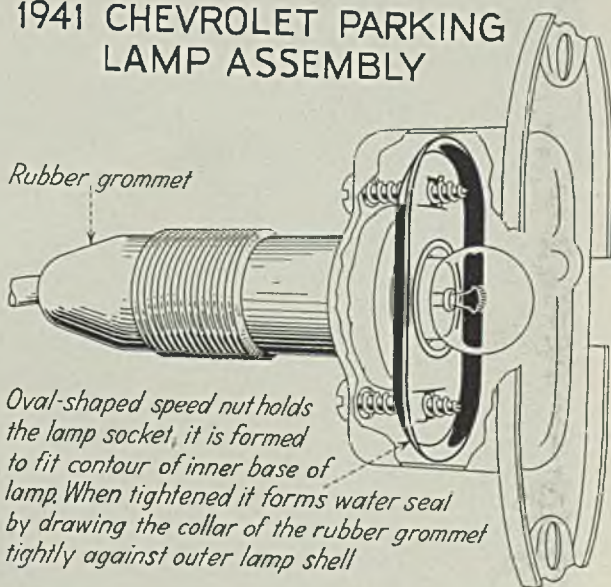
rubber bumper

Plastic molded ash tray handle



Rubber grommet

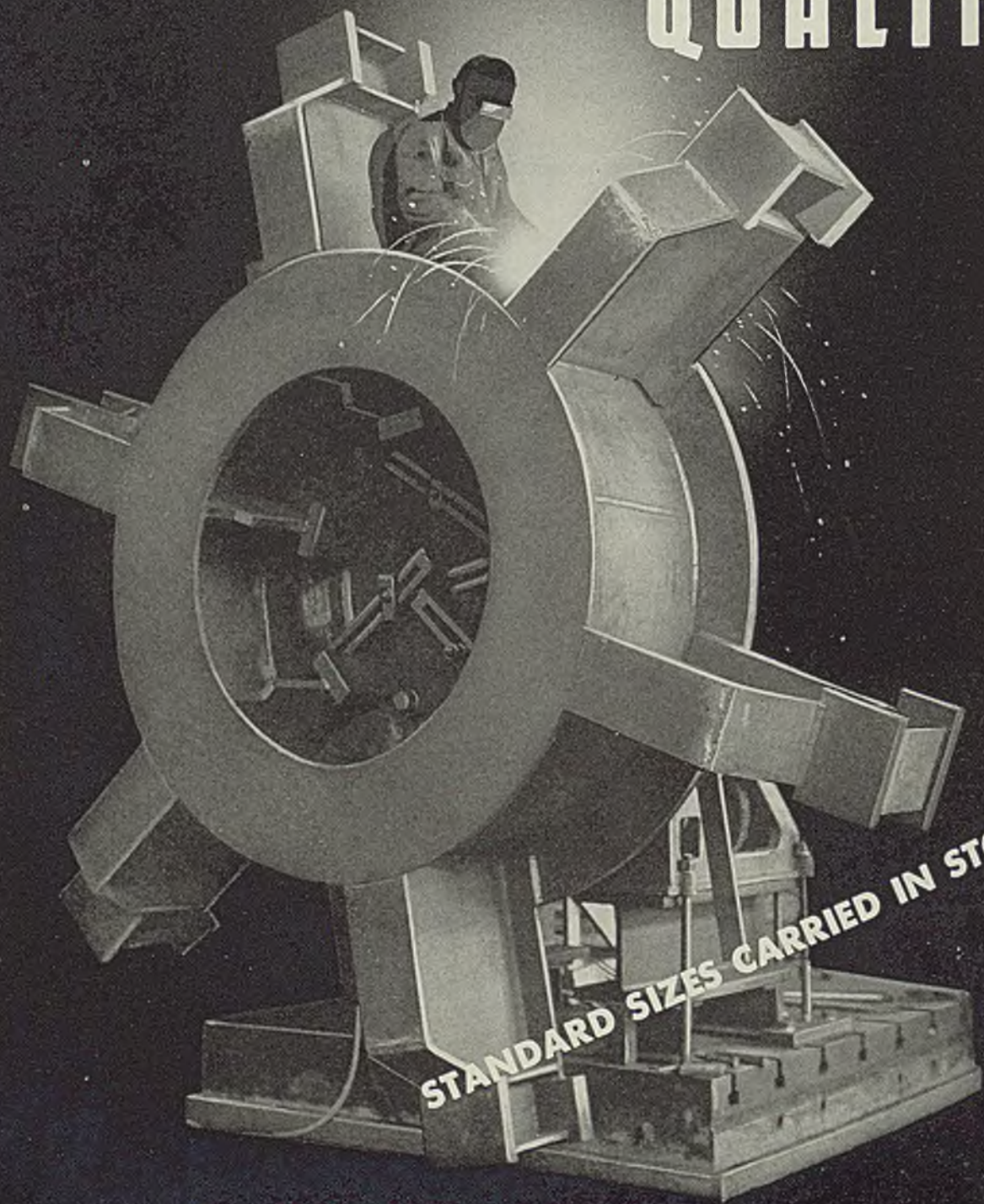
Oval-shaped speed nut holds the lamp socket, it is formed to fit contour of inner base of lamp. When tightened it forms water seal by drawing the collar of the rubber grommet tightly against outer lamp shell



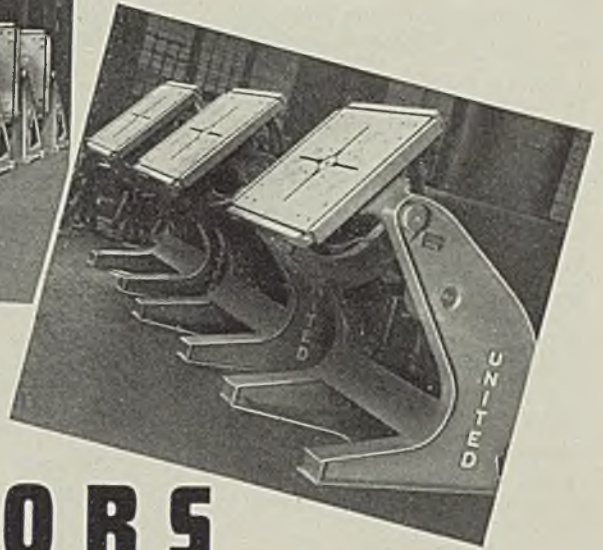
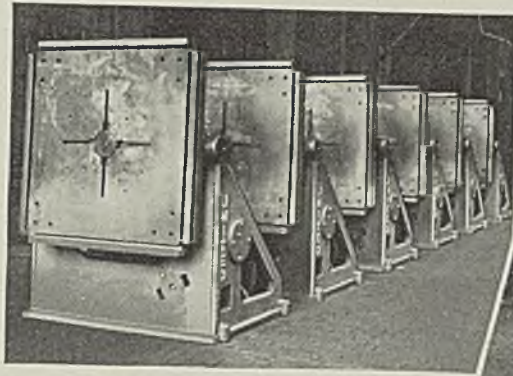
The ashtray, above, in 1941 Hudsons employs a plastic molded handle which is held to the ashtray door by two Speed nuts which engage studs formed integral with the plastic handle as shown in the enlarged cross section. At the same time these nuts hold a rubber bumper in place on the inside of the door to prevent rattles. This is a typical example of how a single Speed nut can not only lock unthreaded studs but also how its one-piece design can be adapted for multiple functions

fit snugly into the groove in the outer periphery of the bullseye lens. To assemble the lens, the Speed nut is first pressed over the diecast stud until it rests firmly against the base. The lens then is inserted by opening the arms and letting them spring back into a groove in the glass. Lens thus is held under spring tension against top of the stud and no amount of vibration can loosen it. This is another example of how a one-piece design performs multiple functions. The variations possible appear to have no limit. Already over a billion Speed nuts have been used and over 700 designs developed

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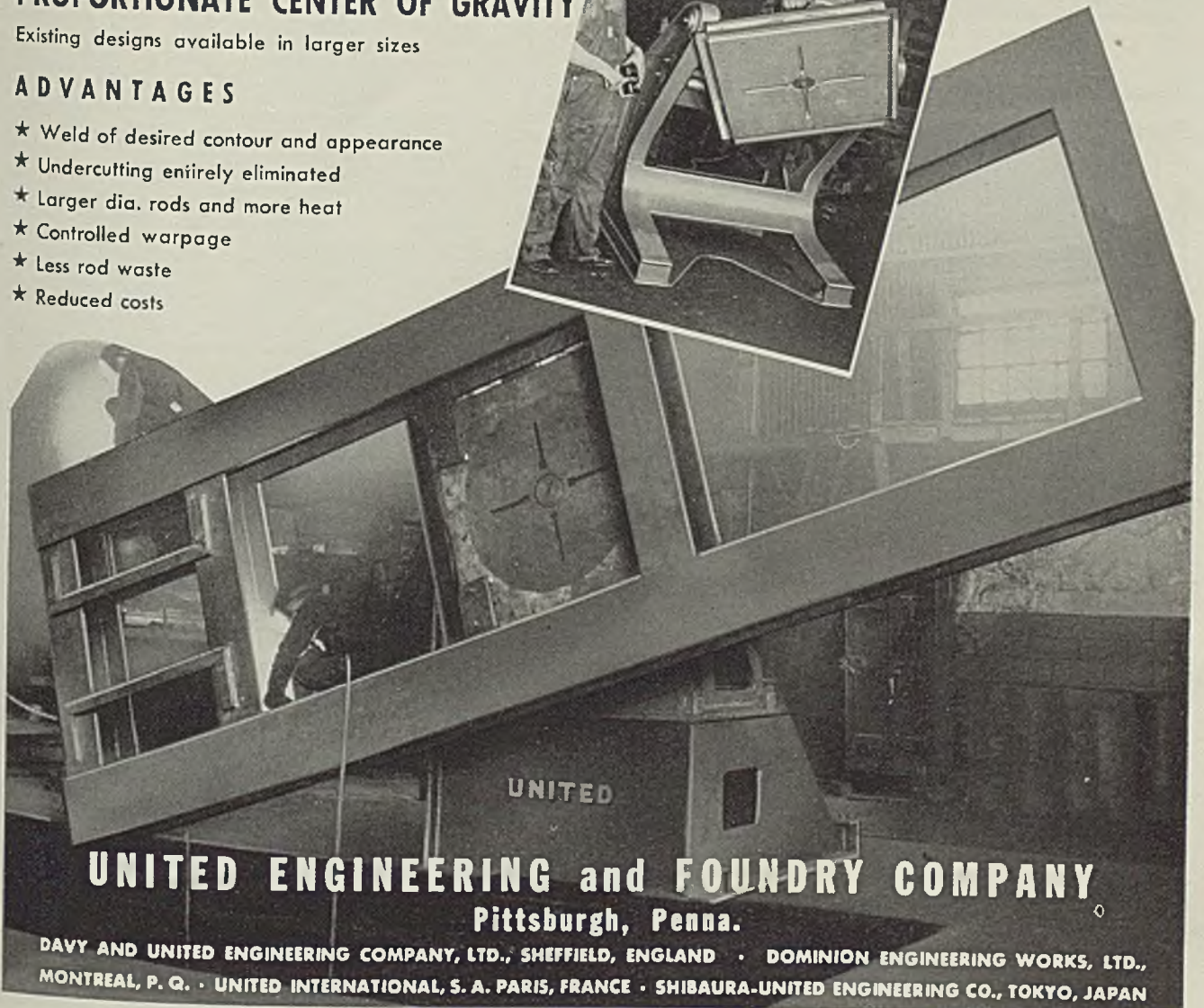
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Defense Awards

(Concluded from Page 41)

Starrett, L. S. Co., Athol, Mass., calipers, gages, dividers, squares, levels and plumbs, \$29,842.33.
Taylor-Wharton Iron & Steel Co., Easton, Pa., shatter-proof gas cylinders, \$92,885.
Thurston Mfg. Co., Providence, R. I., tools, jigs and fixtures, \$6826.80.
Timken Roller Bearing Co., Steel & Tube division, Canton, O., nickel, bar steel, \$38,661.
U. S. Industrial Developments Inc., Detroit, tools, jigs and fixtures, \$9921.21.
Whitcomb Locomotive Co., Rochelle, Ill., locomotives, \$41,342.
Willamette-Hyster Co., Portland, Oreg., lift trucks, \$10,052.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., propulsion motors and spare parts, \$47,114.

Bureau of Yards and Docks Awards

Arctic Engineering Co. Inc., New York, renewal of ammonia receivers for refrigerating equipment at naval hospital, Brooklyn, N. Y., \$633.
Barrett & Hill, San Francisco, assembly shop at navy dry docks, Hunters Point, Calif., \$660,900.
Burrell, J. E., & Sons, Long Beach, Calif., repairs to wharf at target repair base, eleventh naval district, San Diego, Calif., \$27,766.
Ritchie, Walter L., West Somerville, Mass., housing facilities at naval reserve aviation base, Squantum, Mass., on a cost plus fixed fee basis, \$175,000.

Week's Canadian War Awards at New Peak

TORONTO, ONT.

Canadian department of munitions and supply last week reported awards totaling \$78,964,421, a new weekly record. Armament items, awarded by the ordnance division,

totalled \$70,000,000. Orders placed with companies in United States aggregated \$268,535.

Restrictions on imports of luxuries and articles not essential to war were recently imposed by the Dominion government to conserve dollar exchange for purchase of war supplies from United States. Ban was extended to new model automobiles, radios and other household appliances and equipment.

Purchases of steel beyond actual current requirements for other than war materials was forbidden by H. D. Scully, Canadian steel controller. Canadian mills' backlogs have increased steadily, and on many items extend into second quarter, 1941.

Imports from United States are still mounting. Total imports from the states in October was \$76,700,000, more than \$13,000,000 above September's total. Bulk was for airplanes, steel, automobiles and parts, machinery and similar products.

Contracts placed last week include:

Instruments: Air Ministry, England, \$9963; Canadian Marconi Co., Montreal, Que., \$9836; Halliburton & White Ltd., Montreal, \$13,461; Ontario Highest-Owens Co. Ltd., Ottawa, Ont., \$53,905.

Electrical equipment: British Admiralty, England, \$73,173; Canadian Marconi Co., Montreal, \$35,630; R. C. A. Victor Co. Ltd., Montreal, \$17,235; Northern Electric Co. Ltd., Ottawa, \$27,880; Faranti Electric Ltd., Toronto, Ont., \$9550.

Machinery and tools: T. E. Ryder Machinery Co., Montreal, \$5510; Canadian Trade Corp. Ltd., Montreal, \$13,741; Brunner Corp. Ltd., Toronto, \$37,461; Gray-Bonney Tool Co. Ltd., Toronto, \$29,700.

Hardware: Lynn MacLeod Engineering

Co. Ltd., Thetford Mines, Que., \$6973; James W. Pyke & Co. Ltd., Montreal, \$38,533.

Munitions: Defense Industries Ltd., Montreal, \$5127; National Steel Car Corp. Ltd., Hamilton, Ont., \$10,572.

Shipbuilding: Chantier Maritime de St. Laurent, St. Laurent, Que., \$9500; West Coast Salvage & Contracting Co. Ltd., Vancouver, B. C., \$20,207; Wright Shipyards, Vancouver, \$5975; Yarrows Ltd., Victoria, B. C., \$23,400.

Dockyard supplies: A. C. Leslie & Co. Ltd., Montreal, \$7862; Canadian Dredge & Dock Co. Ltd., Toronto, \$7300; Whitefield Engineering Co. Ltd., Toronto, \$7025.

Mechanical transport: General Supply Co. of Canada Ltd., Ottawa, \$8924; Dominion Truck Equipment Co. Ltd., Kitchener, Ont., \$14,524; Richardson Road Machinery Co. Ltd., Saskatoon, Sask., \$5871.

Aircraft: Air Ministry, England, \$10,000; Singer Mfg. Co., St. John, Que., \$62,500; Canadian Pratt & Whitney Aircraft Co. Ltd., Longueuil, Que., \$18,943; Canadian Vickers Ltd., Montreal, \$59,940; Canadian General Electric Co. Ltd., Ottawa, \$12,104; Hobbs Glass Co. Ltd., Ottawa, \$10,475; Wood Mfg. Co. Ltd., Ottawa, \$5332; Arrow-Hart & Hegeman Ltd., Toronto, \$11,495; National Steel Car Corp. Ltd., Malton, Ont., \$422,950; Fleet Aircraft Ltd., Ft. Erie, Ont., \$18,819.

Miscellaneous: Dominion Rubber Co. Ltd., Montreal, \$105,283; Panton Mfg. Co. Ltd., Montreal, \$58,400; Percha & Rubber Co. Ltd., Ottawa, \$58,400; Viceroy Mfg. Co. Ltd., Toronto, \$64,980; Robert Soper Ltd., Hamilton, \$58,400; General Steel Wares Ltd., Ottawa, \$10,598; Canadian William A. Rogers Ltd., Toronto, \$24,563; General Steel Wares Ltd., Toronto, \$169,650; Howard Furnace Co., Toronto, \$134,325; Iron Fireman Mfg. Co. Ltd., Toronto, \$220,440; Dominion Bridge Co. Ltd., Lachine, Que., \$38,082; Campbell Steel & Iron Works Ltd., Ottawa, \$7472; Horton Steel Works Ltd., Toronto, \$24,750; Steel Co. of Canada Ltd., Winnipeg, Man., \$12,536; Moose Jaw Heating & Plumbing Co. Ltd., Moose Jaw, Sask., \$27,113; W. C. Brennan Contracting Co., Hamilton, \$78,000; Bird Construction Co. Ltd., Regina, Sask., \$80,000; W. E. Emerson & Sons Ltd., West St. John, N. B., \$91,000.

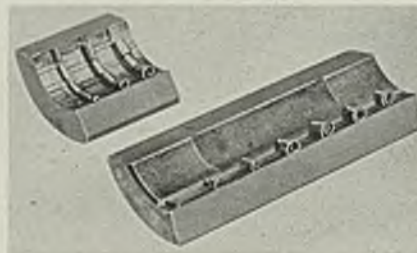
Construction projects: Magloire Couchon Ltd., Quebec City, Que., \$129,000; Scott Jackson Construction Co., Toronto, \$108,000; Pigott Construction Co., Hamilton, \$468,000; Ontario Construction Co., St. Catharines, Ont., \$382,000; Komo Construction Ltd., Quebec City, \$112,652; Storms Contracting Co., Toronto, \$337,350; N. B. Roantree Co. Ltd., Regina, \$89,349; Coast Construction Co. Ltd., Vancouver, B. C., \$210,110.

Correction—"Broaching To Beat Bottlenecks"

In an article entitled "Broaching to Beat Bottlenecks," which appeared in the Dec. 9 issue of STEEL, credit should have been given to National Broach & Machine Co., Detroit, for the photograph featured therein on Page 52 as Fig. 1.

That photograph, which is reproduced herewith, shows sectioned work in which broaches designed and manufactured by National Broach & Machine Co., were stopped midway in their strokes. The sections were then removed, care being taken to leave the chips undisturbed, each one attached to its work at its respective stage of formation, as the broaches were being pulled under regular operating conditions.

This method of sampling is practiced extensively by National Broach & Machine Co. in the course of developing and testing a wide variety of internal and surface broaches. In this instance it gives a practical demonstration of proper subdivision of typical broaching



cuts between several teeth acting progressively. These teeth, in the case of the lower sample showing a keyway in process, are arranged in line, while in the upper they are in staggered formation.

These samples also demonstrate clearly how correctly shaped teeth cause the chips to curl so as to take full advantage of the necessarily rather limited amount of chip room represented by the gullets between broach teeth. This chip curling ability is especially important on long work.

Malleable Castings Decreased in 1939

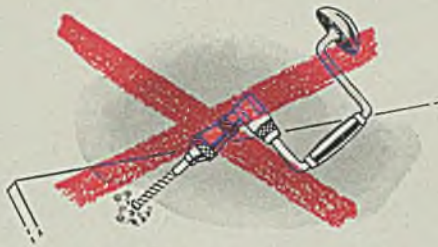
Manufacturers of malleable iron castings reported considerable decreases in employment, wages and production for 1939, as compared with 1937, according to the census of manufacturers. Wage earners engaged primarily in this industry in 1939 numbered 18,041, a decrease of 23.9 per cent from the 23,713 employed in 1937. Wages paid in 1939 totaled \$21,555,489, a decrease of 25.2 per cent from \$28,819,244 in 1937.

Value of products in 1939 was \$53,450,770, a decline of 23.1 per cent from \$69,515,605 in 1937.

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As far as assembly work is concerned, you can halve the time to delivery dates by changing over to the *fast* fastening method — with Phillips Recessed Head Screws . . .



1. Pilot holes eliminated. Start right out driving. You can use one hand to steady the work because . . .



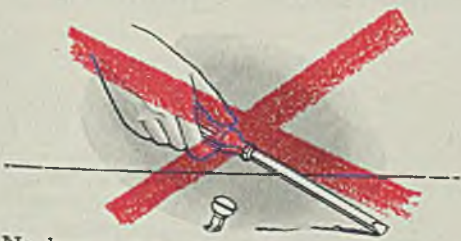
2. The Phillips Screw clings to the driver. Awkward places easily reached—without danger of fumbling.



3. No more crooked screwdriving, for the Phillips Screw drives straight automatically. Driving is easier because . . .



4. There is triple the contact between driver and recess. Power drivers are used more often because there is . . .



5. No danger of the driver slipping from the recess and gouging the finished surface. Phillips Screws set up tight . . .



6. Without burrs or split heads. Today, increased production requirements almost demand Phillips Screws. More firms standardize on Phillips every day. Get in touch with one of the firms below.

PHILLIPS RECESSED HEAD SCREWS



WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS
SPECIAL THREAD-CUTTING SCREWS • SCREWS WITH LOCK WASHERS

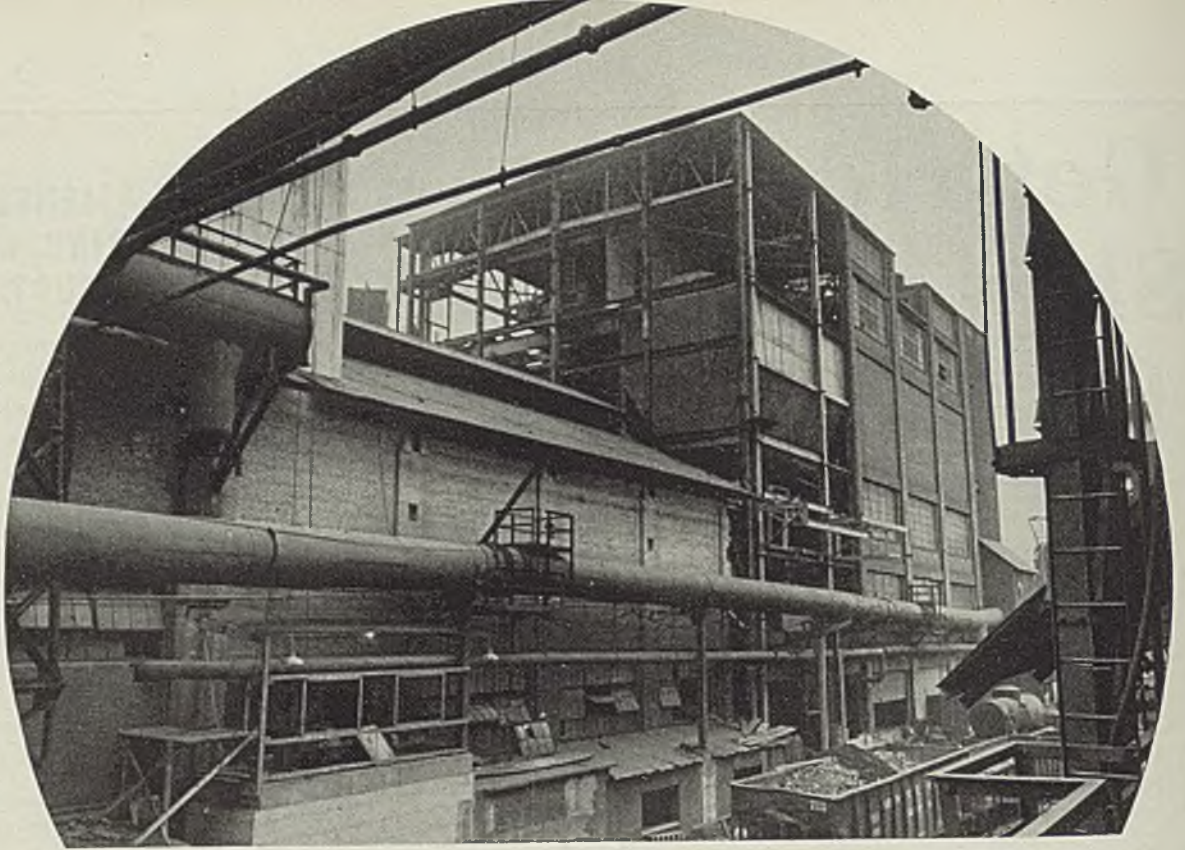
American Screw Co., Licensor, Providence, R. I.
Continental Screw Co., New Bedford, Mass.
Corbin Screw Corporation, New Britain, Conn.

The Lamson & Sessions Co., Cleveland, Ohio
National Screw & Mfg. Co., Cleveland, Ohio
Parker-Kalon Corporation, New York, N. Y.
Pheill Manufacturing Company, Chicago, Illinois

SPEED PRODUCT DELIVERIES BY CUTTING ASSEMBLY TIME

U. S. Patents on Product and Methods Nos. 2,046,341; 2,046,857; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338.
Other Domestic and Foreign Patents Allowed and Pending.

Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeproof Lock Washer Co., Chicago, Ill.



West elevation of complete boiler plant showing track hopper and skip hoist section of low-pressure boiler house containing four rebuilt boilers, and extension to high-pressure plant

Steel Mill Boiler Plants

Topping boiler system increases generated power with slight increase in fuel consumption without sacrificing investment of turbogenerators and other low-pressure steam equipment

■ POWER PLANT facilities are extended by the Weirton Steel Co., Weirton, W. Va. along lines initiated by it five years ago. At that time, the company introduced the "topping" steam plant to the steel industry, a practice which had already been used successfully by a number of power companies. Extension of these facilities further establishes the superimposed or topping boiler plant in steel mill application. Also confirmed in this power extension program is the successful use of hot process treated water for nearly 100 per cent make-up on high-pressure, high-rating boilers—another practice which the company pioneered in the industry.

This project, contract for which was awarded to the machinery division, Dravo Corp., Pittsburgh, includes an extension of the topping or high-pressure boiler plant, rebuilding of some low-pressure boilers

By I. W. VICARY
Engineering Department
Machinery Division
Dravo Corp., Pittsburgh



and demolition of others, and extension of the hot process water softener system.

The advantage of the topping boiler plant is that for a slight in-

crease in fuel consumption, an appreciable increase in generated power can be developed. This can be done without sacrificing the investment in turbogenerators and other steam equipment of low-pressure systems because the steam exhausted by the topping units retains the power necessary to operate the low-pressure turbogenerators. Topping units may either displace or supplement low-pressure boilers, and in the case of the Weirton installation some of the low-pressure boilers are continued in service to increase the total capacity and to utilize by-product fuel.

Weirton's topping boiler plant was placed in operation during 1936. The major equipment comprising the topping system involved two high-pressure Babcock & Wilcox boilers coupled to a General Electric turbogenerator. This is now being increased by one additional

DAYTIME BLACKOUTS

A Case Where a Valve Menaced Plant Operation

**SOLVED
WITH
PREVENTIVE
MAINTENANCE**

FROM his window the Superintendent of a chemical processing plant saw the stacks belching smoke that turned day into night. It happened before—just recently.

He suspected boiler trouble. "Maybe, there's one reason for production delays!" He grabbed a phone. "Why the blackouts, Bill?"

"The forced draft blower is acting up," replied the engineer, "the valve in the steam line's gone out again!"

Only a short time ago this valve was repaired. Yet, again, it was causing irregular boiler operation and fuel waste; in fact, it might have crippled the boiler completely! That's how Preventive Maintenance—the modern way of protecting against trouble by stopping it at the source—came into the case.

The engineer knew that valves shouldn't behave that way. But he wouldn't risk ordinary repair again. And through the Crane Man, R. B. H., he would benefit from Crane's wide experience and knowledge in applying the best corrective measure.

The first step in applying Preventive Maintenance is making sure that

valves and fittings are right for working conditions.

Here was a renewable disc valve in the steam line to a turbine-type blower. It couldn't stand the "gaff" of constant throttling. The disc wouldn't last. The draft blower ran wild!

Preventive Maintenance counseled replacement with a Crane No. 14 1/2 P—a plug type disc valve designed for tough throttling jobs. Its materials and construction would safely resist the ravaging effects of throttled steam. It would give unvarying control of flow—keep the blower running at constant speed.

RESULTS: No more blackouts even after two years. The menace of interrupted boiler operation, fuel waste, even complete shutdown was eliminated with Preventive Maintenance. Another user of piping knows that the Crane Man can help get most for piping maintenance dollars. Because, Crane is not only the source of valves and fittings for every need, but also of accurate information on their proper usage.

This case is based on the personal experience of R. B. H., a Crane Representative in our Minneapolis Branch.

TOUGH FLOW TAMED WITH CRANE BRASS PLUG DISC VALVES

In your boiler room—in any lines requiring severe throttling, you'll find these valves exactly right for the job. They're sound protection against trouble in blower, blow-off and boiler-feed services, in drip and drain lines.

The unusual stamina of these Crane valves is in their plug-type disc and seat construction. Materials are just the right combination for highest resistance to the corrosion and erosion of actual working conditions. The wide seating area repels the damaging effects of wire-drawing and foreign matter; assures long-lasting tightness. The tapered disc provides easy, positive regulation of flow.

With Crane Plug Disc valves, you can apply money-and-trouble-saving Preventive Maintenance to all the tough spots in your piping. They're available in a complete range of pressure ratings. For 150 pound services, specify the No. 14 1/2 P—in sizes up to 3 inches.



CRANE

CRANE CO., GENERAL OFFICES:
836 S. MICHIGAN AVE., CHICAGO
VALVES • FITTINGS • PIPE
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NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS



30% TO 40% STRONGER

● Cleveland Brand hexagon head cap screws made from 1035 steel, properly heat treated, are worthy of your investigation. Much stronger than ordinary screws, *they cost no more* in most sizes. Available from stock, fine or coarse thread, packages or bulk, all sizes. Ask for samples, Catalogue E and current discounts.
THE CLEVELAND CAP SCREW COMPANY, 2934 East 79th Street, Cleveland, Ohio.



CLEVELAND CAP SCREWS

SET SCREWS • BOLTS AND NUTS

Address the Factory or our Nearest Warehouse: Chicago, 726 W. Washington Blvd. ● Philadelphia, 12th & Olive Streets
New York, 47 Murray Street ● Los Angeles, 1015 E. 16th Street

high-pressure Babcock & Wilcox 400,000 pound-per-hour boiler and an additional Allis-Chalmers 12,500 kilovolt-ampere turbogenerator, along with accessory equipment.

Steam at 850 pounds pressure and 325 degrees Fahr. is generated in the topping boilers, using powdered coal, residual coke oven gas, and blast furnace gas as fuel. The steam passes through the back pressure turbogenerator, exhausting at about 210 pounds pressure and 525 degrees Fahr. This exhaust steam augments steam supplied by the low-pressure boilers to the old turbo-generators. Because of the efficiency of the topping cycle, and the extension of pressure and temperature range, additional power is generated for little fuel cost.

Uses Water Softener

To supply feed water for the high-pressure boilers, Weirton has used a Cochrane hot process lime and soda ash water softener. The company had been using this softener on raw Ohio river water for its low-pressure boilers since 1926 and was convinced that it would be practical for the new 850-pound pressure units.

With the use of barometric condensers on the low-pressure turbines, and other process requirements, there are virtually no condensate returns, the makeup being about 95 per cent. To increase the amount of condensate would have required a sizable investment in relocating the generator equipment to make room for surface condensers, and in the surface condensers themselves, as well as increased maintenance costs for their operation. Furthermore, process steam, which is a large item, would still be wasted. Accordingly, had it not been felt that high-pressure, high-rating boilers could be suitably fed with hot process treated water, the economies of the topping plant might not have been available to them.

The original softening system was



East elevation of high-pressure boiler plant extension. The duplicate Cochrane 160,000-gallon per hour softener is shown at right

rated at 160,000 gallons per hour, with the capacity of the tank providing a 2-hour settling time, and it is still the largest of its type in boiler plant service. This will be augmented by a duplicate softener and some additional filtering capacity, which will give the total softening system a nominal rating of 320,000 gallons per hour.

This duplicate softener incorporates improvements in design which have been developed since 1926, and as many of these improvements as can be adapted to the existing softener will be applied to improve its efficiency in heating and treating, and to reduce maintenance.

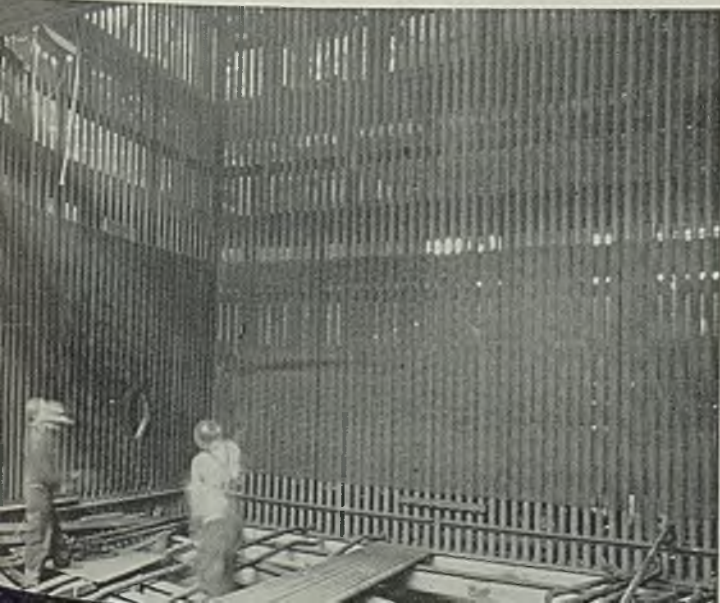
Actually, the 2-hour settling period is more than the usual cycle. The advantage of the liberal tank

capacity is that either tank can handle the complete requirements during those periods when the other is being cleaned and serviced—and it also provides considerable storage of treated water for emergencies that may arise.

The Dravo contract covers demolition of a 218-foot concrete stack; demolition of nine low-pressure boilers; extension of the high-pressure boiler house building; construction of foundations; furnishing coal handling equipment; complete piping job; installation of Cochrane de-aerating heater; re-tubing, re-drumming and re-setting of four low-pressure boilers which will be retained in order to dispose of coke breeze; and the indicated extension in the softener system.

Furnace water walls of a 400,000-pounds per hour, 900 pounds per square inch B & W boiler in the course of erection at the Weirton Steel Co.'s plant, Weirton, W. Va., shown at left

Progress view of air preheaters with complete boiler tubing in background



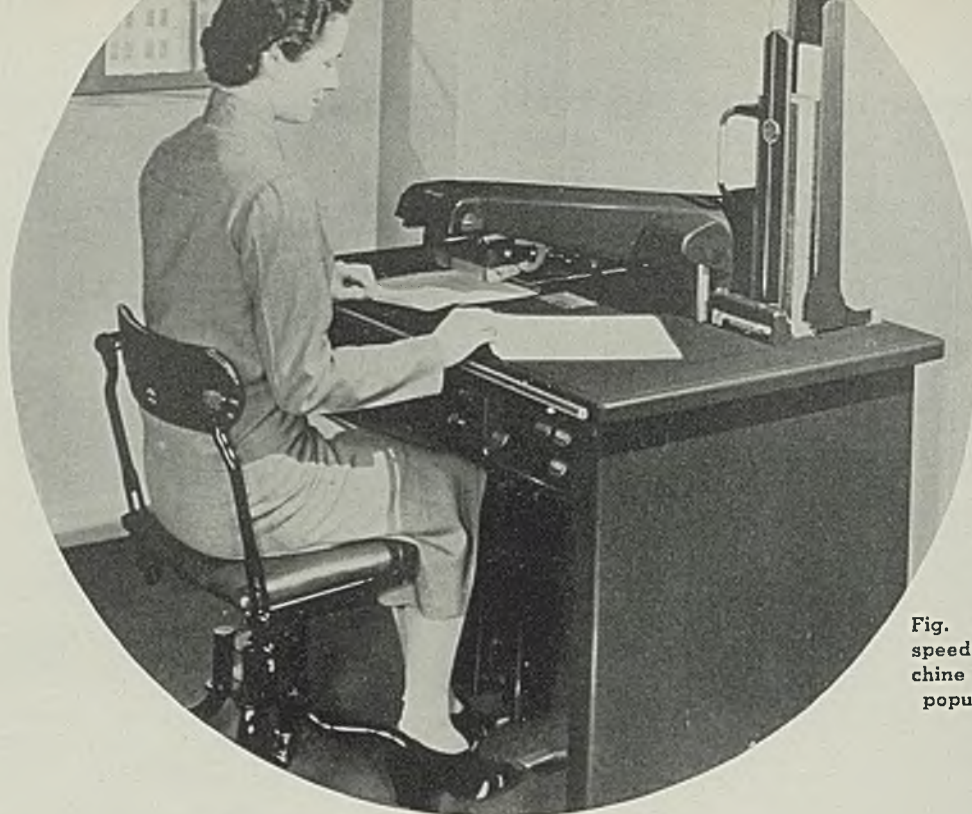


Fig. 1—Modern high speed addressing machine finished with the popular wrinkle finish

New Wrinkles for Business Machines

Although foreign markets dislike new finishes, American customers welcome durable modern coatings like wrinkle. Such a finish can be applied economically and has excellent appearance. Only precautions are that deep surface indentations and irregularities be avoided, that surface be chemically clean, that correct setting and baking temperatures be maintained

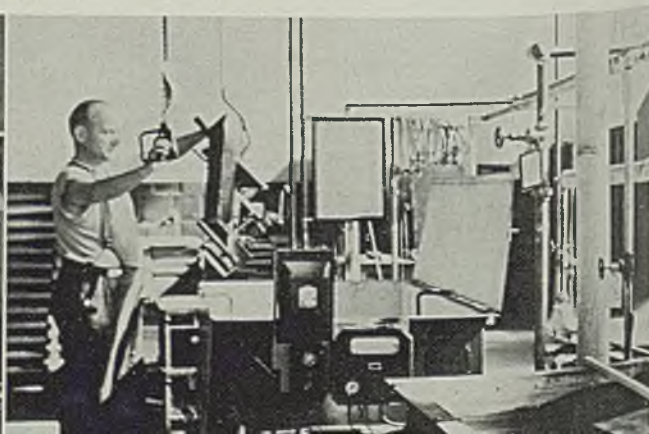
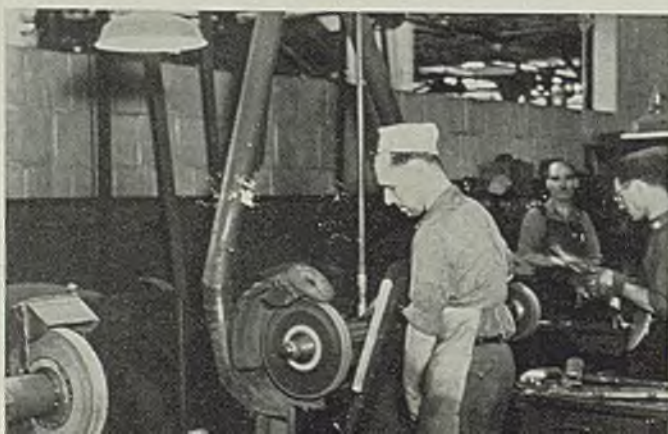
■ MANY years ago it was common practice to finish metal office appliances of various kinds in black japan. It was necessary to apply several coats to be baked in place, and when a high luster was required, the final coat had to be rubbed with pumice and oil, much after the manner in which varnished surfaces are commonly finished. The process was comparatively expensive. The baked japan finish still is used to quite an extent where it is necessary to apply striping or other ornamentation, generally by the decalcomania method. The decalcomania process is generally followed in finishing certain goods for export as the inhabitants of many foreign countries are highly suspicious of new finishes on

many of the standard goods shipped.

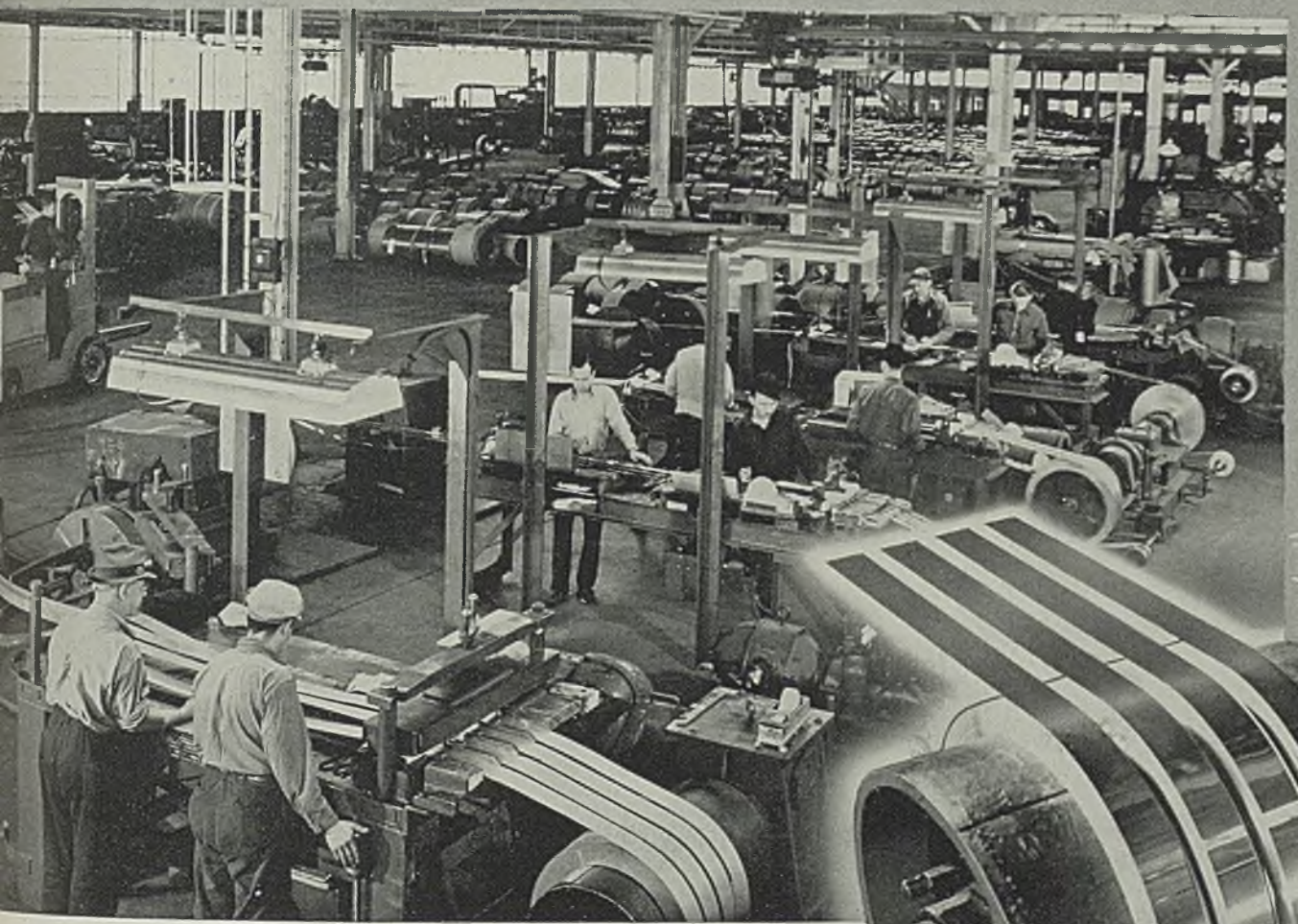
During the past few years, however, so-called wrinkle finishes have become quite popular. While such finished surfaces cannot be striped or otherwise ornamented, wrinkle finishes are well established as they are extremely durable and can be applied economically. Possibly typical of wrinkle-finish methods are those followed daily at the plant of the Addressograph-Multigraph Co., Cleveland, in finishing office equipment such as that shown in Fig. 1.

The first step in applying a satisfactory wrinkle finish is to make sure that the surface is free of deep indentations and other irregularities, such as those left by welding, for example. The operation in Fig. 2 consists of polishing Addressograph arms to remove weld marks. As is shown, the work is polished by hand. The wheel used is stitched muslin set up with No. 60 alumina abrasive. This wheel is run at a normal polishing speed of 6000 surface feet per minute. The No. 60 is coarse enough to cut rapidly without leaving objectionable scratches which might show through the subsequent finish.

Fig. 2. (Left)—Polishing Addressograph arms to remove weld marks. Fig. 3. (Right)—Liquid and vapor solvent cleaning assures adherence of the wrinkle coating subsequently applied



Steel- FIRST LINE OF NATIONAL DEFENSE



Republic Operates the World's Largest Stainless Steel Finishing Mill—

Ten years ago, Republic operated the world's largest stainless steel finishing plant. Each year it seemed to become smaller as ENDURO Stainless Steel found its way into new products—automobiles, trains, airplanes; chemical, textile and food processing equipment; home appliances and even fine jewelry.

Actually, the plant has been enlarged—now covers five acres of floor space—and much new finishing equipment has been added so that, today, Republic still operates the largest stainless steel finishing plant in the world.

Now, to the huge peace-time need for ENDURO for a wide variety of every-day uses is added the demand of industry working feverishly in the defense of America—

for bomb chutes in planes, galleys in naval craft, floats for flying boats and a host of other uses where high strength and heat- and corrosion-resistance are imperative.

Republic has looked ahead—has expanded all its facilities—and, fortunately for every man and woman interested in preserving our freedom, is able and anxious to help in the crisis that now squarely faces America—with more and better *steel—first line of national defense.*

The line of steels and steel products manufactured by Republic is so diversified that we have prepared a complete listing in Booklet No. 199. A copy will be sent you upon request.

REPUBLIC STEEL CORPORATION • CLEVELAND, OHIO
BERGER MANUFACTURING DIVISION • CULVERT DIVISION • NILES STEEL PRODUCTS DIVISION
STEEL AND TUBES DIVISION • UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY



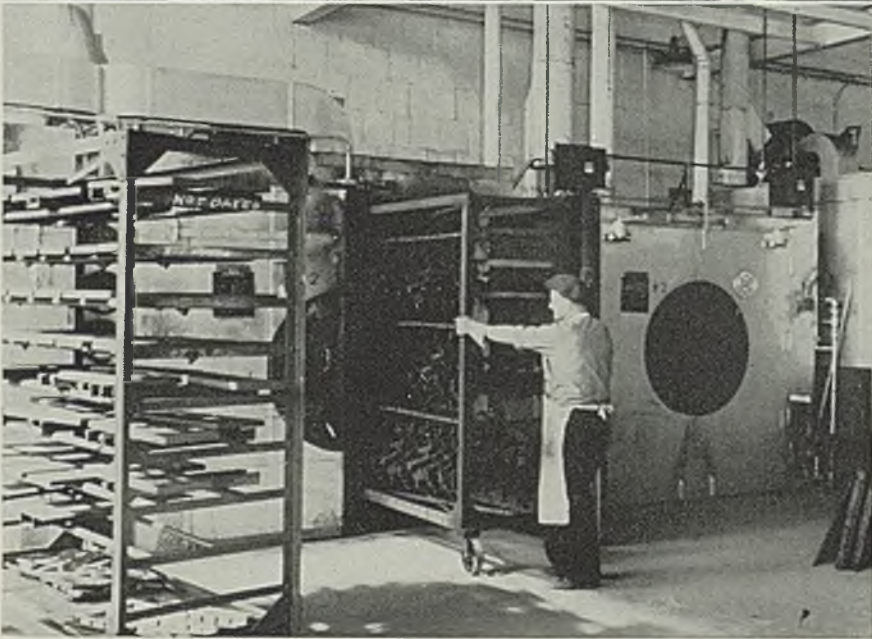
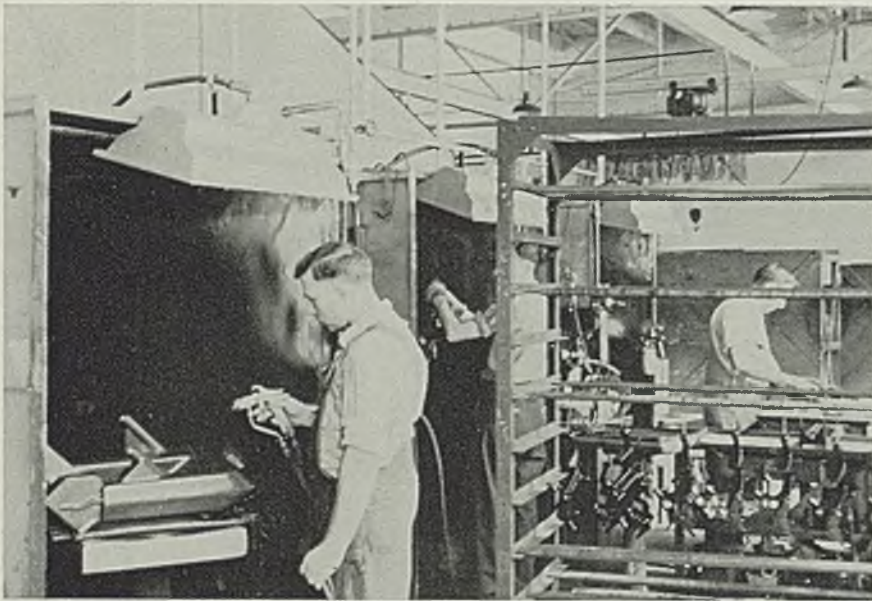


Fig. 4. (Upper)—Revolving fixture permits spraying finish on all surfaces easily without operator moving his position. Fig. 5. (Lower)—Baking at 200 degrees Fahr. expands the lacquer to produce the wrinkles. These then are hardened by a bake at 275 degrees

A dust removal system promotes general cleanliness.

After the parts are polished they are cleaned with lacquer thinner and small holes filled with a special filler preparation. Of prime importance in wrinkle finishing are clean surfaces, as the special lacquer solution employed will not adhere to a greasy or otherwise dirty surface. It is a fact that fingermarks have been known to cause a poor finish. Thus, the various parts must be cleaned thoroughly before the lacquer is applied.

Cleaning is accomplished as shown in Fig. 3. By means of an electric hoist the work is let down into a tank partly filled with Permachlor. This solution forms a

vapor that is heavier than air. Being hot, it never rises above the tank as cooling pipes are provided around the tank near the top. These condense the vapor at that level, the liquid falling back into the tank for reuse.

The next step after cleaning is to spray the lacquer in place as shown in Fig. 4. The work rests on a turntable so it can be revolved to reach all surfaces conveniently. Fumes and overspray are exhausted from back of the booth. At the right in Fig. 4 are metal racks on which the parts are placed for drying after spraying. The design of these racks is such that they can be wheeled into the bake ovens.

The two baking ovens in Fig. 5

are part of a battery of five. Both gas and electric heat are employed. The baking operation is simple. First the parts are brought up to a temperature of 200 degrees Fahr. and kept there for 30 minutes. Then the heat is boosted to 275 degrees and the parts baked for 90 minutes more.

This completes finishing operations. After the parts have cooled they are inspected and then they go to the machine shop for any machine operations that were not performed before applying the lacquer finish. The fact that the wrinkle finish is very durable permits parts to pass through certain machine operations without danger of marring the finished surface.

Last of all, what makes the finish wrinkled? In the foregoing process it is the result of a special oil base lacquer compounded for the purpose which expands to some extent when it heats during first part of the drying cycle, thus forming the wrinkles. These wrinkles, of course, set permanently in place during the final baking at high temperature.

Mirrors of Motordom

(Concluded from Page 36)

300,000 for Canadian plants, supplying principally special military trucks and transport equipment.

Speaking of the defense program generally, Alfred P. Sloan Jr., chairman, points out significantly that "it is not by reason of existing plant equipment that General Motors—or the automobile industry—is able to make its greatest contributions to the defense program. Rather, it is by reason of its knowledge of production techniques and processes of manufacture together with the skill and craftsmanship of its organization in dealing with intricate technical problems."

Those interested in devices for measuring the thicknesses of paint and other nonmetallic finishes will be interested in equipment now being used by Ford for this purpose. It is simple in construction, comprising a small metal case with two lead wires. One is connected to power supply, the other to a small spool-like measuring head. By touching the head to a flat or curved painted surface, an indicator is activated on a meter in the case. Strength of the magnetic field, varying according to the amount of paint between the magnet and the body steel, is registered on the meter, calibrated in fractions of an inch. Accuracy to 0.001-inch is claimed, and the gage is suitable for measurement of enamel, varnish, paper, celluloid, plastic or other nonmetallic coatings on iron or steel.

How Oxy-Acetylene Flame-Cutting

*can ease the burden
on your Machine Tools*

OXY-ACETYLENE machine flame-cutting is a means of shaping steel to relatively close tolerances — rapidly and economically.

Steel of practically any commercially used size or thickness can be cut in straight lines, circles, or intricate shapes, with cut edges so clean and accurate that a minimum of machining is required. In many cases, no machining is needed at all. This leaves your machine tools and machinists available for other needed work.

Some of the other advantages of flame-cutting are:

Operators of flame-cutting machines can be trained to do good work in a short time. The investment for equipment is moderate.

Less Dependence on outside sources of supply for fabricated parts is made possible by ability to make what you need as you need it.

One-of-a-Kind production for replacement or new-model development work is economically practical with flame-cutting, and is usually much faster than by other methods.

Parts Inventories can be held down, because almost any parts can be produced immediately as needed from stock steel.



Savings in Weight and bulk, and in most cases, increase in strength over parts fabricated by older methods are made possible by the use of flame-cut and welded parts.

Design Changes can be made quickly, without loss of time or money for new dies, molds, or patterns. Change-overs on flame-cut parts are only a matter of minutes.

Semi-Automatic cutting can be done by using easily fabricated templets which guide the blowpipe. The operator can also "hand trace" direct from a drawing.

Quantity Production can be facilitated by cutting numerous parts simultaneously — either by "stack-cutting" or by multiple blowpipe operation.

and how Linde can help you use it!

The Linde organization can supply you with small portable or large stationary flame-cutting machines. You can also obtain from Linde—oxygen, acetylene, carbide, and other essential materials for using flame-cutting, with the assurance of dependable, uninterrupted deliveries.

Even more important, Linde has the process ability and the organization to supply on-the-job assistance which will contribute to the technical skill and training of your operators.

If you want to know more about how Linde can help you use flame-cutting or other oxy-acetylene processes, ask Linde.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation



New York, N. Y., and Principal Cities

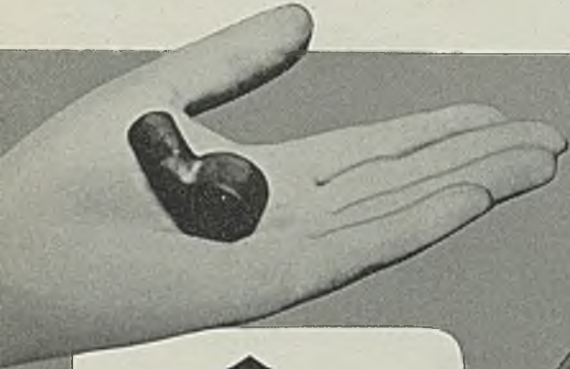
In Canada: Dominion Oxygen Company, Limited, Toronto

Linde can also help you make effective use of oxy-acetylene welding . . . hard-facing . . . flame-cleaning . . . flame-hardening . . . gouging . . . descaling . . . pipe-welding . . . Unionmelt welding . . . and other useful processes.

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OXWELD, PUROX, PREST-O-WELD APPARATUS . . . OXWELD SUPPLIES**

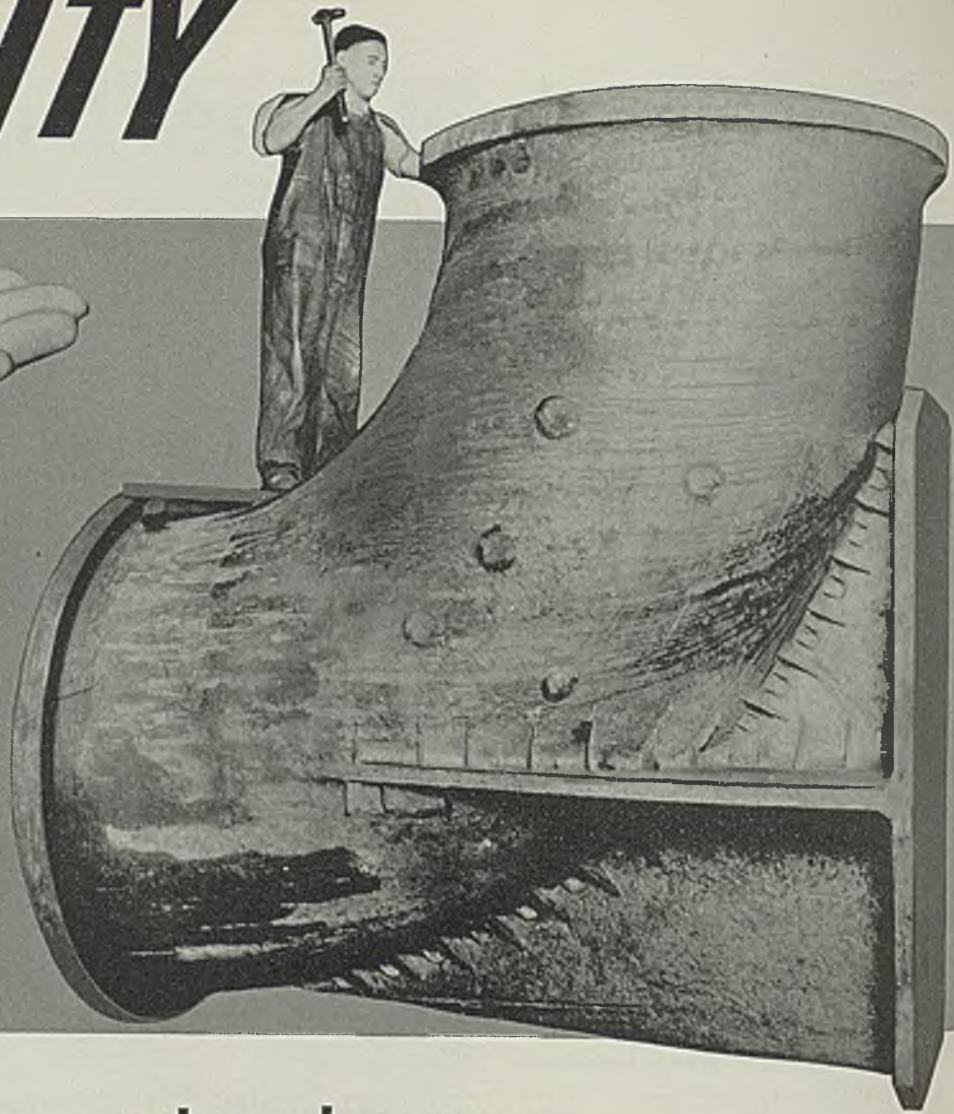
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QUALITY



Quarter-pound steel casting used as oil jet in high-speed marine engine.

Cast Steel Elbow, weighing 18 tons, for large Detroit pumping station.



By the ounce or by the ton with STEEL CASTINGS

Whatever you manufacture, Steel Castings can help you modernize and improve it—often with substantial reduction in cost.

A leading engineer says: "There is an advantage in the facility with which sections can be tapered and weight can be shifted to the positions where it will do the most good . . . Castings are not necessarily, as was so widely believed in the past, a second best substitute. They have engineering values in their own right, and in many uses, as for instance, where flow lines lead to failure, the lack of directional properties in castings makes them more enduring . . . The best

example is the use of steel castings for automotive gears. Moreover, steel castings lend themselves as readily to various heat treatments as other steels."

Industry is using, every year, a greater proportion of steel castings for thousands of purposes, wherever strength, stability and scientific weight distribution are essential.

It will profit you to consider these many advantages for your own products. Ask your local foundryman to give you the benefit of his experience, or feel free to write to Steel Founders' Society, 920 Midland Bldg., Cleveland, O., for suggestions and recommendations.

MODERNIZE YOUR PRODUCT WITH

STEEL CASTINGS

"Putting the Bee" on Crane Hazards

(Concluded from Page 52)

enough to protect motors against flashovers and wiring against fusing. For direct-current cranes with mill-type motors, the setting is usually 300 per cent of the hour rating. This also protects the crane mechanically.

Clothing: No man should be allowed on a crane at any time with loose clothing. Short overcoats should be kept buttoned at all times and tool belts worn on the outside. Overcoat belts should not be worn. Long overcoats are taboo.

Lighting: Crane lighting should be arranged so lamp changing is easy. Lamps should never be changed with the crane in motion or with the power on. The best method of mounting crane lights is under a hinged and guarded section of the bridge walkway.

Drums: Magnet drums also should be positioned so the electrician can safely service them. Many cranes now have small caged platforms between the girders at the end of the crane the magnet drum faces. The electrician has the trolley racked over to that end and services the magnet drum from the platform.

Trolley Shoes: Always lock out the main top switch before changing trolley shoes. Then check to see that the new shoes will not strike a bracket. Never try to hold more than one shoe at a time, one hand should always be free.

Motors and other parts that require changing

should have hand holes underneath the trolley to remove the bolts. In rare cases, units like limit switches may be fastened with tap bolts.

Motors: In changing motors make sure danger signs are in place and bumpers are on tracks. Rigging should be adequate, and pinions, brakewheels and other parts should be secure. The repairmen should wear hats and take particular care to avoid burns.

Grounding: Exposed noncurrent-carrying metallic parts of all electrical apparatus should be properly grounded. Grounding wires should be ample in size.

Miscellaneous Suggestions: Blocking of faulty electrical contactors should not be allowed. Blocking of overloads, overloading of fuses, overtightening slip gears and overloading of cranes should never be permitted.

The tonnage capacity of each crane should be marked plainly on the crane for each hook so it can be read from the ground, and no one but the superintendent or his immediate assistants should be authorized to make heavier lifts.

Electrical heaters should be located and guarded so they cannot start fires or cause burns. The space heater type, where the conductor is completely covered, is preferable. This type also should be protected by a guard.

And finally, rules regarding crane operation should be posted in the crane cab, and the crane-men should be continuously checked to make certain they know and obey them.

Cylindrical Grinders

(Concluded from Page 49)

cepted practice. Two or more surfaces on various other classes of cylindrical work also have been finished successfully by this means. It has even been employed on crankshaft grinding under certain conditions, as many as three bearings being finished at one setting.

Mention also should be made here of automatic cylindrical grinding machines. While such units generally are of a highly specialized nature, there are instances where they can be adapted to a diversity of operations. The value of such a machine primarily lies in the fact that the work carrier can be loaded and unloaded while grinding is in process. Where long production runs are the rule, such machines show efficient results.

"Is the grinding machine available for a given job an old model or a later development?" This is an important question to consider, and it should be borne in mind that some of the older models of grinding machines are not as efficient as modern units with improved mechanical, electric or hydraulic

control, hydraulic feeds, etc. If the flow of grinding jobs is intermittent, one of the older type of machines probably will serve the purpose well. It is poor policy to install an expensive machine if it is to remain idle a major part of the time. On the other hand, where production flow is heavy and continuous, hour after hour and day after day, the latest models will give more efficient results and so will quickly pay out.

A modern machine of the high production type introduced in a line of older machines is likely to be the victim of "bottleneck" conditions. If the output of the other machines cannot be stepped up materially, the new machine will be forced to remain idle part of the time or operate below peak efficiency. Under such conditions, an older model would serve just as well as far as output is concerned. If quality of work is to be stepped up, probably the whole line should be modernized.

The condition of a grinding machine has much to do with its output, both from the standpoint of number of pieces per hour and their accuracy. It cannot be expected

that a grinding machine can be operated year after year without showing wear. The platen ways sometimes wear to such an extent that the machine will not grind straight and grinding wheel spindle bearings eventually need attention. When a grinding machine fails to produce properly because of wear, it should be given a thorough overhauling under the direction of a competent mechanic who is familiar with the art of rescrapping ways and refitting bearings, and who can attend to such other repairs as may be necessary.

Sometimes this can be done in the maintenance department of a user plant. In other instances, repair men from the grinding machine manufacturer's service department had best be called in to attend to the necessary repairs. An old grinding machine is given a new lease on life when properly reconditioned. However, it cannot be expected that old tools can be reconditioned time after time and always brought back to peak efficiency. Eventually the day comes when it is advisable to throw them out and install new equipment.

(Concluded Next Week)

New Type Raise-Lower Overhead Cab Simplifies Handling Greatly

■ ONE OPERATOR now may take care of all operations involved in moving materials with the introduction by Cleveland Tramrail division of Cleveland Crane & Engineering Co., Wickliffe, O., of a new type of Tramrail carrier equipped with a "raise-lower" cab. It is available in two general forms—one form raises and lowers the cab and load together—the other raises and lowers the cab and load independently of each other. Which type to use is contingent upon the service and materials to be handled.

If the materials are of such nature that a lifting fork need be employed, one operator can handle the job—as with a crane hook.

The unit shown in the accompanying illustration handles unwieldy loads of cork. Both cab and load hook are operated independently of each other. During the day shift when large quantities of cork are required to keep up the production, the cab is kept in the upper position firmly attached to the carrier. Three men are then employed—one for attaching loads, one for detaching at the receiving end and the third

for operation of the unit. During the night shift when the demands for materials are not so great, the cab operator alone, through use of the raise-lower cab, takes care of the entire job.

The unit here has a vertical travel of 40 feet for both cab and hook; however, it can be furnished for operation from much greater heights. The load hoist, the cab hoist and the carrier are all motorized and controlled from the cab. This particular unit is arranged so it cannot be traveled until the cab is in the high position.

For handling heavy kegs, sacks, etc., in and out of a stockroom or warehouse, the use of a lifting fork and pallets often provides the best and most efficient means. The fork may be connected to the cab, so that both move together, enabling the operator always to be abreast of the load—not above or below it. He then has no difficulty thread-

During the night shift when production demands are slower, this raise-lower cab enables operator to load, transport and unload materials single-handed

ing the fork under the pallets of materials, as is so often the case with other types of equipment which keep him at a distance of 10 to 15 feet (either above or below) from the work and prevent him getting a proper view.

Overhead units having the cab connected to the lifting fork or other similar material handling devices, are generally arranged so they may be traveled even when the cab is suspended at a considerable distance below the carrier. This enables the operator to steer his lifting fork into or away from the load on the floor or on top of a high pile with precision—as the situation demands.

A salient advantage of the raise-lower cab carriers is their aid to safety. With their use, piling height is not limited and the operator is just as safe 60 feet above the floor as 10 feet. The highest tier of the pile can be piled just as level and securely as the tier resting on the floor. These raise-lower cab carriers are especially suitable for the handling of kegs, drums, sheet steel and a great many other products.

Stainless-Sprayed Parts Provide Added Life

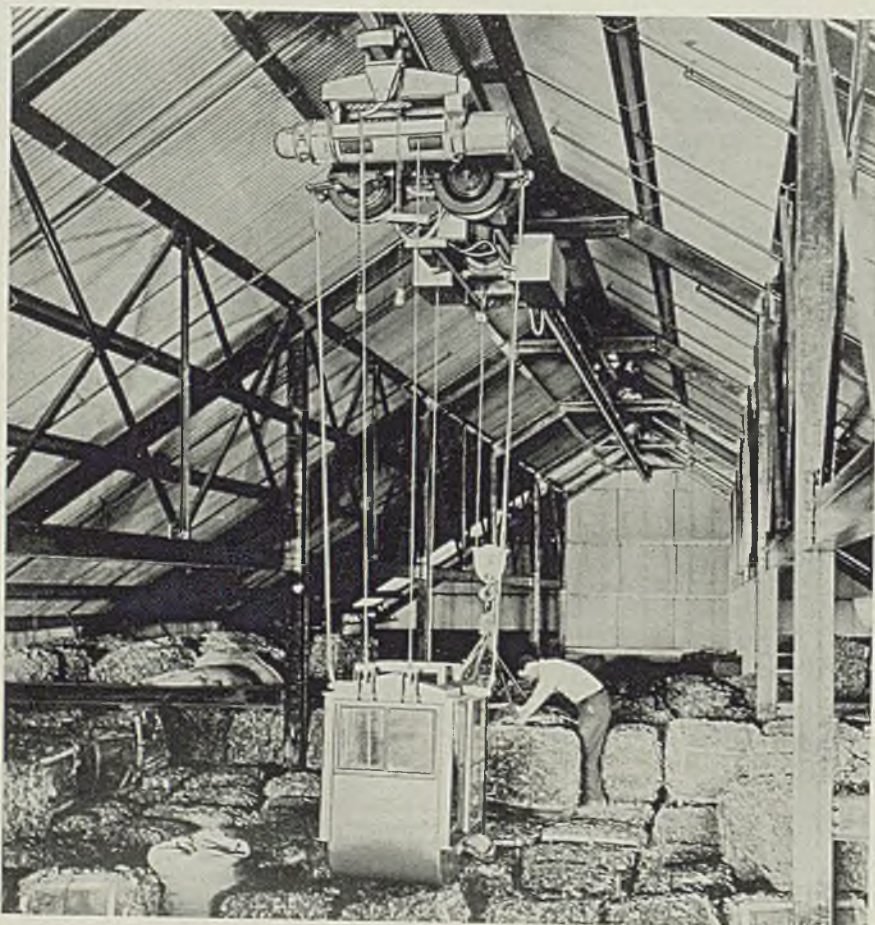
■ Spraying worn parts with stainless steel by a metallizing process and remachining to size, is producing reconditioned parts giving from 100 to 300 per cent their original service life on a well-known mid-western railroad.

Many locomotive parts, which would normally be scrapped, are being reclaimed and reconditioned by this process—as well as such parts as shafts, water pump piston rods, motor armature shafts, etc.

In practice, 18-8 stainless steel wire for metallizing is fed into the back of a gun equipped with an air turbine supplying power to two knurled rolls—feeding the wire through the gun into the center of a neutral oxyacetylene flame. By adjusting the speed of the wire through this flame, a fine atomization and even deposition on the worn parts are obtained.

Prior to the spraying, all surfaces are sand blasted, using a 30 mesh steel angular grit, which not only thoroughly cleans, but also roughens the surface and enables the sprayed metal to adhere to it. The spray is applied to a depth of 1/64 to 1/32-inches per side in excess of the size to which the part is to be machined.

To obtain the fine finish desired, the sprayed metal finishes are turned at high speeds—from 200 to 450 feet per minute—with fine cuts and a slow feed. For turning operations, Carboloy tools are used. On parts that cannot be turned, the surfaces are finished by grinding from the rough.



MR. A. is a parts manufacturer. He is bedeviled with production problems. His costs are running up to where they are eating big holes in his profit. Like anyone else, he's interested in profits.

MR. B. makes electrical appliances. Ask him what his troubles are and he'll tell you that another manufacturer is getting the business. He can't get "Box Office" appeal into his product.

MR. C. says that his new designs would sweep the market clean . . . if he could only produce them. He has a fabricating problem that really has him bothered.

MR. D. makes specialties. But so do a lot of other manufacturers make specialties. His big problem is getting prices down to where he can compete and make a fair profit.



4 MANUFACTURERS 4 PROBLEMS

1 Simple Answer

HERE are four pretty stiff questions. Yet the one answer to all of them is American Quality Cold Rolled Strip Steel. This product answers Mr. A's problem because it fabricates easily, at high speeds and at low cost.

Mr. B., who is looking for "Box Office," will find that American Quality Cold Rolled Strip Steel has a smooth, eye-appealing finish that will give his product a front row seat in dealers' displays. As for

Mr. C.—our Cold Rolled Strip Steel is available in a complete range of widths, edges, tempers and finishes, which answers his problem. And the fact that this product is a comparatively inexpensive raw material, along with its other advantages, should take care of Mr. D.

Whether you make complete products or parts, our engineers and metallurgists can be of help to you. Call American Steel & Wire Company—today!

A M E R I C A N S T E E L & W I R E C O M P A N Y
Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, Pacific Coast Distributors

United States Steel Export Company, New York

AMERICAN *Quality* **COLD ROLLED**

STRIP STEEL



**UNITED
STATES
STEEL**

Here Are the Reasons Why Mr. Mills Says

“Efficient Handling Is Your Best Bet for Beating Bottlenecks”



Not only does efficient handling mean better utilization of production and storage space but it directly aids production by relieving highly trained operators from time-consuming 'placing' of work—gives them more time for actual production. Too, an important by-product of a good handling system is a significant reduction in losses charged to 'damage in transit.' Mr. Mills explains how he cut these losses 75 per cent in his plant

(Concluded From Last Week)

■ MULTIPLE-story buildings where fork trucks are used on each floor permit use of a system inaugurated to eliminate time wasted waiting for elevators. A time study made of elevator operations revealed that 20 per cent of each truck driver's time was wasted either waiting for elevators or riding with his truck between floors.

This lost time has been eliminated entirely by assigning each fork truck to a floor, and leaving it there. Pallet loads of material to be moved between floors are placed on dollies and left beside the elevators. Then the elevator man pushes the loads

By E. J. MILLS

Supervisor, Plant Transportation
Pittsfield Works
General Electric Co.

on and off the elevators at the proper floors where they are handled by the fork trucks on those floors. This system not only eliminates nonproductive time for trucks and drivers riding elevators, but increases pay load capacity of the ele-

vator as well. Under the old system, one pallet load of material and the small fork truck could be carried on the elevator. But with the dolly method, four pallet loads may be carried on each trip. This increase in pay load obviously improves the efficiency of the elevators and also speeds up the delivery of materials between departments.

Stockrooms laid out for manual handling of materials often are unsightly, overhead space is wasted

Fig. 6. (Left)—Stockroom of well-ordered appearance where work is handled by fork truck. Note aisle space for handling incoming and outgoing material.

Fig. 7. (Right)—Cartons, a difficult former handling problem, involve no difficulty for the fork truck when handled on pallets as shown here



PRODUCTION MEANS PROTECTION



" from F.P.G."

NOT since '17, when welding answered industry's call for stepped-up production, has there been so great a need for a welder that can really turn out bonus welding!

G.E. is proud to present to industry an entirely new line of a-c welders with these important advantages:

1. Greatly improved power-factor—reduces installation costs, saves power, reduces demand-charges.
2. Finger-tip current adjustment—saves effort and time.
3. Stepless current adjustment—provides precise setting.
4. Large scale readily indicates current adjustment.
5. Cover protects output terminals, cable, and the operator.
6. Open-circuit voltage of 75 volts combines additional safety with easy welding.
7. Fan-forced ventilation—provides cool operation—saves weight and floor space.
8. Practically NO maintenance—annual lubrication.

Use these **NEW**
A-C WELDERS
to help increase
production and
improve quality!



New 300-amp. a-c welder, transformer type, similar to the 500-amp. size. Running gear for portability is available

General Electric Company, Section B 672-24
Schenectady, New York.

Please send me, free of charge, your Bulletin GEA-3532, covering complete details on these new A-C welders.

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Company.....

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GENERAL ELECTRIC

and the general congestion easily blocks all aisles necessary for proper delivery and withdrawal of materials.

Fig. 6 shows the neat interior of a stockroom employing a fork truck to handle material. The truck also services manufacturing on the same floor. Since this stockroom was on an upper floor, a lightweight fork truck was assigned to the job. Its small size was especially effective in the limited areas of the stockroom.

Many steel containers were purchased for handling small machined parts, and pallets were provided for

materials received in cartons, bags and drums.

Fork truck handling in this stockroom has eliminated all manual labor in transferring materials, has relieved congestion by providing proper aisles, has improved the appearance of the stock, and the more orderly arrangement has made it possible to inventory the material more easily and with greater accuracy. Material handled on pallets can be tiered to afford a barrier for the stockroom, eliminating need for fences and providing more storage area also. Fork truck stacking, utilizing the space near the

ceiling, made the aisles possible by releasing 25 per cent of the stockroom floor area.

Handling Cartons: Due to the fragile material being manufactured in many departments at Pittsfield, the products are packed in corrugated cartons. Handling these cartons continues to be one of our most difficult problems. Each department may require 30 or 40 different sized cartons, each with 5 to 11 interior parts. Much floor space is necessary to handle the average carton stock on a manufacturing floor. Each bundle must be handled by hand, the area is unsightly and it is difficult to keep inventories up-to-date.

Fig. 7 shows this same stock handled in fork truck containers and using much smaller space. In addition to the space saving, hand labor has been eliminated, the appearance of the area has been improved and inventory is a simple matter since each container holds a fixed number of complete cartons, including all interior spacers. At the present time, cartons are received in box cars and tied in bundles with several thousand small bundles in the car. All these bundles have to be unloaded and handled several times by hand—an unsatisfactory method. We are negotiating with the carton manufacturers at present in an effort to have cartons shipped in unit loads of complete cartons that may be unloaded with fork trucks, and handled by fork trucks through storage to the manufacturing floor. This will afford an important economy.

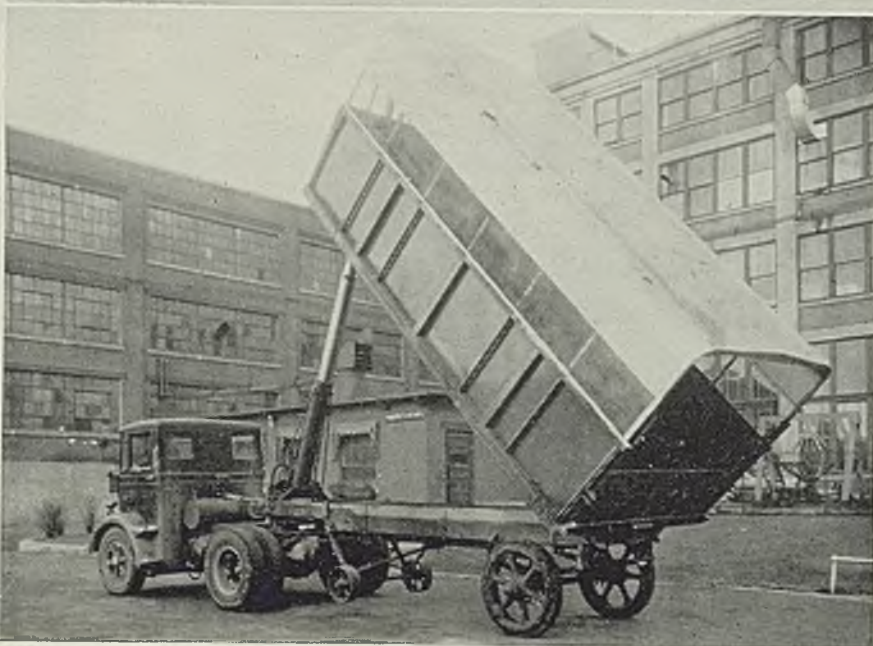
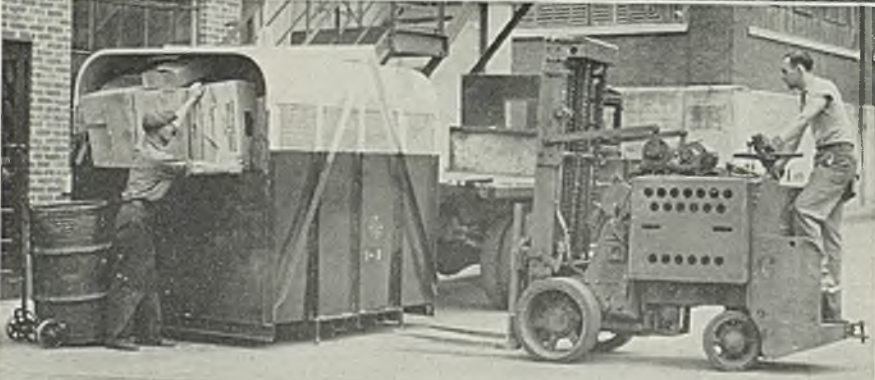
To Reduce Breakage: One phase of fork truck handling that seems to have escaped general notice is the reduction of losses due to breakage in handling. The elimination of numerous hand loadings and unloadings reduces the opportunities for carelessness. We were interested to note that since the inception of the fork truck system, our losses charged to "damage in transportation" have been cut 75 per cent each year. In a large manufacturing plant, such a saving is a considerable item indeed.

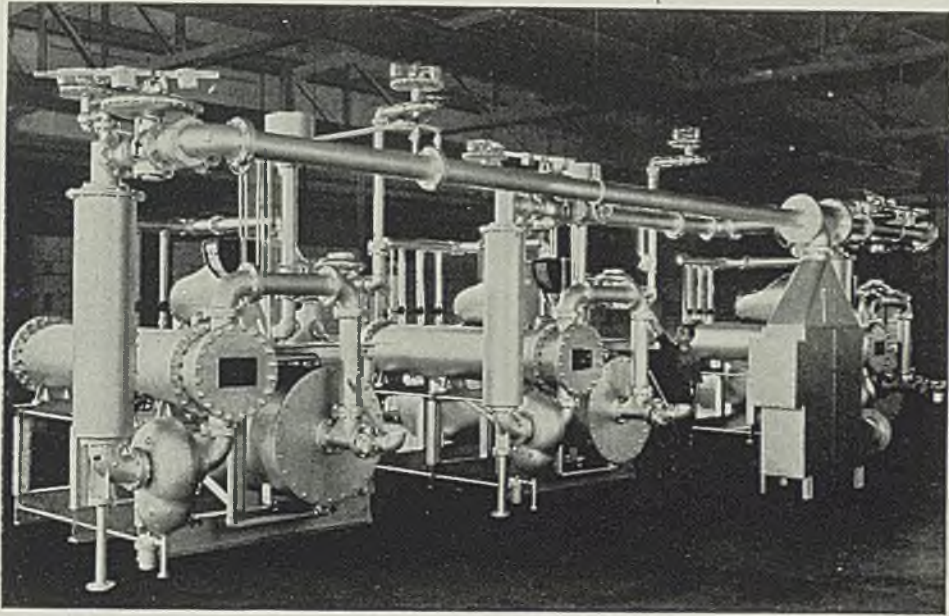
Rubbish Handling: We try to handle our rubbish, refuse and sweepings with as much care and

Fig. 8—This rubbish collector unit, top, has a body removable by fork trucks as shown in Fig. 9, center. This affords easy access in loading it

Fig. 9—Showing fork truck handling removable truck body and how easily the body can be loaded when deposited at ground level

Fig. 10—This 24-yard refuse trailer with hydraulic dumping mechanism is used to serve multi-story buildings where considerable volume of waste is very often involved





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Outstanding in late developments in bright annealing is the Kemp Atmos-Gas Producer, controlled by the Kemp Constant Analysis Monitor, an "electrical nervous system" that maintains inflexible standard.

In this reliable, time-tested equipment, operators find the guardian of forced-draft production, accuracy of control that will hold to a consistent new low. Write for Bulletin 101.14. **Address The C. M. Kemp Mfg. Co., 405 East Oliver St., Baltimore, Maryland.**

KEMP of BALTIMORE



Fig. 11. (Left)—Removable dump body handled inside plant by fork truck. Fig. 12. (Right)—Tractor-trailer setup for handling salvage. Note dump hoppers on third and fourth trailers

thought as we spend on work in process. The time and money spent on good housekeeping add nothing to the value of the product. But since the expense is inevitable, an effort must be made to keep it as low as possible.

Some plants still use an adaptation of the municipal ash removal system to handle rubbish. With this system, sweepers fill barrels in the shop, and then hand truck them outside the buildings to be picked up by highway trucks. This method has been found obsolete in the Pittsfield works due to several glaring defects in the system.

Rubbish Unightly

In the first place, barrels of rubbish and broken crates standing outside buildings are unsightly. The longer they stand, the worse the plant will look due to the scattering of refuse by the wind. During the loading process, still more refuse is spilled. And if filled barrels are taken to the dump to be emptied, the return trips with empty drums are a continual nuisance.

The Pittsfield rubbish system employs two types of rubbish containers. The inexpensive container, Fig. 8, will haul 10 cubic yards. This unit, as shown in Fig. 9, is placed on the ground by a fork truck where it is easily accessible to the sweepers. When filled, a fork truck places it on the dump truck where it is held in place by two pieces of chain at the front end of the dump body. From then on to the fire dump, it is handled as any standard dump body.

The large 24-cubic yard semi-trailers, Fig. 10, are kept at multiple-story buildings where there is a large collection of rubbish concentrated in one ground area and handled up and down from the different floors on elevators. The small 10-cubic-yard containers, shown in Fig. 8, are used in single-story buildings where a large number of small units is more efficient because of the distance traveled by the sweepers from their departments. This system also helps the sweepers to retain several

favorite sweeping cans which are in good shape and eliminates the necessity of hauling hundreds of empty sweeping cans back from the fire dump to the factory for further use.

Another adaptation of this method is used to handle dirt, broken concrete and the like from excavations. Under the old system, this material was loaded into wheelbarrows and dumped outside the building on the ground to be shoveled up again into a dump truck for disposal.

At the present time, such excavated material is shoveled directly into a container, Fig. 11, which is handled out of the building by fork truck and placed on the same truck that handles rubbish and road sweepings, to be hauled to the dump.

Spoilage and Waste: Good housekeeping practice demands that metal turnings, chips and other waste be moved promptly from the factory floors. And good salvage practice demands that these waste materials be delivered in the best possible condition for sale to scrap dealers. One division of the materials handling department is concerned with these two problems. Prompt removal of spoilage and waste is assured by scheduled cleanups in all departments. Proper containers are provided for all classes of material to insure convenient loading, handling and dumping in the scrap and salvage department.

Delivery of waste materials to the salvage department in good condition is assured by the use of stenciled containers for difficult classes of material. Too much emphasis cannot be placed on the necessity for keeping the waste material properly segregated since as much as 30 per cent of the scrap value may be lost if material is received mixed.

Fig. 12 shows waste boiler plate being handled from a tank shop inside dump trailers. This material is loaded in the trailers stationed

beside the shears or burning racks and so is not handled again until it is dumped in the proper bin in the scrap and salvage department. The third and fourth trailers in line have brass and copper turnings in dump skids loaded on trailers. Each container is stenciled for one class of material, and only that class of material is permitted to be loaded in that container.

These containers are handled out of a multiple-story building with a fork truck, and loaded on the trailer for delivery to the scrap and salvage department. Upon arrival there, another fork truck unloads the containers and either dumps the metal in bins or loads it directly in cars.

Small lots of miscellaneous spoilage and waste are placed on pallets which are loaded on trailers for delivery to the scrap and salvage department where they are unloaded by fork truck, the material sorted and prepared for sale.

The handling of spoilage and waste is carried out on schedule the same as production material. It deserves fully as much consideration if a good job is to be done. The materials handling and scrap and salvage departments work in close co-operation to attain the two principal results of good scrap handling:

Efficient removal of waste materials from the factory floor.

Proper segregation of waste materials to obtain highest possible scrap value.

Therefore, it will be seen that with a centralized materials handling department in any manufacturing plant, the same kind of supervision and application of modern equipment is applicable from the time the material is received at the plant, through all manufacturing processes, to final shipment of the finished product. Equally important is the handling to disposal of waste and salvage.

4 to / Longer Service

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ENDWELDUR Sling Chains withstand the effects of elevated and sub-zero temperature, of moderate impact loadings and of bending and gouging.

The welding of each link at the end instead of the side means that each entire link is normalized and that it hinges perfectly. The metal of the chain is freed of internal strains—and no unnatural strains are added when the links hinge on one another.

ENDWELDUR has thoroughly proved itself in laboratory and field—and is ready to prove itself in your service.

The American Chain line includes iron chains as well as steel and alloy chains.

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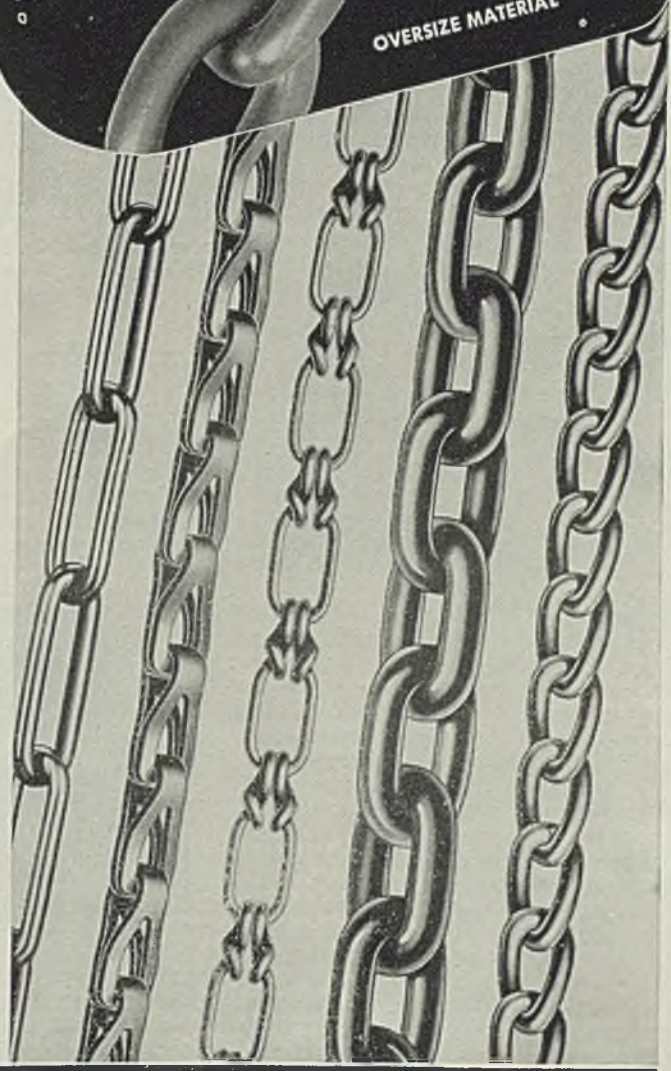
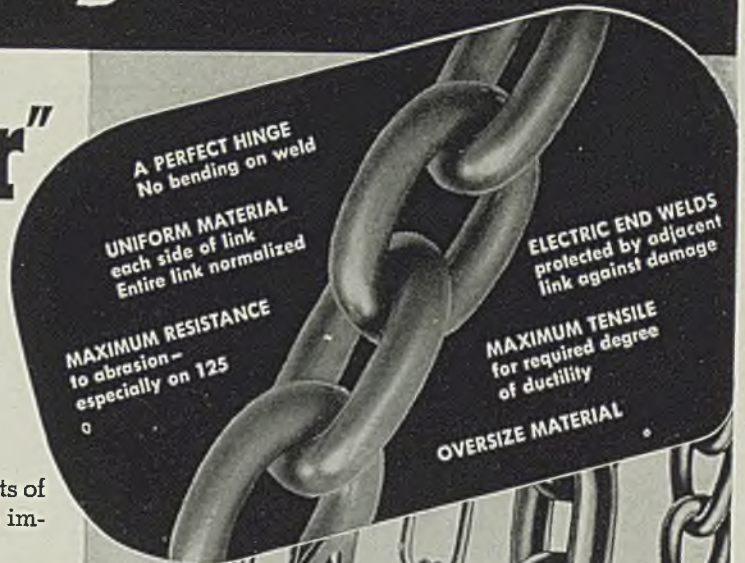
American Chain engineers serve you in two important ways. They provide the best chains for countless purposes—and they work with you to put the most suitable chain equipment to work in the best way. They invite you to discuss your chain problems with them.

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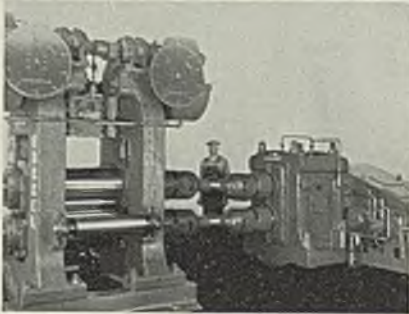
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Cold Strip Mill

■ Farrel-Birmingham Co. Inc., Ansonia, Conn., announces a new 20 x 32-inch 2-high cold strip mill for high precision rolling of aluminum, aluminum alloys, duralumin and other nonferrous metals. Its rolls and mill pinions are connected by universal spindles, to eliminate shock, looseness and end thrust between the pinion stand and the rolls. The mill housings are of the arch-top type, made of cast steel. The bases of the screwdown housings are cast integrally with the mill

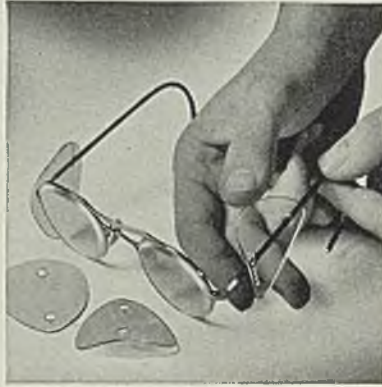


housings. The latter are carried on heavy stringer bedplates and, at the top, are securely bolted together by a cast steel stretcher, on which is mounted the screwdown lubricating pump. A double motor screwdown built into the housings, provides ease of manipulation and facilitates setting the rolls with extreme accuracy. Adjustment can be made against the metal while the mill is in operation. Separate operation of each screw, or the synchronization of both is provided by a magnetic clutch. The screwdown gearing is enclosed and lubricated by a continuous circulating system. On the entry and delivery sides of the mill are mounted collapsible block reels. The reels are driven by direct-current motors, interconnected with the main mill motor. They provide constant tension from empty to full reel. The mill is driven by a direct-current, variable speed motor, through an enclosed double reduction drive with integral pinion stand.

A built-in oil pump, equipped with filter, provides lubrication of gear teeth and flood lubrication of bearings. A Gearflex coupling connects both the motor and drive.

Goggle Side-Shield

■ Kimball Safety Products Co., 7314 Wade Park avenue, Cleveland, has introduced a cellulose acetate side shield for use on workmen's



spectacle protective goggles. It is made from strong plastic material either clear or tinted to reduce glare. The shield provides added protection against particles getting into the eye from the side. Inexpensive, yet durable, it is easily applied or replaced by merely slipping it on over the temple or ear piece.

Arc Welders

■ Allis-Chalmers Mfg. Co., Milwaukee, has added a Junior size to its line of Weld-O-Tron low current electronic arc welders for a range of 5 to 40 amperes. It is for those plants already equipped with motor generator welders that handle cur-



rents as low as 35 to 40 amperes. This smaller size uses electrodes as small as 1/32 and 3/64-inch in diameter. It is especially suited for welding gage sizes from Nos. 32 to 18, and is capable of handling material as thick as No. 14-gage. The welder consists essentially of a 3-tube poly-phase mercury vapor rectifier circuit. Readily accessible controls and terminals are located on the front panel. A hand-wheel with easily read

dial provides fine adjustment of the welding current. The constant current characteristic of the company's larger unit has also been given to the Junior model—making the arc easy to start, easy to hold and producing an optimum heat condition at the weld.

Tool Grinder

■ Thomas Prosser & Son, 120 Wall street, New York, announces a heavy duty carbide tool grinder which embodies features for grinding the heaviest tools, together with provision for wet grinding. When roughing, it removes metal rapidly. It also finishes all single point tools to smooth, keen cutting edges. The machine's wet grinding equipment provides a copious flow of water, keeping the tools cool—permitting much faster grinding. The equipment consists of a coolant pump, pan and settling tank, with all brass piping, valves, and nozzles. The nozzles are arranged so that the flow of water can be directed on



the tool, regardless of which side of either wheel is being used. Quick-acting indexing tables, permit instant setting to the desired angle. The grinder's spindle runs in double-row, self-aligning bearings. It is driven by double V-belts. The grinder may use either diamond or silicon carbide cup wheels on either end. The cup wheels are mounted on steel backing plates, and their location on the shaft is adjustable to compensate for wheel wear. The motor is enclosed and is supplied with a drum type on-off-reverse switch.

Brush Refill

■ Steelgript division, Fuller Brush Co., Hartford, Conn., has placed on the market a new type of brush construction which enables it to be used for many special applications. The development in reality consists of two developments—a grooved steel core and a steel-backed brush. The steel-backed brush consists of bristles embedded in a metal strip

IT'S A FACT

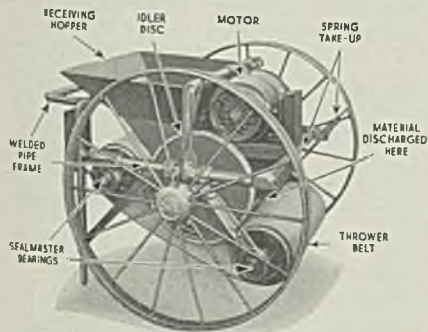
to form a brush. This metal strip is designed so it can be slid in a groove of the grooved core. This permits a manufacturer to refill the core with a new brush whenever the old one is worn or damaged without dis-



mantling the core. The metal-backed brushes or refills can be kept in stock for any emergency. Cores and brushes are available for box wrapping machines, car washing equipment, polishing machines, conveyor belt cleaning units and a number of other applications.

Loader and Piler

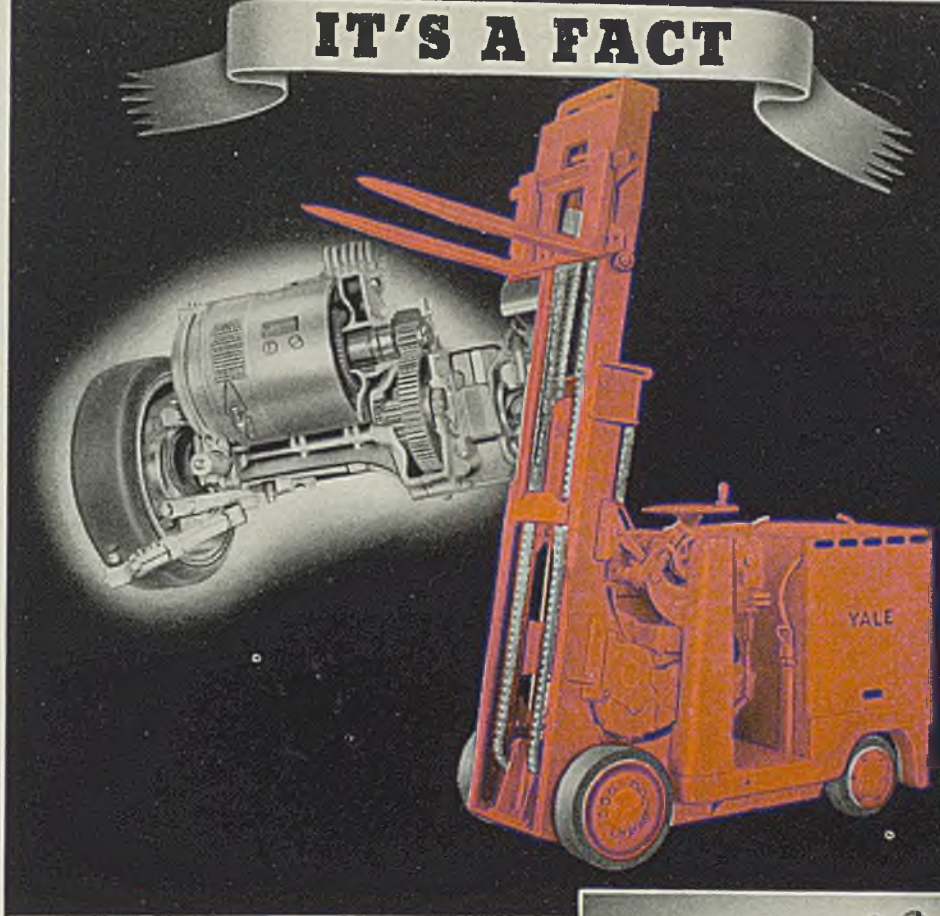
■ Stephens-Adamson Mfg. Co., Aurora, Ill., has introduced an improved S-A loader and piler for loading bulk materials into box cars and into piles. Due to the dusty conditions under which this machine normally operates, it is now equipped with Sealmaster permanently sealed, self-aligning, prelubricated ball bearing units. Also a new simplified



means of adjusting the alignment of the belt has been adopted. As shown, this loader operates with a fast moving, dished belt. To facilitate adjustment of this alignment, a screw control now protrudes from the bearing through the front of the loader frame. An additional feature of this unit is its streamlined pipe frame.

Photoelectric Relay

■ General Electric Co., Schenectady, N. Y., has introduced a new photoelectric relay which will operate at speeds up to 150 interruptions per minute and at a minimum of 40 foot-candles at the phototube with not



YALE ELECTRIC TRUCKS

are better!

BETTER—FASTER—MORE ECONOMICAL. Those four words tell the story of Yale Electric Industrial Trucks—and Yale Trucks apply those words to handling operations.

No matter what your handling problem, there's a money-saving Yale Truck for the job. The complete line includes low-lift and high-lift platform, fork, ram and crane models in capacities for every need.

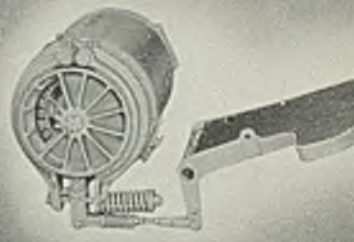
In addition, basic underlying features make Yale Trucks do superior work longer. Here are a few of them:

- 1. Drive Unit** . . . uses straight spur, or combination of bevel and spur gears. Gears are drop-forged, chrome-nickel, heat-treated steel for longer life. For smooth operation, they are mounted on roller bearings and move in an oil bath. Here's extra power 24 hours a day!
- 2. Cam-O-Tactor Controller** . . . Positive mechanical cam and roller action makes and breaks contacts, guards against welding of contact points. Permanent alloy blow-out magnets instantly quench arc—lengthen contactor life. This improved simplified controller is safer, trouble-free—means fewer costly repairs and lost hours.
- 3. Driving Brake** . . . mounted directly on motor end head, operates on a high-speed cast-iron drum and transmits the braking action to both driving wheels via a train of gears and differential. Regardless of operating conditions, it brakes the power at the source—gives operator the added safety of simultaneous braking on both drive wheels.
- 4. Drive Wheels** . . . are electrically welded disc steel type, mounted to the driving flange by specially hardened steel dowel bolts. Wheels can be easily demounted without exposing the sealed bearings or disturbing alignment. Servicing time reduced to a minimum!

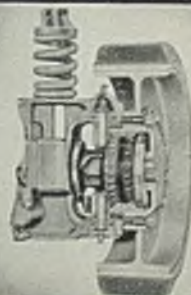
There is a Yale Electric Truck for your handling job. The Yale representative (listed in the Classified Directory) will be glad to tell you about it. Or write to us direct.



CAM-O-TACTOR CONTROLLER



DRIVING BRAKE



DRIVE WHEEL

THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
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Makers of Yale Hand Chain Hoists, Electric Hoists, Electric

more than 15 foot-candles of extraneous light present. Its applications include counting, sorting, weighing, measuring, controlling, signalling, inspecting and regulating when conditions permit. The relay has a controlled contact rating of 10 amperes at 115 volts alternating current, with two normally open and two normally closed contacts. The coil of the relay is energized when the light at the phototube is reduced below 30 foot-candles.

The unit may be mounted as a wall mounting on concealed rigid conduit, exposed rigid conduit, or with flexible conduit or open wiring;

bench or table mounting on rigid conduit, or with flexible conduit or open wiring.

The device has a removable bracket which can be secured to the supporting surface and the conduit before mounting the relay.

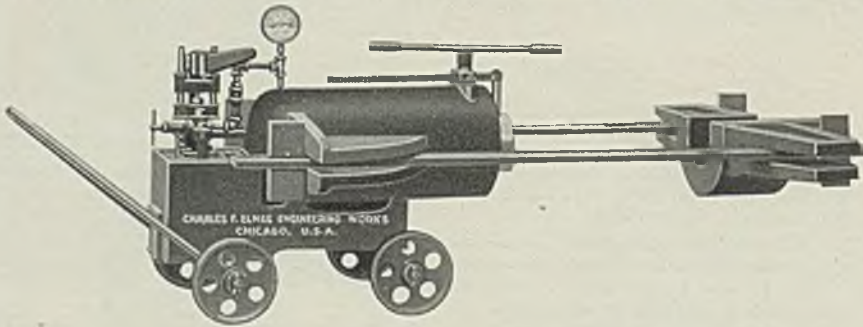
Power Sweeper

■ Ideal Power Lawn Mower Co., Lansing, Mich., announces a general purpose Roto power sweeper for large floor areas in industrial plants, docks, platforms, pavements, etc. It is capable of sweeping an average of 36,000 square feet per hour, and

works equally well on concrete, wood, tile, brick or asphalt. It picks up both light and heavy sweepings of dirt, dust, sand, gravel, iron filings, borings, cinders, paper and commercial sweeping compound. A sprinkler, regulated to keep the fiber bristles of the brush moist, prevents the raising of dust. Easy to operate, the sweeper is equipped with a power-driven rotary brush 14 inches in diameter. The brush turns in a counterclockwise direction to pick up the sweepings, carrying them up over a rubber deflector into the dirt box. Where the cleaning problem includes hard

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★ The Elmes Hydraulic Forging Press is available with vertical screw adjustments, with or without truck wheel mounting, or with crane hook attachment for portable service. Base frames may be set on wheels or permanently located. Cylinder and ram are mounted with rack and pinion reversing gear. Hand, Belt or Motor Pumps are optional.



grease, the sweeper can be equipped with a steel wire brush which cuts the grease and deposits it in the dirt box. It is furnished with straight or angle type brushes.

Belt Sander

■ Skilsaw Inc., 5033 Elston avenue, Chicago, announces a new lightweight 2¼-inch Zephyrplane Junior belt sander for light jobs. Among



its features are a die-cast aluminum frame, ball-bearing construction and a powerful universal motor. Other features of safety and convenience are a bakelite handle, a trigger switch and a patented "touch control" lever which permits quick changing of belts. The belt travels at a speed of 600 surface feet per minute, is kept uniformly

CHARLES F. ELMES ENGINEERING WORKS

243 N. MORGAN ST. *Chicago* . . . SINCE 1851 . . .

taut by a coil spring and can be easily centered by a simple adjustment. A variety of belts are obtainable adapting the tool for use on wood and metal, for removing varnish and for polishing. The sander weighs 9½ pounds.

Lift Truck

■ Barrett-Cravens Co., 3250 West Thirtieth street, Chicago, has placed on the market a model GX Light Boy multiple stroke lift truck which has a capacity of 2500 pounds. It



has a full lift of 3 inches accomplished with either four full or thirteen short strokes. Ball bearing wheels are standard equipment. The front wheels are wide-spread for stability. The truck is made in sizes ranging from 30 to 144 inches long in multiples of 6 inches, with either 6, 7, 9 or 11-inch diameter wheels; and in widths of 18 and 24 inches. A new model FX—the Pay Boy has the same general specifications, the same 3-inch lift but has a capacity of 3500 pounds. Both types of trucks have angle lift and a spring handle holdup.

Automatic Switchgear

■ Westinghouse Electric & Mfg. Co., Dept. 7-N-20, East Pittsburgh, Pa., announces an automatic switch-



gear for controlling one or more alternating current synchronous converters in mining service. It is used on 2300-volt alternating current 60-cycle service, with 275-volt direct current converter output.

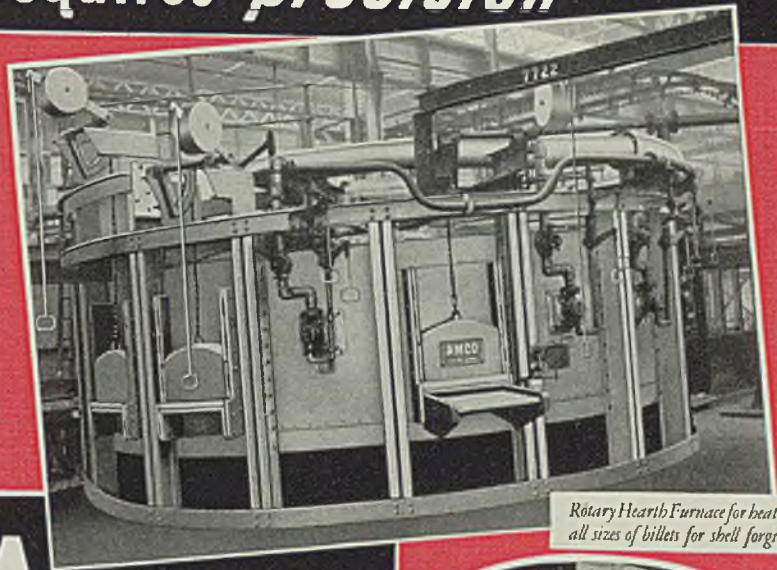
The switchgear is approximately 8 feet long and consists of high-tension equipment, alternating current starting and running panel, relay panel and a direct-current panel. All relays, meters, circuit breakers and auxiliaries are surface mounted on ebony asbestos panels. Starting and stopping sequences are entirely automatic, and protection is provided throughout all points of the operating cycle against abnormal conditions. The direct-current converter breaker may be used as a feeder breaker. For 2-unit stations, there is available a "load responsive" equipment which

provides for the automatic starting and stopping, in response to load demand of both units.

Welding Timer

■ Weltronic Corp., 2832 East Grand boulevard, Detroit, has placed on the market a model No. 79 welding timer of the electronic type which is capable of providing accurate timing control for the various operating sequences required for spot welding. In addition, it is designed to time nearly any combination of functions required in spot welding heavy sections within the scope of

Heating ordnance materials requires *precision*



Rotary Hearth Furnace for heating all sizes of billets for shell forgings

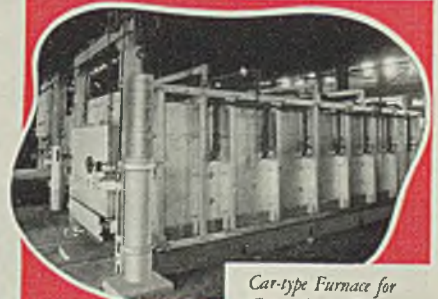
AMCO FURNACES

...have successfully met this vital need

The heating of shell and gun forgings calls for *uniform temperatures!* AMCO FURNACES are modern versions of *designs proved in actual service...* the acid test for such important operations. Write for details on the complete line of AMCO Furnaces, one of which will no doubt serve your particular purpose!



Gun Forging Furnace



Car-type Furnace for Guns, Armor Plate, etc.



The **AMSLER-MORTON COMPANY**
FULTON BUILDING • PITTSBURGH, PA.

the resistance forge welding process, and can be used with any equipment capable of handling such work—standard or special.

The automatic operation of the timer eliminates the necessity for a skilled operator.

It also is capable of timing any resistance forge welding operation which requires application of current nonsynchronously with the hammering.

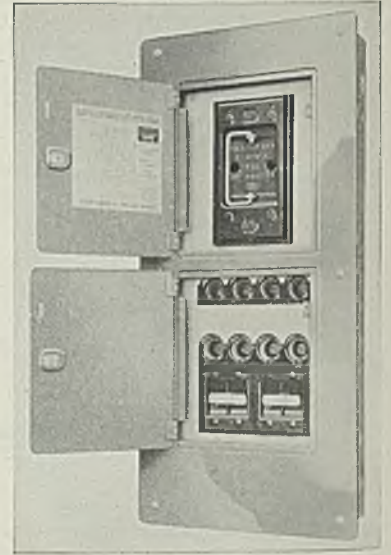
Eight control knobs permit the welding supervisor to "dial" for the proper intervals of pressure and welding current—the interruptions

of both—and for the proper cool time following completion of the actual welding. All operating elements—electronic tubes, relays, etc., are mounted on a panel and enclosed in a cabinet to permit mounting on either the welding machine or a separate stand conveniently located.

Pull-Out Control

■ Cutler-Hammer Inc., 315 North Twelfth street, Milwaukee, announces a new line of 100 ampere pull-out service control. It is avail-

able with or without branch circuits, the 100 ampere pull-out type being rated at 230 volts alternating current. It also is available with two 60 ampere pull-outs, and 4, 6, or 8-plug fuse circuits rated 115/250 volts. Among the features of the new bulletin 4336 are dead-front construction, bakelite switch base, 3-wire grounded solid neutral, new type solderless lugs on all 60 and 100-ampere terminals, easy-tight



wire holes on plug fuse circuit terminals, convenient fuse testing facilities and slots in cover and case for sealing purposes. The device is available in surface or flush mounting types. The former is finished in aluminum, and the latter type is finished in gray enamel.

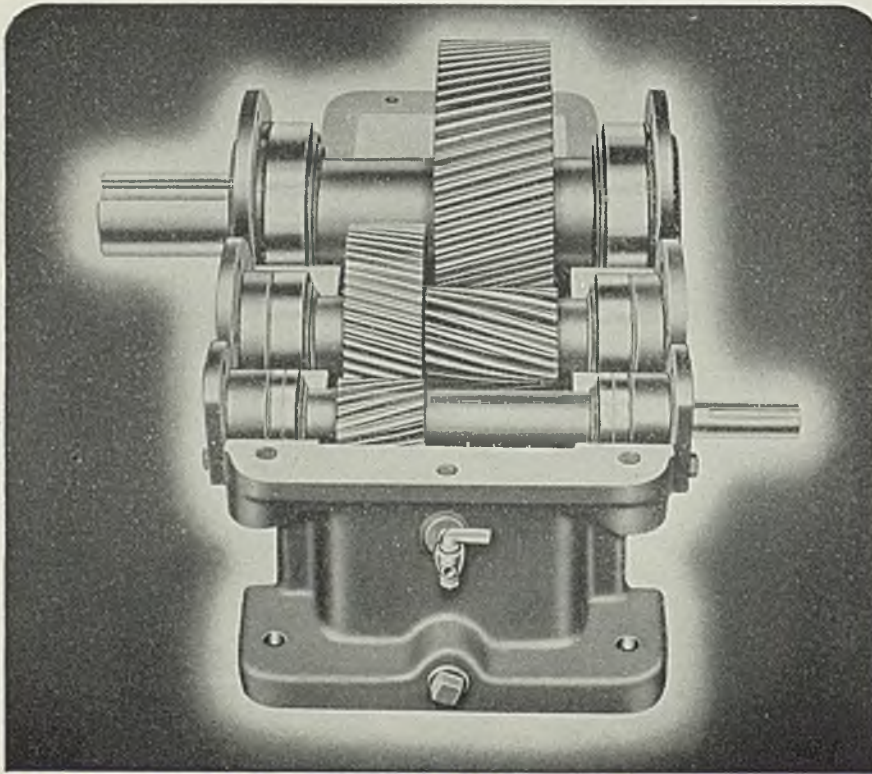
Level Control

■ Photoswitch Inc., 21 Chestnut street, Cambridge, Mass., has placed on the market type P30 electronic level control, an electronic relay for level control of both conductive and



nonconductive fluids and powders. It is available to meet all specifications including single level control, on and off control at two levels, boiler feedwater control and tank condensate signals. Installation merely entails attaching a probe

STEEL



MONEY-SAVING HELICAL REDUCERS

★ It's a two-way saving . . . in manufacturing because of the simplicity of design by Horsburgh & Scott engineers and . . . in maintenance and freedom from breakdowns because of the rugged and precision construction of every part from the finest materials. Investigate these H. & S. Helical Reducers with their lower first cost and longer trouble-free life.

Send note on Company Letterhead for Speed Reducer Catalog 39

THE HORSBURGH & SCOTT CO.

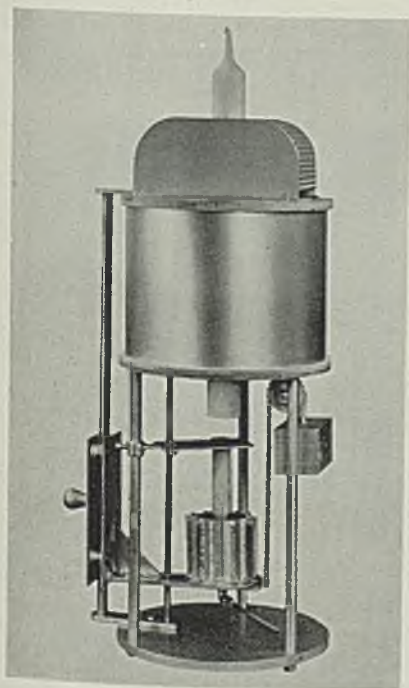
GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

fitting to the surface of the tank. For 2-level control, probe fittings or electrodes are attached to the tank at levels representing the low point where pumping starts and the high level where pumping stops. These are wired to the control. When the liquid level falls below the lower probe, the control closes the circuit which starts the pump, and the tank fills. When the level rises to the upper probe, the fluid itself acts as a conductor of the small amount of current required for the operation of the level control. This opens the pump control circuit. Even when used with nonconductive fluids the probe circuit carries only milliamperes of current and low voltage. This makes the control applicable to combustibles. It also is recommended in connection with all conductive fluids as well as such insulators as resin, rubber, latex, paraffin, mica, glass, cement, linseed oil, shellac, mineral oil, wax, waterglass, lacquer and thinner. Special tank fittings are available for use in corrosive liquids.

Combustion Furnace

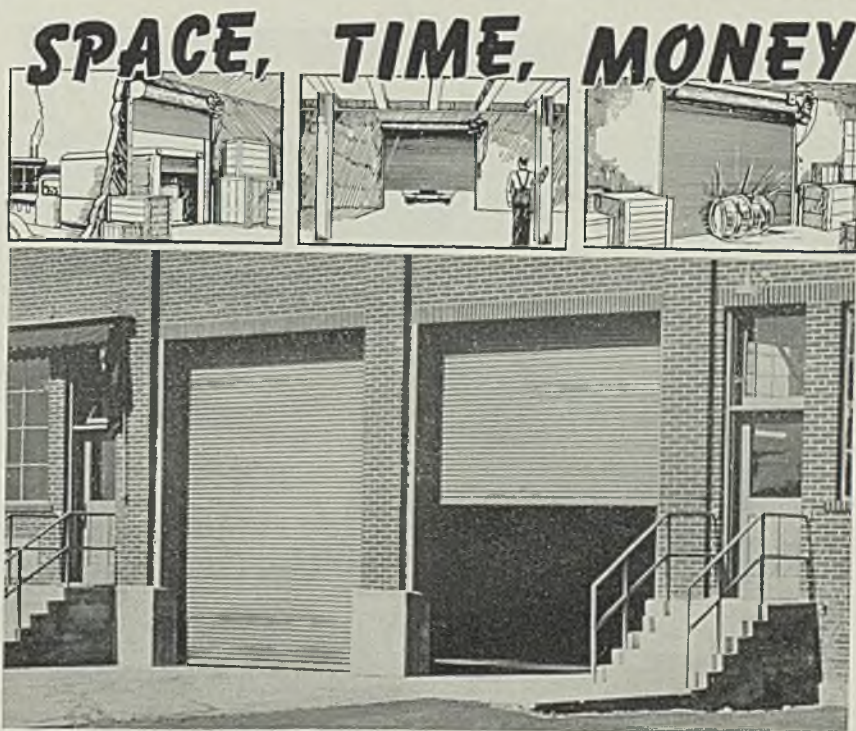
■ Hevi Duty Electric Co., 4212 West Highland boulevard, Milwaukee, has introduced a Sobers vertical combustion furnace for the determination of carbon in materials. It is



equipped with a steel shell enclosure, with top and bottom heads of asbestos board. Suitable insulation for high temperature operation surrounds a helical coil heating element, the strands of which are supported in strips of grooved refractories readily replaceable with the coil. The furnace may be operated continuously at 2300 degrees Fahr.

An elevator is provided in the unit for placing the sample in the heating zone of the combustion tube and withdrawing it after combustion is completed. It is hand-operated, and is self-locking in either the heating or reloading position. In the center of the elevator is a ceramic refractory pedestal which carries the sample in its container to the center of the heating zone of the combustion tube. The pedestal is capped with a nonoxidizing plate. The platform of the elevator has an annular trough holding mercury which seals the bottom end of the combustion tube when the sample is raised

to the heating position. The admission of oxygen through the combustion tube is controlled by a valve on the oxygen tank. Another feature is the protecting sleeve inside of the combustion tube. This is suspended from the top of the tube by a wire. By this same wire, the sleeve is adjustable to various levels. The furnace utilizes hand-made crucibles of common fire clay with 20 per cent silica sand. Besides carbon determination, it is readily adaptable for the heat treatment of small delicate parts, or for the determination of sulphur with properly selected absorption train.



YOU SAVE ALL THREE *with* KINNEAR ROLLING DOORS

Kinnear Rolling Doors save valuable floor and wall space by coiling out of the way above the opening

They save time, by opening quickly, smoothly and easily all year long—snow, ice or swollen ground can't get in their way. They save money, too.

Their rugged, durable, all-steel construction and interlocking-slat design mean longer lasting, carefree service.

When opened, they stay put—out of the way, out of reach of damage by wind or vehicles. They will not sag, warp, split or pull apart. They give extra protection against fire, are weatherproof, and present an all steel barrier against intruders and rioters.

Moreover, every Kinnear Rolling Door is especially built to fit the individual requirements. This reduces installation, operating and maintenance costs.

Kinnear Doors are built for any opening, in new or old buildings, with motor or manual control.

For all around door economy, you can depend on Kinnear's nationwide organization of specialists in door problems. Write for latest Kinnear catalog today!

THE KINNEAR MFG. CO.
1780-1800 FIELDS AVENUE
COLUMBUS, OHIO

KINNEAR

ROLLING DOORS

Flame Gouging Welds

(Concluded from Page 56)

the speed of the process is most apparent in deep gouging operations. Depending on the depth to which the deep gouging is carried, the speed increases from five times to ten times that of chipping.

Much slag adheres to the sides of the gouged groove. A hand cleaning hammer will displace this slag without any effort. Then the groove will be neat and clean, ready for welding.

A black oxide remains on the gouged surface but is thin and will not interfere with subsequent welding. It is of the same composition

that is found on oxyacetylene cuts made with the regular cutting torch. No one insists upon the removal of that oxide any more; no one should think the gouging oxide needs attention either.

Gouging allows greater freedom of design for welding where irregular shapes of heavy section are indicated. Here the forming operations may be completed before the component parts are assembled. Then the excess stock can be removed with the cutting torch and the pieces tacked together. The gouging torch will prepare the U groove from each side immediately before the welding. Where heavy or slightly alloyed sections must be

preheated before welding, the heat inherent in a heavy gouging operation proves to be ample.

Flame gouging has proved itself under average shop conditions. Speed and economy follow the successful application of the process. Just as with new shoes—it may need a little breaking in.

Announces Course on Aircraft Welding

■ A comprehensive course of exercises, covering the oxyacetylene welding process for the aviation industry is announced by Air Reduction Sales Co., 60 East Forty-second street, New York. Its purpose is to provide a well planned series of exercises, (67), to illustrate all the varied conditions existing in the art of aircraft welding. It also can be utilized to train operators who have had previous experience in other lines of oxyacetylene welding.

The book sells for 50 cents per copy and may be obtained by writing to the company.

Marked Shim Stock Facilitates Handling

■ Thin shim stock supplied in slotted cartons by Laminated Shim Co. Inc., Glenbrook, Conn., now is furnished marked plainly in inches on its edge—from 0 to 100 inches—with half-inch subdivisions through-



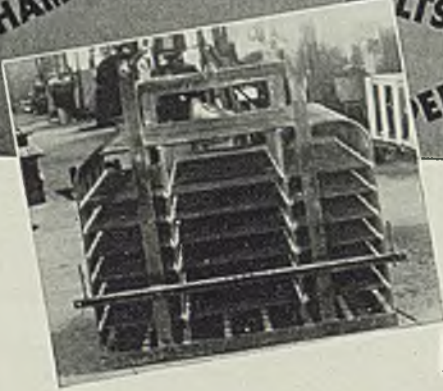
Cut fingers are avoided and handling is made easier by use of the marked shim stock illustrated

out the length. This allows it to be drawn through the carton slot and cut off to the exact size required.

Not only is waste avoided, but the markings also act as a signal, indicating when the roll is about used up. These packaged rolls of brass or steel shim stock (6 inches wide and available in 0.001 to 0.015-inch thicknesses) facilitate storage, prevent them from being mislaid and save time.

ACCEPTED COMBINATIONS

HAM & EGGS NUTS & BOLTS SALT & PEPPER P's & Q's
PEN & INK BREAD & BUTTER



... AND IN PICKLING CRATES

IT'S YOUNGSTOWN-AND-MONEL

Certain combinations work together with great success—and in pickling crates, it's YOUNGSTOWN-and-Monel. Monel is the outstanding metal for pickling equipment—resisting corrosion by sulfuric, hydrochloric, hydrofluoric acids, retaining its high strength and toughness for years, eliminating “copper flash” from pickled sheets.

When Monel's good qualities are incorporated in Youngstown welded crates, you've got the accepted standard for the foremost steel mills' pickling departments. Youngstown's engineers, welders and machinists design a crate for a particular job. Their welded construction means flexibility of design, more built-in strength with less weight. Thus payloads are increased, repair and maintenance bills minimized. Make sure that your pickling department will be able to meet efficiently and economically any demand made on it, today and in the future, with YOUNGSTOWN-and-Monel crates.

YOUNGSTOWN WELDING & ENGINEERING CO.
YOUNGSTOWN OHIO

ENGINEERING by YOUNGSTOWN
LONG LIFE by MONEL

Rising Prices Command

Industry's Attention

Six-furnace producer sells pig iron extensively \$1 higher. Steel extras, concrete bars for export, scrap higher.

■ PRICES command increasing attention following sales of merchant pig iron in several states by a producer with six blast furnaces. Whether other makers will follow this increase remains to be seen, but many consider the action as an indication other items may be raised in a few weeks. Scrap prices continue to advance moderately. On finished steel extras are being revised upwards, though so far in isolated instances, and consumers are often buying outside of home districts, paying freights, resulting in higher prices.

Reinforcing steel bars for export are \$4 per ton higher. More and more are premiums being offered for scarce raw materials. Yet strong efforts are being made, both by steelmakers and Washington, to keep prices at present levels, lest a spiraling process of rising raw materials, finished material selling prices and wages, get out of hand. In view of important price concessions until a few months ago steelmakers are actually obtaining substantially higher prices by merely adhering to lists.

Though majority of steel consumers co-operate with producers by buying conservatively, occasional extremes are noted, ranging from lack of ordinary foresight to attempts to buy three times apparent needs. Having experienced no delivery troubles in ten years steel users are not completely acclimated to the new order.

Steel ingot production last week declined one point to 95½ per cent of capacity, again revealing effects of the long strain on furnace linings.

Arrival of two cargoes of British coke, one at Baltimore and the other at Boston, is not as strange as might appear. The purpose is to furnish ballast for westbound ships and secure dollars for purchases of steel in the United States. The American coke supply becomes ever tighter, with the situation appearing more critical when severe winter weather interferes with shipments. Active beehive ovens at Connellsville number 5127, with only 300 more ovens which might be used after considerable work and expense.

Finished steel orders still come in faster than shipments, though the December volume is unchanged, to less, than in November. The usual year-end shrinkage of demand will be much less than usual. First quarter needs are bought up to about mid-February.

Prices of tin plate and terne plate have been reaffirmed for first quarter. Tin plate demand is less, as is normal for the month.

Automobile production in the week ended Dec. 14 amounted to 125,625 units, up 835 from the week before, compared with 118,405 a year ago.

Featuring recent railroad business were several sales to foreign countries. Brazil ordered 18,200 tons of rails and accessories from the United States Steel Export Co. and 458 freight cars, the bulk from Pullman-Standard Car Mfg. Co. and some from the American Car & Foundry Export Co. The Soviet government ordered ten electric switch engines from the General Electric Co. Domestic rail orders for the week totaled 22,320 tons for three carriers.

To get prompter delivery on plates some consumers are buying from remote districts and paying the higher freights. Thus though prices paid are above the usual markets they get four weeks' delivery instead of the usual eight to ten. Plate makers and shipbuilders are highly interested in proposals to concentrate more shipbuilding on the Great Lakes for strategic reasons. Among plans proposed is building ships in halves and assembling nearer the ocean; or, the much discussed project of making the St. Lawrence navigable for all ocean-going vessels.

Sales of fabricated structural steel were around 33,000 tons last week which compares with a weekly average this year of 28,000 tons. Sales of reinforcing bars were around 5250 tons as against an average of nearly 10,000 tons. The largest structural inquiry in many weeks involves 23,000 tons for an extension of the Fore river shipyard, Quincy, Mass.

Declines in operating rates were reported by districts as follows: Birmingham, 3 points to 97 per cent, Pittsburgh 1 point to 96, Cleveland 4 points to 86½ and Chicago 1½ points to 98. New England gained 15 points to 90 per cent. Remaining unchanged were Cincinnati at 87, St. Louis at 87½, Detroit at 90, Buffalo at 93, Wheeling at 98½, Eastern Pennsylvania at 95 and Youngstown at 92.

STEEL'S steelworks scrap composite gained 8 cents to \$21.37; a slight upward adjustment brought iron and steel to \$38.28; finished steel was unchanged at \$56.60.

MARKET IN TABLOID ★

Demand

Continues brisk

Prices

Pig iron, scrap up.

Production

Down 1 point to 95½.

Buffalo	2.15c
Birmingham	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.80c

Iron

Chicago	2.25c
Philadelphia, del.	2.37c
Pittsburgh, refined	3.50-8.00c
Terre Haute, Ind.	2.15c

Reinforcing

New Billet Bars, Base	
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Rail Steel Bars, Base

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads	
Standard and cement coated wire nails	\$2.55

(Per Pound)

Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c

Woven wire fencing (base C. L. column)	
Single loop bale ties, (base C.L. column)	67
Galv. barbed wire, 80-rod spools, base column	70
Twisted barbless wire, column	70

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago Birmingham (except spring wire)	
Bright bess., basic wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Worcester, Mass., \$2 higher on bright basic and spring wire.	

Cut Nails

Carload, Pittsburgh, keg.	\$3.85
---------------------------	--------

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

Alloy Bars (Hot)

(Base, 20 tons or over)	
Pittsburgh, Buffalo, Chi., cago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

	Alloy	Alloy	
S.A.E. Diff.	S.A.E. Diff.		
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.70	3300	3.80
2500	2.55	3400	3.20
4100 0.15 to 0.25 Mo.	0.55		
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.20		
5100 0.80-1.10 Cr.	0.45		
5100 Cr. spring flats	0.15		
6100 bars	1.20		
6100 spring flats	0.85		
Cr. N., Van.	1.50		
Carbon Van.	0.85		
9200 spring flats	0.15		
9200 spring rounds, squares	0.40		
Electric furnace up 50 cents.			

Alloy Plates (Hot)

Pittsburgh, Chicago, Coatesville, Pa.	3.50c
---------------------------------------	-------

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast ports	2.75c

Cooperage hoop, Young., Pitts.; Chicago, Birm.

2.20c

Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown

Chicago	2.80c
Detroit, del.	2.90c
Worcester, Mass.	2.90c
Carbon	3.00c
0.26-0.50	2.80c
0.51-0.75	4.30c
0.76-1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. \$4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	\$40.00
Relay rails, Pittsburgh 20-100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	\$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c
Base, light rails 25 to 60 lbs., 20 lbs., up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base plates 20 tons.	

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

1/2 x 6 and smaller	68 off
Do., 3/4 and 1/2 x 6-in. and shorter	66 off
Do., 3/4 to 1 x 6-in. and shorter	64 off
1 1/2 and larger, all lengths	62 off
All diameters, over 6-in. long	62 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate	
72.5-10 off; with nuts attached	
72.5 off; bulk 82 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.	
Step bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex. U.S.S.	S.A.E.
1/2-inch and less	66 70
3/8-1-inch	63 65
1 1/2-1 1/2-inch	61 62
1 1/2 and larger	60

Hexagon Cap Screws

Upset 1-in., smaller 70.0 off

Square Head Set Screws

Upset, 1-in., smaller 75.0 off
Headless set screws 64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
------------------------	-------

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.

Structural	3.40c
3/4-inch and under	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers	
and large nut. bolt	
mfrs. l.c.l.	\$5.40; c.l. \$5.75 off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitt. Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 1/2 and 1 1/2 less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel

In.	Blk.	Galv.
1/2	63 1/2	54
3/4	66 1/2	58
1-3	68 1/2	60 1/2
Iron		
1-3/4	30	13
1 1/2	34	19
1 1/4	38	21 1/2
2	37 1/2	21

Lap Weld Steel

2	61	52 1/2
2 1/2-3	64	55 1/2
3 1/2-6	66	57 1/2
7 and 8	65	55 1/2

Iron

2	30 1/2	15
2 1/2-3 1/4	31 1/2	17 1/2
4	33 1/2	21
4 1/2-8	32 1/2	20
9-12	28 1/2	15

Line Pipe Steel

1 to 3, butt weld	67 1/2
2, lap weld	60
2 1/2 to 3, lap weld	63
3 1/2 to 6, lap weld	65
7 and 8, lap weld	64

Blk. Galv.

1/2 butt weld	25	7
1 and 1 1/2 butt weld	29	13
1 1/2 butt weld	33	15 1/2
2 butt weld	32 1/2	15
1 1/2 lap weld	23 1/2	7
2 lap weld	25 1/2	9
2 1/2 to 3 1/2 lap weld	26 1/2	11 1/2
4 lap weld	28 1/2	15
4 1/2 to 8 lap weld	27 1/2	14
9 to 12 lap weld	23 1/2	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut-lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

	Sizes	Gage	Steel	Charcoal
1 1/4" O.D.	13	\$ 9.72	\$23.71	
1 1/2" O.D.	13	11.06	22.93	
2" O.D.	13	12.38	19.35	
2 1/4" O.D.	13	13.79	21.68	
2 1/2" O.D.	12	15.16		
2 3/4" O.D.	12	16.58	26.57	
3" O.D.	12	17.54	29.00	
3 1/2" O.D.	12	18.35	31.36	
4" O.D.	11	23.15	39.81	
4 1/2" O.D.	10	28.66	49.90	
5" O.D.	9	44.25	73.93	
5 1/2" O.D.	7	68.14		

Seamless

	Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	\$ 7.82	\$ 9.01	
1 1/4" O.D.	13	9.26	10.67	
1 1/2" O.D.	13	10.23	11.79	
1 3/4" O.D.	13	11.64	13.42	

2" O.D.	13	13.04	15.03
2 1/4" O.D.	13	14.54	16.76
2 1/2" O.D.	12	16.01	18.45
2 3/4" O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 1/2" O.D.	12	19.50	22.48
4" O.D.	11	24.62	28.37
4 1/2" O.D.	10	30.54	35.20
5" O.D.	10	37.35	43.04
5 1/2" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Pet Net Ton
6-in., & over, Birm. \$45.00-46.00
4-in., Birmingham... 48.00-49.00
4-in., Chicago... 56.80-57.80
6-in. & over, Chicago 53.80-54.80
6-in. & over, east fdy. 49.00
Do., 4-in. 52.00
Class A Pipe \$3 over Class B
Std. Atgs., Birm., base \$100.00.

Semifinished Steel

Rerolling Billets, Slabs (Gross Tons)	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00
Forging Quality Billets	
Pitts., Chi., Gary, Cleve., Young, Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Youngs., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to 3/8-inch incl. (per 100 lbs.)	\$2.00
Do., over 3/8 to 1 1/2-in. incl.	2.15
Worcester up \$0.10; Galveston up \$0.25; Pacific Coast up \$0.50.	

Skelp	
Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, fur.	\$4.75- 5.00
Connellsville, fdry.	5.25- 6.00
Connell, prem. fdry.	6.00- 6.50
New River fdry.	6.50- 7.00
Wise county fdry	5.50- 6.50
Wise county fur.	5.00- 5.25

By-Product Foundry

Newark, N. J., del.	11.85-12.30
Chicago, outside del.	11.00
Chicago, delivered	11.75
Terre Haute, del.	11.25
Milwaukee, ovens.	11.75
New England, del.	12.50
St Louis, del.	11.75
Birmingham, ovens.	7.50
Indianapolis, del.	11.25
Cincinnati, del.	11.00
Cleveland, del.	11.55
Buffalo, del.	11.75
Detroit, del.	11.50
Philadelphia, del.	11.63

Coke By-Products

Spot, gal., freight allowed east of Omaha	
Pure and 90% benzol	14.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c
Per lb. f.o.b. Frankford and St. Louis	
Phenol (less than 1000 lbs.)	13.75c
Do. (1000 lbs. or over)	12.75c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	7.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	\$29.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	\$24.00	\$24.50	\$23.50	\$25.00
Birmingham, Ala.	19.38	.....	18.38	24.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	23.00	23.00	22.50	23.50

†Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	.....	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	.....	.....	.....	.....
Saginaw, Mich., from Detroit	25.31	25.31	24.81	25.81
St. Louis, northern	23.50	23.50	23.00	.....

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	†23.12	.....	22.62	.....
St. Paul from Duluth	25.63	25.63	.....	26.13

†Over 0.70 phos.

Low Phos.
Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., \$28.50, base; \$29.74 delivered Philadelphia.

Gray Forge	Charcoal	
Valley furnace	Lake Superior fur.	\$27.00
Pitts. dist. fur.	do., del. Chicago	30.34
	Lyles, Tenn.	26.50

†Silvery
Jackson county, O., base; 6-6.50 per cent \$28.50; 6.51-7—\$29.00; 7-7.50—\$29.50; 7.51-8—\$30.00; 8-8.50—\$30.50; 8.51-9—\$31.00; 9-9.50—\$31.50; Buffalo, \$1.25 higher.

Bessemer Ferrosilicon†
Jackson county, O., base; Prices are the same as for silveries, plus \$1 a ton.
†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.
Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, \$1 per ton add. Each unit over 3%, add \$1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices	Ladle Brick (Pa., O., W. Va., Mo.)
Fire Clay Brick	Dry press..... \$28.00
Super Quality	Wire cut..... 26.00
Pa., Mo., Ky..... \$60.80	Magnesite
First Quality	Domestic dead-burned grains, net ton f.o.b.
Pa., Ill., Md., Mo., Ky.... 47.50	Chewelah, Wash., net ton, bulk..... 22.00
Alabama, Georgia..... 47.50	net ton, bags..... 26.00
New Jersey..... 52.50	Basic Brick
Second Quality	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.
Pa., Ill., Ky., Md., Mo.... 42.75	Chrome brick..... \$50.00
Georgia, Alabama..... 34.20	Chem. bonded chrome.... 50.00
New Jersey..... 49.00	Magnesite brick..... 72.00
Ohio	Chem. bonded magnesite 61.00
First quality..... 39.90	
Intermediate..... 36.10	
Second quality..... 31.35	
Malleable Bung Brick	Fluorspar
All bases..... \$56.05	Washed gravel, duty pd., tide, net ton. \$25.00-\$26.00
Silica Brick	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail. 20.00-21.00
Pennsylvania..... \$47.50	Do. barge..... 20.00
Joliet, E. Chicago..... 55.10	No. 2 lump..... 20.00-21.00
Birmingham, Ala. 47.50	

Ferroalloy Prices

Ferromanganese, 78-82%, carlots, duty pd. \$120.00	Do., ton lots..... 11.75c	Do., spot..... 145.00	Silicon Metal, 1% iron, contract, carlots, 2 x 1/4-in., lb. 14.50c
Ton lots 130.00	Do., less-ton lots..... 12.00c	Do., contract, ton lots..... 145.00	Do., 2%, Spot 1/2c higher..... 13.00c
Less ton lots 133.50	less than 200 lb. lots..... 12.25c	Do., spot, ton lots..... 150.00	
Less 200 lb. lots 138.00	67-72% low carbon:	15-18% ti., 3-5% carbon, carlots, contr., net ton..... 157.50	Silicon Briquets, contract carloads, bulk, freight allowed, ton \$74.50
Do., carlots del. Pitts. 125.33	Car-loads loads tons ton	Do., spot..... 160.00	Ton lots..... 84.50
Spiegelstein, 19-21% dom. Palmerton, Pa., spot 36.00	2% carb.... 17.50c 18.25c 18.75c	Do., contract, ton lots..... 160.00	Less-ton lots, lb..... 4.66c
Do., 26-28% 49.50	1% carb.... 18.50c 19.25c 19.75c	Do., spot, ton lots..... 165.00	Less 200 lb. lots, lb..... 4.25c
Ferrosilicon, 50%, freight allowed, c.l. 74.50	0.10% carb. 20.50c 21.25c 21.75c	Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c	Spot 1/2-cent higher.....
Do., ton lot 87.00	0.20% carb. 19.50c 20.25c 20.75c	Do., ton lots..... 8.00c	Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.50c
Do., 75 per cent 135.00	Spot 1/2c higher.....	Do., less-ton lots..... 8.50c	Ton lots..... 6.00c
Do., ton lots 151.00	Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95	Spot 1/2c lb. higher.....	Less-ton lots..... 6.25c
Spot, \$5 a ton higher.	Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80	Chromium Briquets, contract, freight allowed, lb. carlots, bulk 7.00c	Spot 1/2c higher.....
Silicomanganese, c.l., 3 per cent carbon 113.00	Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots \$1.23	Do., ton lots..... 7.50c	Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton 102.50
2 1/2% carbon 118.00	Do., less-ton lots..... 1.25	Do., less-ton lots..... 7.75c	Do., ton..... 108.00
2% carbon, 123.00; 1%, 133.00	20-25% carbon, 0.10 max., ton lots, lb..... 1.35	Do., less 200 lbs..... 8.00c	35-40%, contract, carloads, lb., alloy..... 14.00c
Contract ton price \$12.50 higher; spot \$5 over contract.	Do., less-ton lots..... 1.40	Spot, 1/2c higher.....	Do., ton lots..... 15.00c
Ferrotungsten, stand., lb. con. del. cars 1.90-2.00	Spot 5c higher.....	Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. \$2.50	Do., less-ton lots..... 16.00c
Ferrovandium, 35 to 40%, lb., cont. 2.70-2.80-2.90	Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls \$2.25	Do., smaller lots..... 2.60	Spot 1/2c higher.....
Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric furn., per ton, c. i., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage 75.00	Do., less-ton lots..... 2.30	Vanadium Pentoxide, contract, lb. contained \$1.10	Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. 2.75
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 11.00c	Spot is 10c higher.....	Do., spot..... 1.15	Do., 100-200 lb. lots..... 3.00
	Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80	Chromium Metal, 98% cr., contract, lb. con. chrome, ton lots 80.00c	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c
	Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton \$142.50	Do., spot..... 85.00c	
		88% chrome, cont. tons..... 79.00c	
		Do., spot..... 84.00c	

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
							Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	S.A.E. 2300	S.A.E. 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.86	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.80	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.25	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.05	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.62	3.62	3.62	3.40	5.25	3.05	4.30	4.40	3.22	3.75	8.40	6.75
Pittsburgh	3.35	3.40	3.40	3.40	3.40	5.00	3.15	....	4.45	....	3.65	8.40	6.75
Cleveland	3.25	3.30	3.30	3.40	3.58	5.18	3.15	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.23	4.30	4.64	3.20	3.80	8.70	7.05
Omaha	3.90	3.80	3.80	3.95	3.95	5.55	3.45	....	5.00	....	4.42	....	....
Cincinnati	3.60	3.47	3.47	3.65	3.68	5.28	3.22	4.00	4.67	3.47	4.00	8.75	7.10
Chicago	3.50	3.40	3.40	3.55	3.55	5.15	3.05	4.10	4.60	3.30	3.75	8.40	6.75
Twin Cities	3.75	3.65	3.65	3.80	3.80	5.40	3.30	4.35	4.75	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.58
St. Louis	3.62	3.52	3.52	3.47	3.47	5.07	3.18	4.12	4.87	3.41	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Indianapolis	3.60	3.55	3.55	3.70	3.70	5.30	3.25	....	4.76	....	3.97	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.68	3.70	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.33	4.33	5.93	3.99	....	5.71	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.88	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	3.50	5.95	5.95	3.85	3.85	5.50	4.20	....	5.25	....	6.60	....	....
Seattle	4.00	3.85	5.20	3.65	3.75	5.75	3.70	6.50	5.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.60	6.45	4.15	4.15	6.40	4.30	6.50	5.25	....	6.60	10.55	9.80
San Francisco	3.50	4.00	6.00	3.50	3.50	5.60	3.40	6.40	5.15	....	6.80	10.65	9.80

	S.A.E. Hot-rolled Bars (Unannealed)				
	1035-1050 Series	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars; Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Oreg.; any quantity in Twin Cities; 300-1999 in Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-4999 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 1500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Official Rates of Exchange

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	Continental Channel or North Sea ports, gross tons		Quoted in dollars at current value		**Quoted in gold pounds sterling	
	British gross tons U. K. ports	£ s d	£ s d	£ s d	£ s d	£ s d
Foundry, 2.50-3.00 Sl.	....	....	33.23	....	3 18 0	....
Basic bessemer	....	....	....	....	....	....
Hematite, Phos. .03-.05	....	....	....	....	....	....
Billets	....	....	31.95	....	3 15 0	....
Wire rods, No. 5 gage	....	....	60.71	....	7 2 6	....
Standard rails	....	....	48.99	....	5 15 0	....
Merchant bars	2.97c 16 10 0	....	2.77c	....	7 6 0	....
Structural shapes	2.79c 15 10 0	....	2.53c	....	7 9 0	....
Plates, ¼ in. or 5 mm	3.04c 16 17 6	....	3.53c	....	9 6 0	....
Sheets, black, 24 gage or 0.5 m m.	4.01c 22 5 0	....	2.98c	....	7 17 0	°
Sheets, gal., 24 ga., corr.	4.61c 25 12 6	....	3.94c	....	10 7 6	....
Bands and strips	....	....	2.76c	....	7 5 0	....
Plain wire, base	....	....	3.15c	....	8 6 3	....
Galvanized wire, base	....	....	3.75c	....	9 17 6	....
Wire nails, base	....	....	3.56c	....	9 7 6	....
The plate, box 108 lbs.	\$ 6 33	1 11 4	....	....	....	....

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French		Belgian		Reich	
	£ s d	£ s d	!!Francs	!!Francs	!!Francs	!!Francs	!!Mark	!!Mark
Fdy. pig iron, Sl. 2.5	\$25.86	6 8 0(a)	\$17.18	786	\$31.44	950	\$25.33	63
Basic bess. pig iron	24.34	6 0 6(a)	....	....	29.79	900	27.94	(b) 69.50
Furnace coke	7.27	1 15 11	4.91	225	10.92	320	7.64	19
Billets	49.49	12 5 0	26.02	1,221	42.20	1,275	38.79	96
Standard rails	2.61c	14 10 6	1.69c	1,692	2.06c	1,375	2.38c	132
Merchant bars	3.17c	17 12 0††	1.53c	1,530	2.06c	1,375	1.98c	110
Structural shapes	2.77c	15 8 0††	1.49c	1,487	2.06c	1,375	1.93c	107
Plates, ¼-in. or 5 mm.	2.91c	16 3 0††	1.95c	1,951	2.42c	1,610	2.29c	127
Sheets, black	4.10c	22 15 0‡	2.30c	2,295‡	2.85c	1,900‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.70c	26 2 6	3.59c	3,589	4.80c	3,200	6.66c	370
Plain wire	4.28c	23 15 0	2.34c	2,340	3.00c	2,000	3.11c	173
Rands and strips	3.30c	18 7 0††	1.71c	1,713	2.48c	1,650	2.29c	127

†British ship-plates. Continental, bridge plates. ‡24 ga. †† to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. 5% rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15% on certain conditions. **Gold pound sterling not quoted. ††No quotation.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	19.00
Bos. dock No. 1 exp.	17.00
New Eng. del. No. 1	17.00-17.50
Buffalo, No. 1	21.50-22.00
Buffalo, No. 2	19.50-20.00
Chicago, No. 1	20.50-21.00
Chicago, auto, no alloy	19.50-20.00
Cincinnati, dealers	18.50-19.00
Cleveland, No. 1	21.50-22.00
Cleveland, No. 2	20.50-21.00
Detroit, No. 1	†16.50-17.00
Detroit, No. 2	†15.50-16.00
Eastern Pa., No. 1	20.50-21.00
Eastern Pa., No. 2	19.50-20.00
Federal, Ill., No. 2	17.50-18.00
Granite City, R. R. No. 1	17.25-18.00
Granite City, No. 2	17.50-18.00
Los Ang., No. 1 net	12.50-13.00
Los Ang., No. 2 net	11.50-13.00
N. Y. dock No. 1 exp.	†17.00
Pitts., No. 1 (R. R.)	23.50-24.00
Pittsburgh, No. 1	22.50-23.00
Pittsburgh, No. 2	20.50-21.00
St. Louis, No. 1	18.25-19.00
St. Louis, No. 2	17.25-18.00
San Fran., No. 1 net	13.00-13.50
San Fran., No. 2 net	12.00-12.50
Seattle, No. 1	15.00
Toronto, dirs., No. 1	11.00-11.25
Valleys, No. 1	22.50-23.00

COMPRESSED SHEETS

Buffalo	19.50-20.00
Chicago, factory	20.00-20.50
Chicago, dealers	18.50-19.00
Cincinnati, dealers	18.00-18.50
Cleveland	21.00-21.50
Detroit	†18.25-18.75
E. Pa., new mat.	21.00
E. Pa., old mat.	17.50-18.00
Los Angeles, net	9.25-9.75
Pittsburgh	22.50-23.00
St. Louis	15.25-15.75
San Francisco, net.	9.50-10.00
Valleys	21.00-21.50

BUNDLED SHEETS

Buffalo, No. 1	19.50-20.00
Buffalo, No. 2	18.00-18.50
Cleveland	16.00-16.50
Pittsburgh	21.00-21.50
St. Louis	13.75-14.25
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	15.50-16.00
Cincinnati, dealers	13.00-13.50
Detroit	†14.50-15.00
St. Louis	13.25-13.75
Toronto, dealers	9.00

BUSHELING

Birmingham, No. 1.	17.00
Buffalo, No. 1	19.50-20.00
Chicago, No. 1	19.50-20.00
Cincin., No. 1 deal.	14.50-15.00
Cincin., No. 2 deal.	8.00-8.50
Cleveland, No. 2	14.50-15.00
Detroit, No. 1 new	†17.50-18.00
Valleys, new, No. 1	21.50-22.00
Toronto, dealers	9.50-10.00

MACHINE TURNINGS (Long)

Birmingham	8.50
Buffalo	14.00-14.50

Chicago	15.00-15.50
Cincinnati, dealers	10.50-11.00
Cleveland, no alloy	13.50-14.00
Detroit	†10.25-10.75
Eastern Pa.	15.00
Los Angeles	4.00-5.00
New York	†10.00-10.50
Pittsburgh	16.00-16.50
St. Louis	11.50-12.00
San Francisco	5.00
Toronto, dealers	7.25-7.50
Valleys	14.50-15.00

SHOVELING TURNINGS

Buffalo	15.00-15.50
Cleveland	15.00-15.50
Chicago	14.75-15.25
Chicago, spl, anal.	15.50-16.00
Detroit	†12.25-12.75
Pitts., alloy-free	17.00-17.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†8.50-9.00
Buffalo	14.00-14.50
Cincinnati, dealers	10.00-10.50
Cleveland	15.00-15.50
Eastern Pa.	13.50-14.00
Detroit	†11.50-12.00
New York	†9.00-9.50
Pittsburgh	15.50-16.00
Toronto, dealers	7.00-7.25

AXLE TURNINGS

Buffalo	17.00-17.50
Boston district	†12.50-13.00
Chicago, elec. fur.	20.50-21.00
East. Pa. elec. fur.	19.50-20.00
St. Louis	14.00-14.50
Toronto	7.25-7.50

CAST IRON BORINGS

Birmingham	8.50
Boston dist. chem.	†9.75-10.00
Buffalo	14.00-14.50
Chicago	14.00-14.50
Cincinnati, dealers	10.00-10.50
Cleveland	14.50-15.00
Detroit	†11.75-12.25
E. Pa., chemical	15.00-15.50
New York	†10.50-11.00
St. Louis	11.25-11.75
Toronto, dealers	7.25-7.50

RAILROAD SPECIALTIES

Chicago	23.50-24.00
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ANGLE BARS—STEEL

Chicago	23.50-24.00
St. Louis	22.00-22.50

SPRINGS

Buffalo	25.50-26.00
Chicago, coil	24.50-25.00
Chicago, leaf	23.50-24.00
Eastern Pa.	25.00-26.00
Pittsburgh	27.50-28.00
St. Louis	23.25-23.75

STEEL RAILS, SHORT

Birmingham	21.00
Buffalo	25.50-26.00
Chicago (3 ft.)	24.00-24.50
Chicago (2 ft.)	25.00-25.50
Cincinnati, dealers	26.00-26.50
Detroit	†23.00-23.50
Pitts., 2 ft. and less	27.00-27.50
St. L. 2 ft. & less.	24.25-24.75

STEEL RAILS, SCRAP

Birmingham	19.00
Boston district	†16.50-17.50

Buffalo	22.50-23.00
Chicago	20.50-21.00
Cleveland	25.00-25.50
Pittsburgh	24.00-24.50
St. Louis	21.50-22.00
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net	14.50-15.00
Cincinnati, dealers	13.50-14.00

RAILROAD GRATE BARS

Buffalo	14.50-15.00
Chicago, net	14.00-14.50
Cincinnati, dealers	13.00-13.50
Eastern Pa.	18.50-19.00
New York	†13.00-13.50
St. Louis	15.00-15.50

RAILROAD WROUGHT

Birmingham	17.00
Boston district	†9.50-10.00
Eastern Pa., No. 1	20.00-20.50
St. Louis, No. 1	15.25-15.75
St. Louis, No. 2	17.25-18.00

FORGE FLASHINGS

Boston district	†13.75-14.00
Buffalo	19.50-20.00
Cleveland	19.00-19.50
Detroit	†16.75-17.25
Pittsburgh	21.00-21.50

FORGE SCRAP

Boston district	†12.75-13.00
Chicago, heavy	24.50-25.00

LOW PHOSPHORUS

Cleveland, crops	27.00-27.50
Eastern Pa., crops	25.00-25.50
Pitts., billet, bloom, slab crops	28.00-28.50

LOW PHOS. PUNCHINGS

Buffalo	25.00-25.50
Chicago	23.50-24.00
Cleveland	23.00-23.50
Eastern Pa.	25.00-25.50
Pittsburgh	27.00-27.50
Seattle	15.00
Detroit	†20.00-20.50

RAILS FOR ROLLING

5 feet and over

Birmingham	20.00
Boston	†18.50-19.00
Chicago	24.75-25.25
New York	†19.00-19.50
Eastern Pa.	25.00-26.00
St. Louis	24.50-25.00

STEEL CAR AXLES

Birmingham	19.00
Boston district	†19.75-20.00
Chicago, net	25.50-26.00
Eastern Pa.	25.00-25.50
St. Louis	25.25-25.75

LOCOMOTIVE TIRES

Chicago (cut)	24.00-24.50
St. Louis, No. 1	21.75-22.25

SHAFTING

Boston district	†19.75-20.00
New York	†20.00-20.50

Eastern Pa.	25.00-25.50
St. Louis, 1 1/4-3 1/4"	20.00-20.50

CAR WHEELS

Birmingham, iron	20.00
Boston dist., iron	†16.00-16.50
Buffalo, steel	25.50-26.00
Chicago, iron	21.50-22.00
Chicago, rolled steel	24.00-24.50
Cincin., iron deal.	20.50-21.00
Eastern Pa., iron	22.50-23.00
Eastern Pa., steel	25.50-26.00
Pittsburgh, iron	22.50-23.00
Pittsburgh, steel	27.50-28.00
St. Louis, iron	21.00-21.50
St. Louis, steel	23.00-23.50

NO. 1 CAST SCRAP

Birmingham	18.50
Boston, No. 1 mach.	†17.50-18.00
N. Eng., del. No. 2	17.50-18.00
N. Eng. del. textile	21.50-22.00
Buffalo, cupola	19.00-19.50
Buffalo, mach.	20.00-20.50
Chicago, agri. net.	16.50-17.00
Chicago, auto net.	18.25-18.75
Chicago, rail'd net	17.75-18.25
Chicago, mach. net.	18.75-19.25
Cincin., mach. deal.	22.00-22.50
Cleveland, mach.	24.00-24.50
Detroit, cupola, net.	†16.75-17.25
Eastern Pa., cupola	23.00-23.50
E. Pa., No. 2	20.00
E. Pa., yard fdry.	20.00
Los Angeles	16.50-17.00
Pittsburgh, cupola	22.00-22.50
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	19.75-20.25
St. L., No. 1 mach.	21.00-21.50
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break	†16.00-16.25
New England, del.	17.00-17.50
Buffalo, break	18.00-18.50
Cleveland, break, net	17.00-17.50
Detroit, auto net.	†17.00-17.50
Detroit, break	†14.75-15.25
Eastern Pa.	21.50-22.00
Los Ang., auto, net.	13.00-14.00
New York break	†16.00-16.50

STOVE PLATE

Birmingham	12.00-13.00
Boston district	†13.50-14.00
Buffalo	17.00-17.50
Chicago, net	13.25-13.75
Cincinnati, dealers	14.00-14.50
Detroit, net	†11.50-12.00
Eastern Pa.	18.50-19.00
New York fdry.	†14.25-14.50
St. Louis	15.00-15.50
Toronto dealers, net	12.00

MALLEABLE

New England, del.	22.00-23.00
Buffalo	23.50-24.00
Chicago, R. R.	24.25-24.75
Cincin. agri., deal.	19.00-19.50
Cleveland, rail	25.00-25.50
Eastern Pa., R. R.	22.50-23.00
Los Angeles	12.50
Pittsburgh, rail	26.00-26.50
St. Louis, R. R.	22.00-22.50

Ores

Lake Superior Iron Ore	
Gross ton, 51 1/2 %	
Lower Lake Ports	
Old range bessemer	\$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60
Eastern Local Ore	
Cents, unit, del. E. Pa.	
Foundry and basic	
56-63%, contract.	10.00
Foreign Ore	
Cents per unit, c.i.f. Atlantic ports	
Manganiferous ore,	
45-55% Fe., 6-10%	
Mang.	Nom.
N. African low phos	nom.

Spanish, No. African	
basic, 50 to 60%	nom.
Chinese wolframite,	
net ton, duty pd.	\$23.50-24.00
Brazil iron ore, 68-	
69%, ord.	7.50c
Low phos. (.02	
max.)	8.00c
F.O.B. Rio Janeiro.	
Scheelite, imp.	\$25.00
Chrome ore, Indian,	
48% gross ton, cif.	\$28.00-30.00

Manganese Ore	
Including war risk but not duty, cents per unit cargo lots.	
Caucasian, 50-52%	54.00-55.00
So. African, 50-52%	54.00-55.00
Indian, 49-50%	54.00
Brazilian, 46%	50.00
Cuban, 50-51%, duty free	67.50
Molybdenum	
Sulphide conc., lb., Mo. cont., mines	\$0.75

Sheets, Strip

Sheet & Strip Prices, Pages 90, 91

Pittsburgh—There is little change in the sheet market. Backlogs are beginning to mount; specifications and releases on previous placements are heavy. Both integrated and non-integrated plants report sheet mills are having difficulty in obtaining enough semifinished. Operations in sheet mills are running close to 85 per cent of capacity. Galvanizing operations last week were unchanged at 83 per cent.

Cleveland—Orders appear in the same volume as November. Opening of books for first quarter was the occasion for taking orders off waiting lists and formally entering them on books. One maker has revised extras slightly on certain descriptions of cold-finished sheets, amounting to an advance.

Chicago—Orders for sheets and strip, giving signs of easing a week or so ago, swelled substantially last week. No sign of let-up is now in sight, although some authorities feel buying will decline with the approach of the holiday season and inventory period early in the new year. Deliveries are slightly more extended as mills are unable to keep up with new orders.

Boston—Replacement orders for sheets are active, but volume is hampered by lengthening deliveries. Buyers in more instances are shopping around, offering tonnage with shipment a leading factor. However, most mills are now well filled and there are few opportunities to better the general average as to delivery. Industrial demand is broadening with stamping shops more active. On most sheet finishes eight to ten weeks is promised. Incoming narrow cold strip orders are active. Strip mills are operating at capacity and will enter the new year with heavy backlogs.

New York—Sheet business has eased slightly, although the delivery situation is gradually becoming more extended. Galvanized sheets are quotable in most instances at around seven to eight weeks, and while some producers can do better on the uncoated products, still others find themselves in the opposite position.

Philadelphia—Sheet orders have slackened but mills still are being pressed for shipment. Deliveries vary widely, some producers naming March shipment on hot and cold-rolled, while January rolling is available in some instances. Buyers are disregarding the season in attempts to enlarge inventories, contrary to the usual trend at this period.

Buffalo—More extensive forward buying is noted in sheets and strip. As a result mills have sufficient

tonnage on books to support capacity rolling schedules well into first quarter. Motor specifications are still substantial, but miscellaneous demand, backed by defense orders, is obviously the chief supporting factor.

Cincinnati—Reaffirming of prices on sheets has not changed buying, which holds at 150 per cent of mill capacity. The most severe delivery pinch now is in galvanized, demand running counter to normal seasonal trends. Mills are studying automotive needs for first quarter for the key to expedited deliveries on miscellaneous specifications.

St. Louis—Demand for sheets and

strip continues active, as deliveries on most descriptions become more extended. Releases on narrow cold strip are freer, with some customers pressing for deliveries.

Birmingham, Ala.—Sheet production, while still steady and approaching comfortable capacity, is not pushed by current bookings, which are in lighter volume. A moderate amount of strip is being turned out.

Toronto, Ont.—Mill representatives report no slackening in sales and backlogs are piling rapidly, with delivery dates now well into second half on current contracts. Large orders also are being placed



To the Man With a Rust Problem

TO THE EXECUTIVE
TO THE PURCHASING AGENT
TO THE MAINTENANCE ENGINEER

SUBJECT: Your Rust Problem

Gentlemen:

PENETROL stops further rust action on rusty steel—and you can paint over it. You don't have the trouble and expense of trying to remove all the rust.

But after rust action has been stopped with PENETROL the future protection of the surface is also a technical problem, which interests us as well as PENETROL users.

In order to be of service not only to the specific rust problem but beyond it, our staff includes a metallurgist, an electrical engineer, a chemical engineer, a corrosion engineer and a mechanical engineer.

THE FLOOD COMPANY
6217 Carnegie Avenue
Cleveland, Ohio



with United States mills for more speedy delivery and it is understood that most steel for the automotive industry is coming from across the line, and buying continues unabated.

Plates

Plate Prices, Page 90

Cleveland—Demand is more orderly but still brisk. Deliveries tend to slip a little further behind. Some consumers are buying from mills far out of this district, paying the

basing point price plus freight, thereby getting deliveries in four weeks instead of the customary eight to twelve weeks.

Pittsburgh—Market is unchanged. Delivery tension has not slackened. New specifications continue to come in and mills are operating as near capacity as possible.

Chicago—Bookings of steel plates are well maintained with fabricators of heavy equipment and railroad car builders operating at high rates. Deliveries of plates, in the neighborhood of 9 to 10 weeks, is proving a handicap.

Boston—Several tank contracts are being placed in this territory

for fabrication in other districts and installation at TNT plants at Wilmington, Ill., and Baytown, Tex. More than 2000 tons of plates are involved. A million-gallon stand-pipe, Fort Devens, Mass., and three 400,000 elevated tanks, Camp Edwards, Mass., are among recent large tank orders, three going to Pittsburgh-Des Moines Steel Co., Pittsburgh, and one 400,000-gallon unit to Chicago Bridge & Iron Co., Chicago. Other tank work includes fifty 5000-gallon units for Quincy Oil Co., Quincy, Mass. New large tank inquiry in New England is light, however. With plate deliveries ranging from 10 to 12 weeks, miscellaneous demand continues active with shipyard specifications heavy.

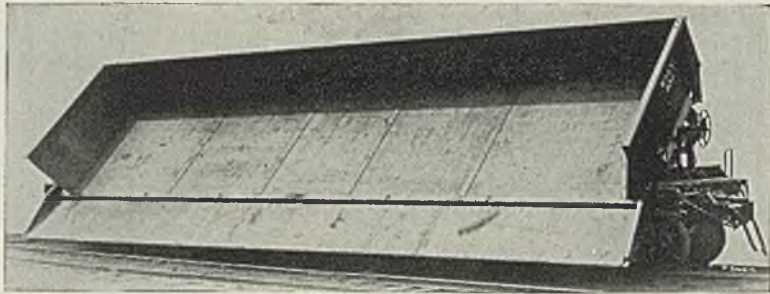
New York—Plate demand is heavy from domestic sources and, combined with expanding export business, is forcing delivery dates further ahead. Six to eight weeks is the best many sellers can do, with further delay on wider plates. Export deliveries are quoted by most mills as even further away. Export prices have been advanced \$2 to 2.45c, f.a.s.

Philadelphia—Plate business has leveled off and in the case of producers with most extended deliveries a smaller volume is noted. Backlogs remain heavy and some mills are asking eight to ten weeks for shipment of certain sizes. Four to five weeks' delivery may be done on narrower widths and lighter gages, although this is not true of all mills. Consumers are pressing for shipment, there being no tendency to postpone receipts until after the end of the year.

Birmingham, Ala.—Mills have a large accumulation of plate tonnage yet to be rolled, much of which will go over into 1941. Current demand is steady.

Seattle—Shops report a good volume of business in small tonnages and backlogs are increasing. Boeing Aircraft Co., Seattle, has an additional award at \$249,015 from the war department for fabricating fuel tank spares for flying fortresses, tonnage unstated. War department plans extensive expenditures at Everett, Wash., airport and Sunset Field, Spokane, including fuel storage capacity.

Toronto, Ont.—Orders for several thousand tons of plates are pending in connection with Canada's ship construction program, and in addition large tonnages will be required for various other war work. Armor plate for war tanks is under increasing demand, with additional large buying on this account in prospect for early next year.



Koppel 50 cubic yard (level) capacity automatic air dump car

Check THESE 5 MONEY-SAVING ADVANTAGES of KOPPEL AUTOMATIC AIR DUMP CARS.



Lower initial cost per cubic yard of car capacity.



Fewer cars of this capacity are required to do your usual job . . . less overhead.



Operating and maintenance costs are correspondingly lower.



Wider range of service is economical with these larger capacity cars.



Better dead weight to live load ratio.

PRESSED STEEL CAR CO., INC.

(KOPPEL DIVISION)

NEW YORK

PITTSBURGH

CHICAGO

Plate Contracts Pending

Unstated tonnage, two welded steel terminal barges, 285 x 75 x 10 1/2 feet.

Inland Waterways Corp., New Orleans; only one received Dec. 2; no award, plans and specifications being revised for new bids.

Bars

Bar Prices, Page 90

Pittsburgh—There is no apparent easing in bar buying. Some consumers who had placed bar business with deliveries scattered over several months have indicated they will take delivery as soon as possible on all items. Backlogs continue to rise, with local mills running close to 100 per cent.

Cleveland—One large producer is virtually sold for first quarter on bars and rods, but can squeeze in a few bookings to regular customers on certain sizes. Bar demand is still the best diversified item, with a large aggregate of small individual lots. The larger size bar mills will be increasingly busy rolling shell steel but the peak is yet to come.

Chicago—Orders and inquiries for steel bars increased somewhat in the last few days, and served to extend deliveries further. Demand is well diversified as to consuming industries and to grades and sizes. Alloys are in largest volume.

Boston—With most defense buying yet to be done, demand for bars is broadening. Government shops are covering on large tonages, including alloys, for delivery well into next year. Having increased operations, the Watertown, Mass., arsenal bought 6000 tons of carbon stock for induction furnace melting for shipment beyond second half in equal lots monthly. Three producers share in the order. For chain production, the Boston navy yard has estimates on 2686 tons of nickel steel bars and bids close Dec. 17 on 1083 tons of which 450 tons are nickel steel ingots, while still another inquiry is up for bids Dec. 20.

New York—Hot carbon bar deliveries are being pushed steadily backward. Except for certain light rounds and flats, most producers are now unable to offer much before the middle of February. The same situation applies to cold-drawn carbon bars, with the general range of delivery dates a little more extended. Shipment schedules on hot alloy bars now are close to 20 weeks, with specially heat-treated alloy bars difficult to obtain much before fourth quarter of next year.

Birmingham, Ala.—Bar production is steady with output unofficially estimated at 80 to 85 per cent. Merchant and reinforcing bars are in good demand.

Philadelphia—Business continues heavy, with buyers shopping around in efforts to obtain best available

delivery. First quarter rolling schedules steadily are being filled, forward bookings of alloy grades being especially large. Heavy consumption is preventing extensive additions to stocks.

Buffalo—Order backlogs continue to grow and bar deliveries are being lengthened. Alloys are not promised before second quarter except on priority for defense needs. Increased tonnage is moving to aviation firms.

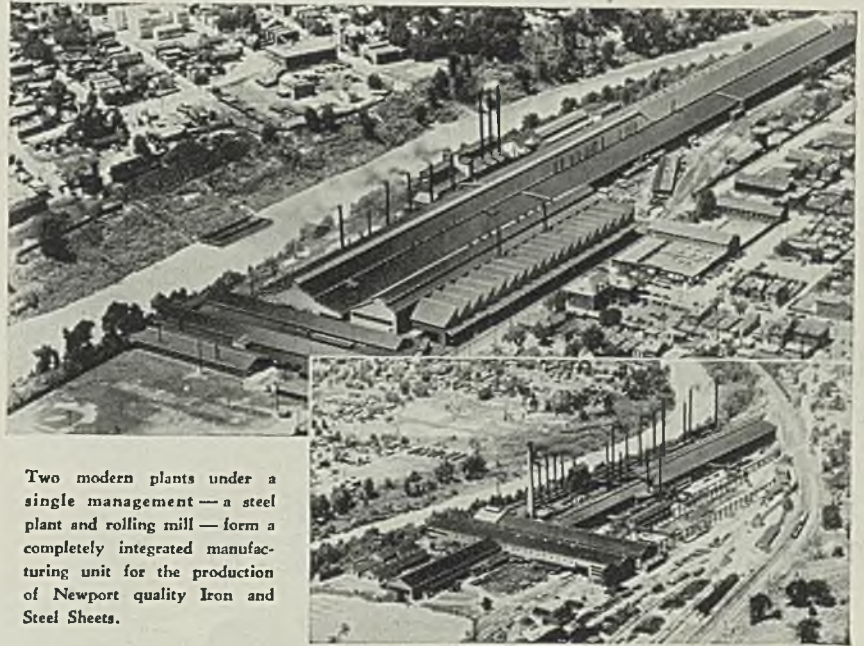
Toronto, Ont.—Bar backlogs are increasing, with delivery dates now advanced to February, and prospective business showing indications of passing all previous records.

War industries are absorbing practically all present production, and further large orders are in prospect on this account.

Pipe

Pipe Prices, Page 91

Pittsburgh—Pressure is unchanged and unusually heavy on merchant pipe, mechanical tubing and pressure tubing. There has been a slight pick-up in oil country goods, but it does not indicate a change in the normal inactivity



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Hot Rolled Sheets • Newport Electrical Sheets • GOHI Pure Iron-Copper Alloy Sheets • Globe Brand Galvanized Steel Sheets, Roofing and Siding • GOHI Enameling Iron Sheets • KCB Copper Steel Sheets • Newport Long Terme Sheets • Newport Galvannealed Sheets • Newport De-Luxe Metal Sheets.

It is no small accomplishment to produce iron and steel sheets of fine quality in these days of strict metallurgical control and modern manufacturing processes. However, to maintain uniformly highest quality during almost half a century of service to critical buyers, is the achievement of Newport, where since 1891 there has been but one standard of excellence; with every sheet the best for the particular purpose for which it is intended.

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ANDREWS PRODUCTS IN CARBON AND ALLOY STEEL: BARS • PLATES • UNIVERSAL MILL PLATES • SHEET BARS • BILLETS • BLOOMS • SLABS.

of the market at this season.

Cleveland—Standard merchant pipe can be delivered in one to two weeks, the promptest steel product, due to large stocks in warehouses of steelmakers. Demand keeps up to the brisk pace of November, buying for cantonments being a feature. Tentative inquiry has been received for seamless tubes for shell casings. Mechanical tubing is exceedingly brisk, a recent inquiry calling for two carloads.

Boston—While demand has slackened somewhat, merchant steel pipe buying for defense construction maintains volume above normal

for this quarter. In industrial and oil needs buying has not expanded much above normal. Resale prices are firmer; also replacement quotations by mills. Cast pipe is also reflecting demand on the part of emergency expansion of water lines at army cantonments.

New York—Merchant pipe business continues to slow up as a result of seasonal influences. Construction requirements are said to be down appreciably, compared with a month ago. Demand for mechanical tubing is being well sustained.

Seattle—Recent awards have brought 1940 totals in the Pacific

Northwest well above a year ago. Inquiry for cast iron pipe continues strong. About 200 tons are involved in a water and sewer system for the Sand Point, Seattle, housing project.

Cast Pipe Placed

425 tons, large diameter pipe, for Hartford, Conn., to Warren Foundry & Pipe Co., Everett, Mass.

Rails, Cars

Track Material Prices, Page 91

Railroad buying last week included 40,580 tons of rails and accessories, 35 locomotives and 657 freight cars, with inquiries for 700 cars.

The high light of the week was purchase by the Brazilian ministry of transportation and public works of 18,260 tons of rails and 458 freight cars. Elgin, Joliet & Eastern led locomotive purchases with 15 diesel-electric. The U. S. S. R. placed ten electric switch engines.

Locomotives Placed

Elgin, Joliet & Eastern, 15 diesel-electric locomotives, 9 of these, 7 of 600-horsepower and 2 of 1000 horsepower to the Electro-Motive Corp., La Grange, Ill., three of 600 horsepower and two of 1000 horsepower, to American Locomotive Co., New York, and 1 of 1000 horsepower to Baldwin Locomotive Works, Eddystone, Pa.

Gulf, Mobile & Ohio, four 660-horsepower diesel-electric locomotives, to American Locomotive Co., New York.

Jones & Laughlin Steel Corp., one steam freight locomotive to American Locomotive Co., New York.

Monongahela Connecting Line, two 750-horsepower diesel-electric switch engines, to General Electric Co., Schenectady, N. Y.

Northeast Oklahoma, one 500-horsepower diesel-electric locomotive, to General Electric Co., Schenectady, N. Y.

Russian government, ten 250-horsepower electric switch engines, to General Electric Co., Schenectady, N. Y.

United States army, two diesel-electric locomotives, 300 and 350 horsepower to General Electric Co., Schenectady, N. Y.

Car Orders Placed

Alliquippa & Southern, 25 ninety-ton gondolas, to own shops.

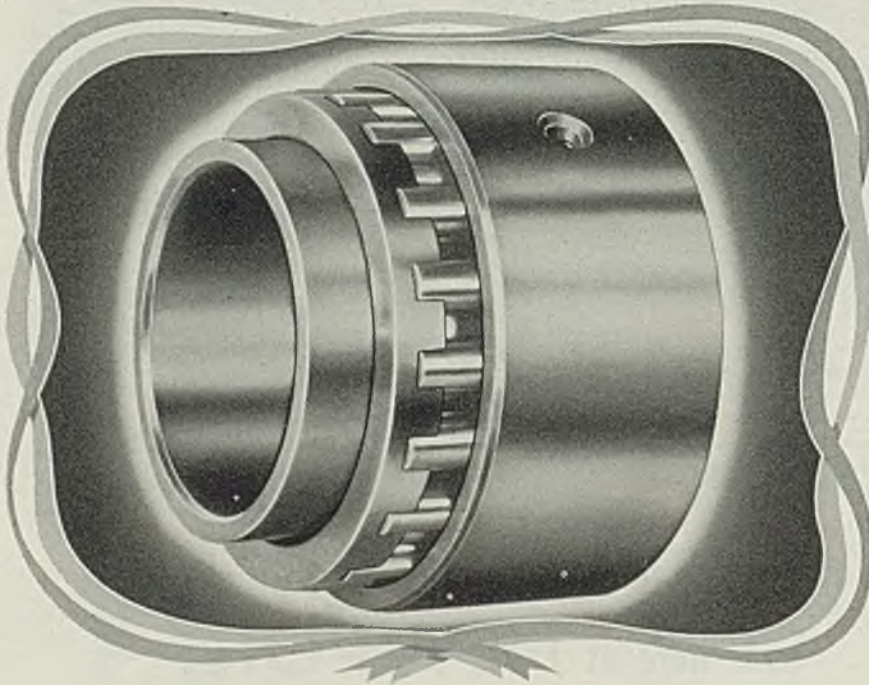
Erie, fifty 70-ton steel flat cars, to Greenville Steel Car Co., Greenville, Pa.

Ethyl Gasoline Corp., 24 tank cars of varying capacities, to American Car & Foundry Co., New York.

Ministry of Transportation and Public Works, Brazil, 458 freight cars, with 150 thirty-ton flat cars and 150 thirty-ton box cars, to Pullman-Standard Car Mfg. Co., New York; 150 thirty-ton gondolas and eight 30-ton tank cars, to American Car & Foundry Export Co., New York.

Northern Pacific, 2500 freight cars. American Car & Foundry Co., New York, will build 1000 box cars and 200 ballast cars in St. Louis plant and 300 coal cars in Huntington, W. Va. Pullman-Standard Car & Mfg. Co., Chicago, will build 900 box cars at Michigan City, Ind. Northern Pacific will construct

"AMERICANS"



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In days ahead, continuous, unfaltering service from heavy producing and handling equipment will depend on the ability of its roller bearings to withstand the punishment of 24 hour-a-day use. American Super Heavy Duty Roller Bearings are built with the vital extra capacity to take this grueling treatment day after day, and month after month. Soundly engineered, precisely mated, brutally strong—they will help keep your heaviest equipment running smoothly in defense of America and to the credit of "Americans." Write today for technical facts.

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Pacific Coast Office: 1718 S. Flower St., Los Angeles, Cal.



AMERICAN
Heavy-Duty **ROLLER BEARINGS**

100 box cars in its own shops at Laurel, Mont.
Tennessee Central, 100 forty-ton box cars, to Pullman-Standard Car Mfg. Co., New York.

Car Orders Pending

Chicago, Indianapolis & Louisville, 100 fifty-ton box cars and 100 fifty-ton flat cars.
Elgin, Joliet & Eastern, 500 fifty-ton box cars; bids asked.

Rail Orders Placed

Central of New Jersey, 4500 tons to Bethlehem Steel Co., Bethlehem, Pa.
Delaware, Lackawanna & Western, 5000 tons, 131-pound rail, to unstated producers.
Ministry of Transportation and Public Works, Brazil, 18,260 tons, track and accessories, to United States Steel Export Co., New York.
Seaboard Air Line, 12,820 tons; 7720 tons, to Tennessee Coal, Iron & Railroad Co., 5100 tons to Bethlehem Steel Co. Previously reported as all to Tennessee company.

Buses Booked

A. C. F. Motors Co., New York: Twenty-seven 31-passenger for Pittsburgh Motor Coach Co., Pittsburgh; thirteen 40-passenger for Boston Elevated Railway Co., Boston; nine 35-passenger for Worcester Street Railway Co., Worcester, Mass.; ten 32-passenger for Middlesex & Boston Street Railway Co., Newtonville, Mass.; five 33-passenger for Chicago & Calumet District Transit Co., Hammond, Ind.; four 36-passenger for Gary Railways Co., Gary, Ind.; eleven 35-passenger for Eastern Massachusetts Street Railway Co., Boston; four 37-passenger for Florida Motor Lines Corp., Jacksonville, Fla.; five 36-passenger for Memphis Street Railway Co., Memphis, Tenn.; four 36-passenger for Citizens Rapid Transit Corp., Alexandria, Va.; one 28 and one 31-passenger for A. B. & W. Transit Co., Alexandria, Va.
Kenworth Motor Truck Co. and Pacific Car & Foundry Co., Seattle: Ten buses, cruiser and suburban types for North Coast Transportation Co., Seattle.

Wire

Wire Prices, Page 91

Pittsburgh—Buying and releases continue to increase. Mill capacity is pointed toward production of wire alone, and items such as nails, fence and the like receive secondary consideration. Export business continues fair, with much tonnage available and most producers asking premiums for export business.
Cleveland—Demand for wire products does not keep up to the average for steel items, partly because farm districts are not anticipating needs and probable tightness in 1941. Manufacturers' wire can be delivered in four weeks.

Boston—Wire orders continue in excess of shipments. Finishing departments are operating at capacity in most instances and deliveries are more extended, partly due to an increased tight situation as to rod

supplies on more finishes. Specialty backlogs are heavy, also rope and spring wire. While some pressure on delivery has eased, forward buying on the part of a greater number of consumers, exclusive of the automotive, has not materially slackened pressure on mills.

New York—Incoming wire volume continues heavy and larger than shipments. Only in spots are there indications of decline in buying, with demand widely diversified. Automotive interests meet resistance in efforts to buy too heavily in advance. Rod supplies remain tight and limited on more analyses.

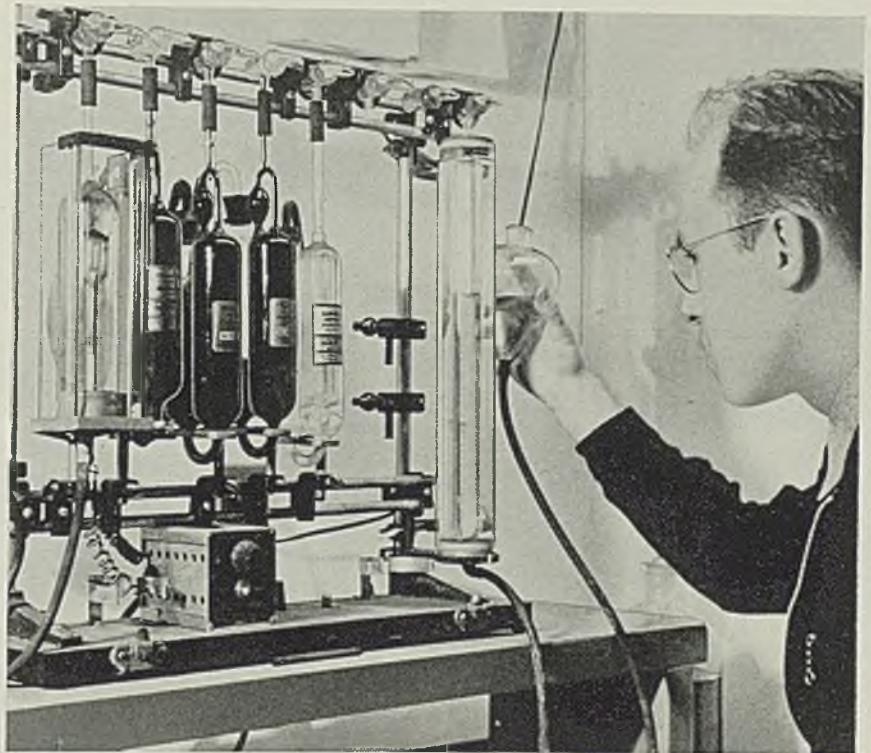
Galvanized material producers have difficulty in filling zinc requirements. Nail demand continues strong.

Birmingham, Ala.—Wire products remain active. Current bookings probably are at a par with shipments, and a large tonnage remains on books.

Tin Plate

Tin Plate Prices, Page 90

Pittsburgh — Production is unchanged at about 48 per cent of capacity. New business is slightly



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less than last week, but the change has been small.

Carnegie-Illinois Steel Corp. has reaffirmed prices on coke tin plate and special coated manufacturing ternes for delivery to March 31, at \$5 per base box and \$4.30 per base box, respectively, Pittsburgh or Gary, Ind.

■ Factory sales of mechanical stokers in October totaled 25,503 units, against 31,337 in September and 18,416 in October, 1939, the bureau of the census reports. Sales for ten months this year aggregate 134,545 units, compared with 90,829 in ten months last year.

Shapes

Structural Shape Prices, Page 90

Pittsburgh—Shape inquiries continue in fairly good volume. Local producers indicate no decline in backlogs and the pressure for delivery continues heavy.

Boston — Structural inquiry is heavier, led by 23,000 tons for a shipyard extension at Fore River, Quincy, Mass., on which bids are in. Bridge work pending is also stronger, although projects are limited. Industrial plant extensions are taking substantial tonnages in

small lots and the Boston navy yard has a considerable tonnage yet to be placed.

Cleveland—The ordnance plant at Ravenna, O., is the most active outlet, two lots totaling 900 tons for magazine buildings having been placed. Prospects over the next three months loom better than current business. Deliveries run three to four months. Prices of fabricated steel are usually firm.

Chicago—National defense construction is commanding the attention of fabricators with several large projects pending. This, with recent bookings, is serving to keep shops operating near capacity. Mills have heavy backlogs for shapes and deliveries are the main concern of fabricators.

New York—Awards in the immediate New York district are heavier, due to 6000 tons for bridges placed with an Ohio fabricator. Indications are that bookings in December will show a sharp decline from the previous month, to less than 150,000 tons from the entire country. Award of 72 government hangars, approximately 19,000 tons, recently opened, will be widely distributed, no one shop getting more than six or seven units. Tonnage being estimated in the East is heavier.

Philadelphia—Extended deliveries still prevail on plain shapes despite a reduced volume of large defense plant projects. Pending work is headed by 2000 tons for a machine shop for Midvale Co. Bids close later this month on 2250 tons for three New Jersey bridges.

Buffalo — No signs of seasonal slackening in structural steel have appeared. Fabricators' backlogs continue to grow with several new projects calling for substantial tonnage. Bethlehem Steel will fabricate 1600 tons for a new blast furnace at its Lackawanna plant.

Seattle—Fabricating shops are working at capacity, with considerable tonnage in prospect for early placement. Deliveries from eastern mills are somewhat delayed, interfering with fabrication in some cases. Largest award last week was 9210 tons for 896 transmission towers for the Bonneville project, go-

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IN THE CENTER OF MID-TOWN NEW YORK

Shape Awards Compared

	Tons
Week ended Dec. 14	32,761
Week ended Dec. 7	14,966
Week ended Nov. 30	33,976
This week, 1939	25,806
Weekly average, year, 1940	27,984
Weekly average, 1939	22,411
Weekly average, Nov.	28,153
Total to date, 1939	1,127,341
Total to date, 1940	1,299,203

Includes awards of 100 tons or more.

ing to American Bridge Co., Pittsburgh.

St. Louis—Booking of numerous small jobs, principally in connection with the defense program, have enabled fabricators to maintain the high rate of operations which has obtained since late October.

Birmingham, Ala.—Shape production is at capacity, with little slackening in current demand. A heavy backlog will keep production high for some weeks.

Toronto, Ont.—Heavy demand for structural shapes continues with most business directly for war projects. Fabricators report orders which will keep plants at capacity for several months. Five industrial war projects will require approximately 18,000 tons of steel, and several smaller undertakings are to be started immediately for which about 7000 tons will be needed. Orders placed during the past week exceeded 12,000 tons.

Shape Contracts Placed

9210 tons, 896 transmission towers for Bonneville project in Washington state, to American Bridge Co., Pittsburgh.

5000 tons, elevated highway approaches, contracts B-13 and B-15, Battery-Brooklyn tunnel, Brooklyn, N. Y., to Mt. Vernon Bridge Co., Mt. Vernon, O., through P. T. Cox Construction Co., New York.

4200 tons, eight warehouses, air corps, war department, Hill Field, Ogden, Utah, Al Johnson Construction Co., Minneapolis, and James Leck Co., Minneapolis, general contractors, to Kansas City Structural Steel Co., Kansas City, Kans.

1800 tons, dock, Atlantic Refining Co., Philadelphia, to Belmont Iron Works, Philadelphia.

1600 tons, blast furnace, Bethlehem Steel Co., Lackawanna, N. Y., to be fabricated by Bethlehem.

1360 tons, shipyard extensions, Federal Shipbuilding & Drydock Co., Kearny, N. J., to American Bridge Co., Pittsburgh.

1000 tons, Hamilton avenue bridge, Gowanus canal, Brooklyn, N. Y., to Mt. Vernon Bridge Co., Mt. Vernon, O., through P. T. Cox Construction Co., New York.

1000 tons, shop building and airplane repair dock, Duncan Field, Texas, to North Texas Iron & Steel Co., Fort Worth; Austin Bros., Dallas, and Illinois Steel Bridge Co., Jacksonville, Ill.; Qulste & Andrews, Fort Worth, contractor; previously reported entirely to North Texas Iron & Steel Co.; latter also reinforcing bars

800 tons, aviation facilities, naval base, Dallas, Tex., 600 tons to Mosher Steel Co., Dallas and 200 tons, Austin Bros., Dallas; Henger Construction Co., Dallas, contractor.

609 tons, 21 smokeless powder buildings, ordnance plant, Ravenna, O., to Bethlehem Steel Co., Bethlehem, Pa.

550 tons, four buildings, Fore river shipyard, Quincy, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, two air corps hangars, Ellington Field, Texas, to Mosher Steel Co., Houston; C. D. Everett, Houston, contractor.

400 tons, addition St. Clares hospital,

New York, to Harris Structural Steel Co., New York.

400 tons, bridge, Portsmouth, N. H., to American Bridge Co., Pittsburgh, through O. W. Miller Co. Inc., Ludlow, Mass., contractor.

400 tons, building 150, Frankford arsenal, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.

275 tons, state highway bridge, Irvona, Pa., to American Bridge Co., Pittsburgh.

265 tons, 23 magazine buildings, ordnance plant, Ravenna, O., to American Bridge Co., Pittsburgh.

237 tons, state bridge, contract 2074, John R. Gates, general contractor, Banner City, Ind., to Pan-American Bridge Co., New Castle, Ind.

230 tons, submarine base railway supports, New London, Conn., to American Bridge Co., Pittsburgh.

225 tons, building, Sherwin-Williams Co., Gloucester, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

225 tons, shop addition, Wyman & Gordon Co., Worcester, Mass., to Stafford Iron Works, Worcester.

200 tons, generator house, Elizabethtown Consolidated Gas Co., Elizabeth, N. J., to American Bridge Co., Pittsburgh.

175 tons, addition to high school, Great Neck, N. Y., to George J. Schantz Iron Works, New York.

160 tons, shop building, Wall Rope Works, Beverly, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

160 tons, transportation building, Puget Sound navy yard, Washington, to Isaacson Iron Works, Seattle.

150 tons, highway bridge, Corfu, N. Y., to American Bridge Co., Pittsburgh.

125 tons, bridge, Hinds county, Missis-

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Behind the Scenes with STEEL

Blackout Hints

■ Paints that "glow in the dark" are being applied to several war industries plants in this country to show workers and executives "office traffic lanes," location of desks, machinery, etc., during an air-raid. The idea, quite logically, comes from England and the paint is made of calcium and barium sulphides, which absorb light, and glow long after the light source is turned off.

Just In Case

■ Douglas Aircraft's new \$11,000,000 plant on the West Coast will have elaborate underground storage facilities for planes, supplies, etc., and will be equipped with ingenious devices above ground that immediately switch off all illumination as the air-raid warning sounds.

In The Dark

■ Speaking of blackouts, the big Department of Commerce building in Washington had its own recently . . . when the power failed, due to a short circuit. The employes got around with the aid of kerosene lanterns, and had a swell time pretending to work for about an hour.

What, No Sardines!

■ Mysteries will never end. American Can spokesmen tell us there never has been and never will be such a thing as a sardine, even though we're really fond of these non-existent delicacies. What you're really ordering is a can "of any of a number of varieties of small fish." It's the style of preparing and packing that makes them sardines. It's the can that counts.

Cold Shoulders

■ From the Harvard School of Public Health comes word that might be of interest to far-visioned (very far-visioned) health and safety experts. The report states that "Women aren't just a little cooler than men, but are several degrees cooler. While their torsos are only half a degree cooler, their legs and heads are three degrees cooler than the

male's, their arms four degrees, and their hands and feet five degrees." So, for Christmas you'd better get the little woman a nice long sleeve sweat shirt, heavy woolen mittens and some fur-lined galoshes and blow yourself to a pair of toeless pumps and Scotch kilts.

Inconsistencies

■ Oil and gas is costliest in the oil field country; Cigarettes cost more in tobacco areas; "Real Southern Barbecues . . . traditions of the Deep South" imported from Chicago; Souvenirs of your visit to California stamped "Made in Japan."

In The Works

■ Just three more weeks and you will have on your desk STEEL's 1941 Yearbook of Industry issue. It will be bigger, better and more beautiful than ever. We guarantee you'll like it.

Mail Bag

■ In the mail this week: A terrific bawling out by Tom Evers Jr., Cleveland, who apparently agrees with Mr. Ickes on the American press . . . An aside by J. C. Farrell, Easton Car & Construction—*A Necessity is something one can do without to make a down payment on a luxury* . . . A suggestion by J. N. Cutrone, "A Weirton Potential," that the New Dealers square themselves (partially) with the Willkieites by appointing Mr. Tom Girdler Secretary of Labor . . . A cry for help from N. D. Martin, Firestone Steel Products and half the cost dept. for the number of coconuts in that problem from 'way last spring . . . and a card from Carl Bails, Long Mfg. Co., Detroit, for proof that Rudolph murdered his brother (in our mystery of last July) so that an impossible guy by the name of Kelly can be made to pay off . . . deep sympathy from "Uldrth" of St. Louis for our saying that Basic Dolomite ad was on page 6 instead of 5 . . . and a nice little note from an old girl friend we haven't seen for yars and yars.

SHIRLU.

shippl, to Nashville Bridge Co., Nashville, Tenn.; W. G. Cook, Forest, Miss., contractor; reinforcing bars to Truscon Steel Co., Youngstown, O.

105 tons, crane runway, Fore river shipyard, Quincy, Mass., to Bethlehem Fabricators Inc., Bethlehem, Pa.

100 tons, bridge, Oakfield, Me., to Phoenix Bridge Co., Phoenixville, Pa.; W. H. Hinman Inc., North Anson, Me., contractor.

100 tons or more, depot supply warehouse, Duncan Field, Texas, to Mosher Steel Co., Houston, Tex.; Hill & Combs, San Antonio, contractor.

Unstated, four cranes for Puget Sound navy yard to Harnischfeger Corp., Milwaukee, and Euclid Crane & Hoist Co., Euclid, O.

Shape Contracts Pending

23,000 tons, wet basin slp, shipways, Bethlehem Shipbuilding Co., Fore river yards, Quincy, Mass.; bids in.

8400 tons, elevated highway sections, Brooklyn, N. Y., contracts B-9 and B-16; bids Dec. 17 to triborough bridge authority, New York.

4500 tons, storage warehouses and buildings, Wilmington and Joliet, Ill., for government.

3700 tons, 1941 bridge requirements, various locations, for Great Northern railway.

3400 tons, extension to shipways, Camden, N. J., for New York Shipbuilding Corp., Camden, N. J.

3000 tons, 1941 bridge requirements, various locations, Chicago, Rock Island & Pacific railroad, Chicago; reduced from 5000 tons as announced in STEEL Nov. 11.

2500 tons, gun directors building, for General Electric Co., Pittsfield, Mass.

2355 tons, bridges, three contracts, New Jersey; bids Dec. 27 and Dec. 30, Trenton, N. J.

2000 tons, machine shop, Midvale Co., Philadelphia; bids in to United Engineers and Constructors Inc., general contractor.

1700 tons, hydraulic director building, for General Electric Co., Schenectady, N. Y.

1500 tons, bridge, Portland, Me.; bids in January.

1300 tons, addition to mill buildings, for American Rolling Mill Co., Middletown, O.

1200 tons, highway bridge, St. Louis county, Missouri, at Clayton and Warson roads; Blackwell Corp., East St. Louis, Ill., low.

1000 tons, apartment house, for Irving Broff, New York.

850 tons, highway grade separation, Brooklyn, N. Y., for Long Island railroad.

830 tons, office building, for Washington Gas Light Co., Washington, D. C.

800 tons, grade elimination, Woodhaven boulevard, Brooklyn, N. Y., for Long Island railroad, Polerier & McLane Corp., low.

700 tons, apartment, Central Park South, New York, to Dreier Structural Steel Co. Inc., New York.

630 tons, mill building, for United Engineering & Foundry Co., Youngstown, O.

620 tons, power house extension, for West Virginia Hydroelectric Co., Ahos, W. Va.

560 tons, factory building, for Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

550 tons, tuberculosis hospital, Riverside hospital, New York, for city.

530 tons, pavillon, for Roosevelt hospital, New York.

515 tons, bottling plant, for P. Ballantine Sons, Newark, N. J.
 500 tons, hangar building, for U. S. treasury department, Hills Grove, R. I.
 450 tons, hangar, Hillsboro, R. I.; bids Dec. 17.
 425 tons, factory building, National Carbon Co., Niagara Falls, N. Y.
 400 tons, branch building, for Federal Reserve bank, Charlotte, N. C.
 350 tons, addition to tank and plate shop, for Allis-Chalmers Mfg. Co., West Allis, Wis.
 350 tons, extension to building No. 18 of General Electric Co., Erie, Pa.
 350 tons, building addition, Buffalo Savings Bank, Buffalo.
 330 tons, state bridge, Tucker county, West Virginia.
 320 tons, state bridges, Franklin, Lebanon and Windham, Conn.
 315 tons, four fixed wheel penstock gates, specification 942, Earp, Calif., for bureau of reclamation.
 310 tons, 6000-men mess hall, Lowry field, Denver, for war department.
 300 tons, plant building, Chicago Rivet & Machine Co., Bellwood, Ill., E. L. Lonergan Construction Co., Chicago, contractor, to A. F. Anderson Iron Works, Chicago.
 275 tons, addition to White Motor Co., Cleveland.
 270 tons, state bridge over Baltimore & Ohio railroad, Tuscarawas county, Ohio.
 265 tons, combined shops building, Curtis bay, Baltimore, for coast guard.
 225 tons, addition to storage building, Bremerton, Wash., for U. S. navy.
 220 tons, motor oils building, for Standard Oil Co., Baltimore.
 205 tons, Big Sioux river bridge, Union county, South Dakota, Des Moines Steel Co., Des Moines, Iowa, low.
 200 tons, power plant, Quonset Point, R. I., for U. S. navy.
 190 tons, processing building, for Procter & Gamble Co., Port Ivory, N. Y.
 170 tons, addition to storage building, Puget Sound navy yard, Washington; bids in.
 150 tons, highway bridge, Washington county, Mo.; Deering & Davidson, St. Louis, low.
 140 tons, beam spans, Spokane, Wash., and Luverne, N. D., for Great Northern railway.
 120 tons, telephone building, Bayside, N. Y., for New York Telephone Co.
 100 tons, building No. 15, armory, Springfield, Mass.; bids in.
 100 tons, joists, nurses' home and school, Mercy hospital, Canton, O.; all bids rejected.
 100 tons, shapes and bars, highway project, Wolcott-Morrissetown, Vt.; bids Dec. 20, H. E. Sargent, commissioner of highways, Montpelier; also 25 tons bars, highway, Rockingham, Vt.
 Unstated tonnage, U. S. army warehouses, Columbus, O.; bids Dec. 21.

Reinforcing

Reinforcing Bar Prices, Page 91

Pittsburgh—Major rail bar producers have followed new billet steel producers in increasing the quotation on rail reinforcing bars to 2.15c per pound, on a parity with new billet steel. In addition, export price on new billet reinforcing bars is now 2.35c, f.a.s., an in-

crease of 20 cents per hundred pounds. Tonnage continues quite heavy, and it is virtually impossible to obtain shipment in less than four weeks on new business, although producers here report deliveries on previously placed tonnage are being made on schedule.


Cleveland—The largest project calls for 300 tons for housing at Barberton, O. Prices are firmer and bids on some projects are rejected as builders are not reconciled to the higher prices.

Chicago—Except for government work, involving large tonnages, few inquiries are before reinforcing

steel interests. Miscellaneous jobs, mostly outside the immediate Chicago area, will require only small tonnages.

Boston—For the time being bridge requirements are heavier. The Thames river span, New London, Conn., will take 1275 tons. Most active housing projects have been placed, the leading inquiry being 750 tons for Cambridge, Mass. Deliveries of concrete bars are becoming a problem, with nearby stocks low and considerable miscellaneous tonnage specified for prompt delivery.

New York—Stocks of reinforcing



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bars for immediate delivery are small and with mill deliveries lengthening distributors experience difficulty in getting replacements. Inquiry and pending volume are heavier but current awards are down slightly. New Jersey has 1922 tons pending for bridges and highways.

Seattle—Substantial backlogs are reported by rolling mills. Operating to capacity, their present objective is to make deliveries promptly. Small projects are numerous and furnish considerable total tonnage.

Reinforcing Steel Awards

- 1100 tons, bureau of sewers, contract No. 2, Queens, N. Y., to Republic Steel Corp., Cleveland, through Carroll-McCreary Co. Inc.; Delham Construction Co., contractor.
- 1100 tons, Belvedere Corp. warehouse, Lawrenceburg, Ind., to Pollak Steel Co., Cincinnati; Ferro Concrete Construction Co., contractor.
- 800 tons, Washington state highway projects in Yakima, King and Snohomish counties, to Northwest Steel Rolling Mills, Seattle.
- 450 tons, eight warehouses, air corps, war department, Hill field, Ogden, Utah, Al Johnson Construction Co., Minneapolis, and James Leck Co., Minneapolis, contractors, to Bethlehem Steel Co., Bethlehem, Pa.
- 275 tons, Chicago subway, section D-2C, M. J. Boyle & Co., Chicago, to Ceco Steel Products Corp., Chicago; bids Oct. 11.
- 250 tons, postoffice, Charleston, W. Va., to West Virginia Rail Co., Huntington, W. Va.; T. G. Eagen Engineering Co., contractor.
- 243 tons, Panama Canal schedule 4566, to Joseph T. Ryerson & Son Inc., Chicago.
- 200 tons, Simmons Co. factory, Elizabeth, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; White Construction Co., contractor.
- 170 tons, housing project, Danville, Ill., J. W. Montgomery, Danville, Ill., contractor, to Sheffield Steel Co., Kansas City, Mo.
- 136 tons, state highway project No. 364, Jackson county, Ohio, to West Virginia Rail Co., Huntington, W. Va.; Ralph Meyers Construction Co., contractor.
- 120 tons, expanded steel mesh, U. S. engineer, Providence, R. I., to Consolidated Expanded Metal Co., Somerville, Mass., \$7860, Inv. 106; bids Nov. 27.
- 110 tons, Business Institute building, Milwaukee, Selzer Construction Co., Milwaukee, to Frank A. Pipkorn Co., Milwaukee.
- 107 tons, engine test building and facil-

ties, Hill field, Ogden, Utah, to Steel-Engineers Inc., Salt Lake City; Mead & Mount Construction Co., Denver, contractor.

100 tons, state highway project FAP 121-G, New Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Alexander Jarvis, contractor.

100 tons, bars and mesh, housing project, Key West, to Connors Steel Co., Birmingham, Ala., through Paul H. Smith Construction Co., Miami, contractor.

Reinforcing Steel Pending

- 2737 tons, toll bridge, Thames river, New London, Conn.; bids Dec. 23.
- 2000 tons, Curtiss-Wright Co. factory, St. Charles, Mo.; H. B. Deal Co., St. Louis, low.
- 1922 tons, bars and mesh, bridges and highways, five contracts in New Jersey; bids Dec. 27 and Dec. 30, Trenton, N. J.
- 1200 tons, elevated highway sections, Brooklyn, N. Y., contracts B-9 and B-16; bids Dec. 17, to triborough bridge authority, New York.
- 800 tons, seven quartermaster depot buildings, navy yard, Philadelphia, Wark & Co., contractors.
- 800 tons, Hamilton avenue bridge, Gowanus canal, Brooklyn, N. Y., P. T. Cox Construction Co., New York, low, \$1,910,501, bids Dec. 10.
- 550 tons, elevated parkway, B-16, Brooklyn, N. Y.; bids Dec. 17.
- 500 tons, Hill field warehouse, Ogden, Utah.
- 400 tons, Clason Point housing project, New York; bids Dec. 20.
- 320 tons, pier replacement and other work at Puget Sound navy yard, Washington; Dally Construction Co. and A. W. Quist Co., Seattle, joint low bidders.
- 300 tons, bridge, Bluff City, Va.
- 300 tons, Norton housing project, Barber-ton, O.; bids Dec. 11.
- 287 tons, Wisconsin-Minnesota highway bridge 5900, over main channel, Winona, Minn.; bids Wisconsin project Dec. 10, Minnesota, Dec. 13.
- 250 tons, Farmers-Merchants bank, Minneapolis; bids Dec. 14.
- 250 tons, addition to Fisk street station, Commonwealth Edison Co., Chicago; bids Dec. 9.
- 220 tons, grade separation, B-8, Prospect avenue, Brooklyn, N. Y.; bids Dec. 17.
- 208 tons, bridge, route 25, sec. 33-A, Middlesex county, New Jersey; bids Dec. 30.
- 200 tons, pumping station, Harrisburg, Ill.
- 180 tons, Elliott street viaduct, Peoria, Ill.
- 170 tons, bridge at Clayton and Warsaw roads, St. Louis county, Missouri; Blackwell Corp., East St. Louis, Ill., low.
- 163 tons, coal handling machine foundation, Fisk street station, Commonwealth Edison Co., Chicago.
- 150 tons, Danley Mfg. Co. building, Cicero, Ill.
- 135 tons, grade crossing, Woodhaven boulevard, Brooklyn, N. Y., Poirier & McLane Corp., low.
- 111 tons, highway bridge Lindbergh boulevard, St. Louis county; Atkinson-Windle Co., Chillicothe, Mo., low.
- 100 tons, grade crossing elimination, Berlin, N. J.
- 100 tons, addition to Mt. Sinai hospital, Chicago; bids Nov. 29.
- Unstated, Oregon state highway projects in Multnomah and Grant counties; bids at Portland, Dec. 17-18.

Concrete Bars Compared

	Tons
Week ended Dec. 14	5,261
Week ended Dec. 7	9,286
Week ended Nov. 30	18,077
This week, 1939	3,348
Weekly average, year, 1940	9,762
Weekly average, 1939	9,197
Weekly average, Nov.	11,748
Total to date, 1939	466,551
Total to date, 1940	488,086
Includes awards of 100 tons or more.	

Pig Iron

Pig Iron Prices, Page 92

Pittsburgh—Market conditions last week were chaotic and at the close of the week showed no signs of becoming clarified. No producer has announced definite first-quarter prices for the Pittsburgh district, although the action was expected before the end of the week. Opinion is divided as to the amount of the increase, if any, for first-quarter iron deliveries.

Cleveland—Interlake Iron Corp. advanced prices \$1 per ton early last week and has sold several thousand tons, in as many as six states. Some producers are out of market. The immediate future is uncertain. Consumers take the price advance calmly and in surprisingly few instances have tried to cover before advances become general. December shipments are about the same as in November.

Chicago—A confused price situation exists in the pig iron market here. The advance of \$1 a ton on all grades for delivery to April 1, made effective by the leading seller Dec. 10, apparently was unexpected in the trade. This seller is understood to have taken substantial orders at the new price. At the moment, no other sellers have made announcement or are known to have booked business at the higher price.

Boston—Producers are booking limited tonnage for first quarter but are not soliciting tonnage at open prices. Not all offered business is being accepted but actual needs are covered. Foundry consumption is heavy and the melt based on a 44-hour week is practically 100 per cent.

New York—At the moment most local sellers of pig iron are in the dark as to price policies for next quarter. One seller is quoting at unchanged levels on such tonnage as is available for shipment in the east, and another is said to have booked a limited tonnage, with policy subject to change at any time. In most cases local selling agents are not too concerned because of lack of information as to first quarter prices.

Philadelphia—Pig iron sellers are awaiting clarification of first quarter prices before naming a definite market, meanwhile accepting business at prices prevailing at time of shipment. Most large consumers are well covered on forward needs but some express concern over inability to place desired tonnages. Foundry operations are tending upward, the majority of plants running full on a five-day-week basis.

Buffalo—Producers are confused over first quarter pig iron prices, but are building backlogs for next year delivery on the basis of prices

prevailing at the time of shipment. Current shipments are brisk with tonnage for the closing quarter expected to run 10 to 20 per cent greater than the previous three months.

Cincinnati—First quarter policies of pig iron producers are not yet defined. Further delay before opening of books for next quarter may result from desire to learn how much tonnage will be available, and prospective costs. Shipments are heavier than in November, cutting estimates of carryover. A district furnace, scheduled for a switch to merchant iron, will continue several weeks on basic for stock.

St. Louis—Pig iron shipments continue to mount and there is every indication that the December total will be the largest of the year by a liberal margin. Some small lots of special analysis have been booked for prompt shipment, mainly by interests which had underestimated requirements earlier in the year.

Iron Ore

Iron Ore Prices, Page 94

Cleveland—A total of 8685 gross tons of iron ore were shipped from United States upper lake ports in December, according to the Lake Su-

perior Iron Ore association, a figure which had originally erroneously been included with November shipments. In addition 5862 tons were shipped in December from Michipicoten, a total of 14,547 tons, which makes the grand total for the 1940 season 63,712,982 tons, as against 45,073,052 tons in 1939, an increase of 41.35 per cent.

Scrap

Scrap Prices, Page 94

Pittsburgh—No. 1 railroad heavy melting steel again has increased 50 cents to \$23.50 top, and the market generally was stronger through all grades. Buying has been active and heavy tonnage has changed hands on trade deals involving principally open-hearth grades.

Cleveland—Increasing strength in scrap prices has resulted in a sharp advance in quotations, from 50 cents per ton on steelmaking grades to \$3.50 for low phosphorus grades. Dealers are buying for contracts at losses in many cases. Prices in the Valley have advanced 50 cents per ton.

Chicago—In spite of extremely limited mill buying and little trading, the scrap market here maintains a firm tone. No. 1 heavy melt-

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conforms exactly to government specifications. • Complete paper stocks of anti-tarnish tissues, waxed and oiled papers, special grades, waterproof papers, plain, creped, string inserted and burlap lined, ready for immediate shipment.

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RACK INSULATING COATING STILL OKAY AFTER 11 MONTHS

"UNICHROME"* RACK-COATING-W
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Says User

NEW YORK, DECEMBER 16.—Plating shops continue to enthuse about the remarkably long-lasting rack-insulating material, "UNICHROME"* Rack-Coating-W, developed by United Chromium. From platers everywhere come reports testifying to the ability of "UNICHROME"* Rack-Coating-W to withstand long service in any plating solution.

"Finest rack-insulating material we've ever come across", say many. "Completely satisfactory. Racks in perfect condition!"—"Rack used 1,000 hours, still serviceable!" others write. Experience of leading plating plants conclusively proves that "UNICHROME"* Rack-Coating-W definitely offers these outstanding advantages:

1. Withstands boiling cleaners and all plating solutions
2. Tough—withstands wear and tear of handling
3. Contains no ingredients harmful to plating solutions
4. Cuts costs—reduces frequency of recoatings
5. Easy to apply—"dip and force dry" method
6. Light in color—easy to see how well the rack is covered
7. Any part of rack can be recoated without recoating entire rack.

Write for Bulletin No. 20
Containing Complete Information—

Platers without rack coating facilities may have their racks coated with "Unichrome"* Rack-Coating-W by Chromium Corporation of America, 4645 West Chicago Avenue, Chicago, Ill.; Belke Manufacturing Company, 947 North Cicero Avenue, Chicago, Ill.; or Lea Manufacturing Co., Waterbury, Conn.

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ing steel moved up 25 cents a ton, to \$20.50 to \$21, on the strength of a small mill sale at the top figure. Several other grades advanced proportionately.

Boston—Scrap demand and consumption are strong and shipments are substantial by barge to Baltimore and rail to various Pennsylvania points. Export activity is light. Prices tend upward on several grades and supplies of cast and stove plate are limited. No. 2 cast for export also is scarce.

Philadelphia—Several grades have advanced further, although principal steelmaking items hold at levels prevailing for almost 90 days. Additional sales of No. 1 steel have been made within the current range of \$20.50 to \$21.

Buffalo—Strength dominates, but agitation for higher prices is not supported by sales of consequence. Dealers favoring a price boost report paying within the prevailing range of \$21.50 to \$22 a ton for No. 1 heavy melting. An embargo in effect at one mill has been lifted a week earlier than expected.

Detroit—Trading in scrap is listless, but prices are basically strong. This is attributed to concern over Washington policies and unwillingness of dealers to take chances with prices high. Widespread lack of interest in both buying and selling is apparent. Break in the bad weather has avoided any bullish movement which often accompanies congestion of shipments.

Cincinnati—Dealers' prices on iron and steel scrap have moved higher in the quest for tonnage to meet heavy steelmaking demand. The new prices have tapped sufficient material for the present. Foundry grades are especially active, with dealers aggressive for all heavy scrap. Malleable is comparatively dull.

St. Louis—No. 2 heavy melting steel for St. Louis delivery has been advanced 25 cents per ton to \$17.25 to \$17.75. An East side mill has purchased a round tonnage of heavy melting steel on a basis of the latest quotations.

Warehouse

Warehouse Prices, Page 93

Cleveland—Chief problem is replenishing stocks requiring eight to twelve weeks to get in new deliveries from mills. Retailers have not been able to ration among customers to the same extent as mills.

Philadelphia—No price changes on steel warehouse products are in prospect for next month. Business continues brisk as urgency for delivery and delays in mill shipments combine to hold warehouse volume at an unusually high level for this period.

Chicago—Warehouse sales show

no signs of lessening, although it is believed some easing will be felt later in the month. Volume of business is well above that of a year ago, and exceptionally well diversified. Strongest warehouse demand is for bars, particularly alloy grades.

Cincinnati—Jobbers' sales are undiminished. Difficulty in maintaining stocks, especially structurals, is being intensified. Demand for building materials reflects shop extensions and desire for speedier delivery than can be had from customary sources.

St. Louis—December warehouse sales are running ahead of the same period in November. Building material is moving actively, especially shapes and tubular goods.

Steel in Europe

Foreign Steel Prices, Page 93

London — (By Cable) — Light foundries in Great Britain are busier, causing greater demand for foundry grades of pig iron. Scrap is being used more extensively in replacement. Steelworks are fully active, mainly on war contracts, including materials for shipbuilding. Many uncompleted ordinary commercial contracts are being carried over to next year, subject to government priority orders. The domestic market absorbs practically all sheet and galvanized sheet production. Some export tonnage is available from mills in Scotland. Tin plate export demand from the Dominions and South America is reviving.

To Re-Open Leased Dearth Coke Plant

■ Dearth coke plant of the H. C. Frick Coke Co., Pittsburgh, has been leased to Frank Crow Jr. and Lawrence Parshall, both of Uniontown, Pa., in co-operation with Wieman & Ward Co., Pittsburgh. Latter will act as sales agent.

Located in the Connellsville district of Pennsylvania, the Dearth ovens, inactive many months, are being rehabilitated and the plant prepared for operation, according to C. S. B. Ward, president, Wieman & Ward Co. When fully modernized the plant will have an annual capacity of 200,000 tons of low phosphorus, low sulphur beehive coke, said Mr. Ward. Plant's initial output has been contracted for defense needs.

British Coke Reaching New England Market

Boston — Increasing arrivals of British coke are believed the forerunner of still larger shipments.

The movement provides westbound cargo for ships to load war materials for England. Proceeds of coke sales increase British credits in this country. Desirability of an outlet here is increased by the fact that Scandinavia and other European countries now cut off formerly took large tonnages from Britain. Heavy demand for coke here opens the way for this movement.

While present shipments are believed to be chiefly for domestic use, they release coke oven capacity for production of metallurgical grades.

Nonferrous Metals

New York — Heavy buying of nonferrous metals continued orderly last week, turnover being restricted only by the amount of available metal.

Copper — Casting copper moved ½-cent above the previous week's level to the basis of 12.12½c, f.o.b. refinery, as the flow of red metal scrap tapered. Mine producers continued to allocate sales at 12.00c, Connecticut, while brokers asked 12.50c for first quarter and 12.37½c for second quarter delivery. Export copper advanced to the closing range of 10.25c to 11.50c, f.a.s. New York, the lower level being for delivery in March. Refined stocks dropped 6200 tons during November to 158,418 tons as apparent consumption remained heavy at 102,483 tons.

Lead — Producers balanced their intakes on sales at the 5.35c, East St. Louis, and 5.50c, New York, levels.

Zinc — With the galvanizing rate at 83 per cent consumers continued to take all metal offered. Stringency of supplies remained a serious problem but producers held prime western at 7.25c, East St. Louis.

Tin—Bookings were the heaviest in weeks as Straits tin settled to 50.05c, New York, the level at which Metals Reserve Co. absorbs all excess offerings. Heavy arrivals continue to build up reserve stocks in this country.

Steel Corp. Shipments off 9.4 Per Cent in November

Shipments of finished steel products by the United States Steel Corp. in November totaled 1,425,352 net tons. This was 147,056 tons, or 9.4 per cent, less than October shipments of 1,572,408 tons, but 19,147 tons more than 1,406,205 tons shipped in November, 1939. For eleven months, 1940, shipments were 13,431,487 tons, against 10,308,147 tons in the corresponding period of 1939. November shipments were third highest this year. One less working day and some loss on Thanksgiving day accounted for most of the decline.

Nonferrous Metal Prices

Dec.	Copper		Straits Tin, New York	Lead	Lead East	Zinc	Alumi- num	Anti- mony Amer.	Nickel Cath-		
	Electro, del.	Lake, del.								Casting,	
7	12.00	12.00	11.87½	50.10	50.05	5.50	5.35	7.25	17.00	14.00	35.00
9	12.00	12.00	11.87½	50.10	50.05	5.50	5.35	7.25	17.00	14.00	35.00
10	12.00	12.00	11.87½	50.10	50.05	5.50	5.35	7.25	17.00	14.00	35.00
11	12.00	12.00	12.12½	50.05	50.05	5.50	5.35	7.25	17.00	14.00	35.00
12	12.00	12.00	12.12½	50.05	50.05	5.50	5.35	7.25	17.00	14.00	35.00
13	12.00	12.00	12.12½	50.05	50.05	5.50	5.35	7.25	17.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets	
Yellow brass (high)	19.23
Copper, hot rolled	20.62
Lead, cut to jobbers	8.75
Zinc, 100 lb. base	12.50

Tubes	
High yellow brass	21.98
Seamless copper	21.12

Rods	
High yellow brass	14.76
Copper, hot rolled	17.12

Anodes	
Copper, untrimmed	17.87

Wire	
Yellow brass (high)	19.48

OLD METALS

Nom. Dealers' Buying Prices No. 1 Composition Red Brass

New York	8.00-8.25
Cleveland	8.62½-9.12½
Chicago	8.25-8.50
St. Louis	8.37½

Heavy Copper and Wire

New York, No. 1	9.62½-9.87½
Cleveland, No. 1	9.37½-9.87½
Chicago, No. 1	9.62½-9.87½
St. Louis	9.37½-9.50

Composition Brass Turnings

New York	7.62½-7.87½
----------	-------------

Light Copper

New York	7.62½-7.87½
Cleveland	7.37½-7.87½
Chicago	7.62½-7.87½
St. Louis	7.37½-7.50

Light Brass

Cleveland	4.12½-4.37½
Chicago	5.50-5.75
St. Louis	4.87½

Lead

New York	4.60-4.70
Cleveland	4.00-4.25
Chicago	4.50-5.00
St. Louis	4.00-4.25

Zinc

New York	5.25-5.50
Cleveland	3.25-3.50
St. Louis	3.50-3.75

Aluminum

Mis., cast, Cleveland	9.25-9.50
Borings, Cleveland	6.50
Clips, soft, Cleveland	14.25
Misc. cast, St. Louis	7.75-8.00

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.25
Standard No. 12 aluminum	15.00-15.50

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Important Advances In Emergency Probable

(Concluded from Page 25)

for a bomber to attack with any effectiveness any large city.

"Defense against the airplane must be made as effective as a land battery is against a battleship. Thus far we have fortified ourselves with walls, omitting the roof. We have safeguarded against horizontal attacks but have not sufficiently provided against perpendicular attacks."

■ IN DISCUSSING the problem of



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NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

supply of labor for the defense program, Clifford S. Stilwell, vice president, Warner & Swasey Co., Cleveland, commented on the tremendous increase in labor requirements since the World war. The best figures, he said, have to do with Germany. They show that in the World war two productive civilians were involved for each man in military service. At present 18 productive civilians are at work in support of each man in active military duty.

In the United States approximately four productive civilians were engaged in support of each man in military service. Should we be called upon to match the productivity of the German war program a difficult chore confronts us in supplying the required workers. Recent experience, however, proves that it can be done through sound training systems.

"I listened some months ago to an interesting example of totalitarian efficiency," said Mr. Stilwell. "Germany found an inadequate supply of skilled technicians for many delicate operations involved in her tremendous aircraft program. The suggestion came that barbers were accustomed to sensitive manual work and an immediate survey of the nation's barbers ensued. Presumably sufficient practitioners were unmolested so that the nation could still be shaved, but several thousand barbers were diverted into aircraft trade schools to fill the shortage."

■ VAST strides forward have been made by the association in public relations work. Pledged to assist actively in the association's "Mobilization for the Understanding of Private Enterprise" this year are 8018 business men located in 1494 communities.

This work involves furnishing speakers for meetings. Association members or employes delivered 2227 speeches at 1926 meetings this year. Ninety conferences between clergymen and local groups of manufacturers have been held in the same period. The association broadcasts this year have consumed 7986 hours.

Much work has been done in schools and now in prospect are conferences between educators and local groups of manufacturers. The association has furnished to its members abstracts of approximately 800 textbooks—nearly 90 per cent of those used in schools all over the country. The purpose is to inform manufacturers as to the type of books from which our youth are deriving their impressions.

The manufacturers by resolution declared the Great Lakes-St. Lawrence waterway and power project should be opposed because "un-

economical and unwise in times of peace" and because instead of contributing to our defenses its construction would obstruct the defense program.

Chief speaker at the annual banquet Friday night was William S. Knudsen, who reviewed the defense contracts placed to date and described how industry is meeting the challenge of getting this business into production.

Officers Elected

Walter D. Fuller, president, Curtis Publishing Co., Philadelphia, was elected president of the association for 1941. Outgoing president, H. W. Prentis Jr., president,



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GARAGE IN CONNECTION

Armstrong Cork Co., Lancaster, Pa., will be chairman of the association's board of directors, and Howard Coonley, president, Walworth Co., New York, will be chairman of the executive committee.

Robert E. Wood, chairman, Sears, Roebuck & Co., Chicago; Philip D. Reed, chairman, General Electric Co., Schenectady, N. Y.; and J. Howard Pew, president, Sun Oil Co., Philadelphia, were elected national vice presidents. Twelve regional vice presidents were also elected and included: H. A. Bullis, executive vice president, General Mills Inc., Minneapolis; Thurmond Chatham, president, Chatham Mfg. Co., Winston-Salem, N. C.; S. Bayard Colgate, chairman, Colgate-Palmolive-Peet Co., Jersey City, N. J.; C. S. Davis, president, Borg-Warner Corp., Chicago; Lamot du Pont, chairman, E. I. du Pont de Nemours & Co., Wilmington, Del.; W. T. Holliday, president, Standard Oil Co. of Ohio, Cleveland; Craig R. Sheaffer, president, W. A. Sheaffer Pen Co., Ft. Madison, Iowa; H. C. Stockham, president, Stockham Pipe Fittings Co., Birmingham, Ala.; John Suman, vice president, Humble Oil & Refining Co., Houston, Tex.; Sinclair Weeks, president, Reed & Baron Corp., Taunton, Mass.; J. D. Zellerbach, president, Crown-Zellerbach Corp., San Francisco; and Thomas McCable, president, Scott Paper Co., Chester, Pa.

Group Chairmen Elected

Group chairmen for the National Industrial council, which is sponsored by the National Association of Manufacturers, were elected as follows:

National manufacturing trade group: Chairman, V. P. Ahearn, secretary, National Sand and Gravel association, Washington; vice chairman, Harry B. Lindsay, Grinding Wheel Manufacturers' association, Worcester, Mass.

State associations group: Chairman, Roy P. Williams, general manager, Associated Industries of Massachusetts, Boston; vice chairman, E. A. Kimball, Iowa Manufacturers' association.

Industrial relations group: Chairman, Col. William Frew Long, general manager, Associated Industries of Cleveland; vice chairman, A. E. McClintock, National Founders' association, Chicago.

Steel's Hourly Wage Reaches New Peak

■ Highest in the steel industry's history, current wages also are among highest paid by any manufacturing industry in United States, according to American Iron and Steel institute, New York. Workers in only six of approximately 90

industries surveyed by government agencies are receiving higher average hourly wages than are steel employes. The six include: Automobile, beverage, newspaper printing, petroleum refining, rubber tire and shipbuilding industries.

Steel workers' earnings since May have averaged 85.5 cents per hour, compared with the previous peak of 84.2 cents per hour earned in 1939. Former rate is 30 per cent greater than the 1929 averages of 65.4 cents per hour.

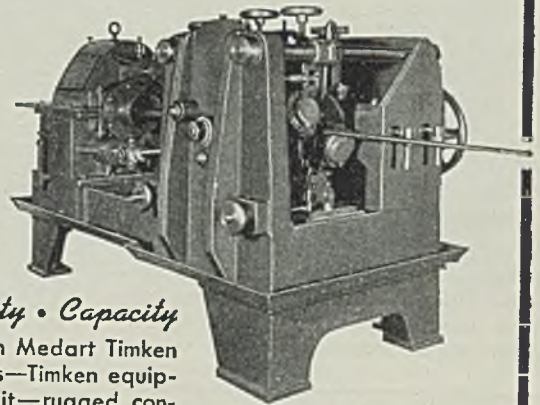
Hourly earnings of steel indus-

try's wage earners are 28 per cent higher than the average hourly rate in all manufacturing industries as reported by the department of labor. Average hourly earnings, since May, of workers in all manufacturing industries are reported to be 67 cents.

■ Purcell-Evans Tool Co., which began operations in Hillsdale, Mich., last July, has changed its name to Hillsdale Tool & Mfg. Co. Robert J. Simpson is president. He succeeds Frank Rubisch, resigned.

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Construction and Enterprise

Ohio

BELLEVUE, O.—General Electric Co., Schenectady, N. Y., plans erection of a plant here for manufacture of incandescent light bulbs. The plant, to be ready early next year, will employ approximately 100 workers.

CANTON, O.—Timken Roller Bearing Co. will spend about \$551,000 for erection of new melting shop, to house 60-ton electric furnace and auxiliary equipment. Walter Assel is in charge of steel mill engineering department.

CLEVELAND—Construction bids for first two units of the \$8,400,000 airplane engine laboratory at Cleveland airport will be opened this month by national advisory committee for aeronautics at Langley field, Hampton, Va.

CLEVELAND—Murray-Ohio Mfg. Co., 1115 East 152nd street, will erect a 1-story addition, 60 x 100 feet, to its warehouse.

CINCINNATI—Aluminum Industries Inc. has started construction of a new plant unit containing 150,000 square feet of floor space. This unit, the first of several to be built, will be utilized as a

■ **Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 102 and Reinforcing Bars Pending on page 104 of this issue.**

foundry. Construction of other units, consisting of shops for machine operations with 300,000 square feet of space, and a new general office building, will follow immediately. Austin Co. has been awarded contract.

CINCINNATI—R. K. LeBlond Machine Tool Co., Madison and Edwards roads, has let contract for one-story 100 x 500-

foot factory to Ferro Concrete Construction Co., Third and Elm streets. Cost \$100,000. Rapp & Meacham, Times-Star building, architects.

DAYTON, O.—Frigidaire division, General Motors Corp., has taken bids on superstructure of five-story building for manufacture of machine guns for the government. Total cost estimated between \$400,000 and \$450,000. Schenck & Williams, Dayton, architects.

DAYTON, O.—Delco products division, General Motors Corp., has begun construction of a \$500,000 addition to building No. 6.

DAYTON, O.—Inland Mfg. Co., 2727 Inland avenue, will soon let contract for rebuilding two-story factory. Argonaut Realty Co., division of General Motors Corp., Detroit, architect.

DAYTON, O.—Sheffield Gage Corp., 1517 East Third street, has plans by J. D. Lorenz, 330 West First street, for steel factory. Estimated cost \$175,000.

DEFIANCE, O.—Emil L. Herbolshelmer and Harold F. Hadley, former president and vice president, respectively, Defiance Pressed Steel Co., which moved to Marion, O., after fire destroyed the plant in Defiance in 1936, plan to organize a new corporation and build a factory here. The new firm, capitalized by \$25,000 with 250 no par shares, will make die castings for caskets, air compressors for spray guns and pneumatic tools. J. W. Houston will be associated with Messrs. Herbolshelmer and Hadley.

DOVER, O.—Shenango-Penn Mold Co., West Third street, has begun expansion of foundry to cost \$30,000. J. P. Jeffries is general manager. Wendling Bros., 933 Worcester avenue, Dover, is contractor.

ELYRIA, O.—Fox Furnace division of American Radiator Co., Woodford avenue, will increase plant space with new one-story building, about 100 x 400 feet.

Main office of company is in Pittsburgh.

LEBANON, O.—Bids were opened Dec. 10 for power plant addition, cooling lower basin and five-ton overhead traveling crane. Froelich & Emery Engineering Co., 410 Second National Bank building, Toledo, O., engineer.

PAINESVILLE, O.—Premier Bronze Powder Co., East Erie avenue, affiliated with Ohio Bronze Powder Co., 1120 East 152nd street, Cleveland, will increase plant facilities with erection of storage and mill building, costing \$40,000. Contracts will be let about Jan. 15 on plans by E. G. Hoefler, 5005 Euclid avenue, Cleveland.

RAVENNA, O.—Jennings & Lawrence Co., 12 North Third street, Columbus, O., is preparing plans for new \$4,000,000 storage plant for guns, powder, etc., to be erected by United States war department near the \$14,000,000 shell loading plant in this vicinity. Construction will begin after March when plans are expected to be ready for contractor's bids.

TOLEDO, O.—Champion Spark Plug Co. will build a two-story plant to house production of its newly developed ceramic-type aircraft spark plug.

WARREN, O.—Taylor-Winfield Corp. is erecting a plant addition to cost \$9000.

Maine

AUGUSTA, ME.—Central Maine Power Co., W. S. Wyman, president, will construct a 27,000-horsepower steam generating electric power plant, costing over \$40,000.

Massachusetts

BOSTON—Kendall Taylor & Co., architects, 221 Columbus avenue, have awarded contract to S. J. Sullivan Co., 83 Newburg street, Roslindale, Mass., for two-story, 54 x 74-foot steel power house. Cost approximately \$125,000 including equipment.

LYNN, MASS.—Hoague-Sprague Corp., H. M. Hoague, president, opened bids Dec. 10 on general contract for one-story, 72 x 195-foot box manufacturing plant. Cost \$40,000 with equipment.

PITTSFIELD, MASS.—General Electric Co., M. M. Thrane, chief engineer, has let contract for one-story 75 x 175-foot steel transformer building addition to Lindholm Construction Co., 1277 East street. Cost estimated at \$150,000.

Rhode Island

PROVIDENCE, R. I.—Morris Machine & Tool Co., 229 Globe street, has been incorporated with 250 shares common, no par value, by Walter F. Morris, Cranston, R. I.; Samuel B. White, Providence, and James F. Armstrong, North Providence, to manufacture tools and general machine work.

New York

BROOKLYN, N. Y.—E. W. Bliss Co., Fifty-third street and Second avenue, has let contract to James King & Sons Inc., 9 Rockefeller plaza, New York, for altering and constructing plant addition. Cost over \$40,000.

New Jersey

BOUND BROOK, N. J.—Calco Chemical Co. Inc., Bound Brook, and American Cyanamid & Chemical Corp., 30 Rockefeller plaza, New York, plan three-story, 50 x 50-foot plant. R. DeCosta Green, Bound Brook, care of owner, engineer.

CAMDEN, N. J.—Camden Forge Co. is erecting a machine and forge shop build-



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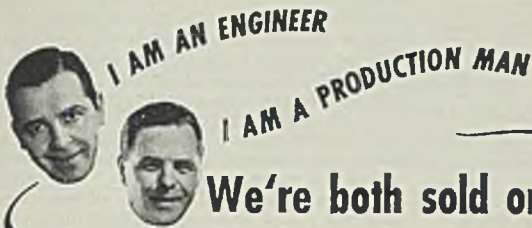
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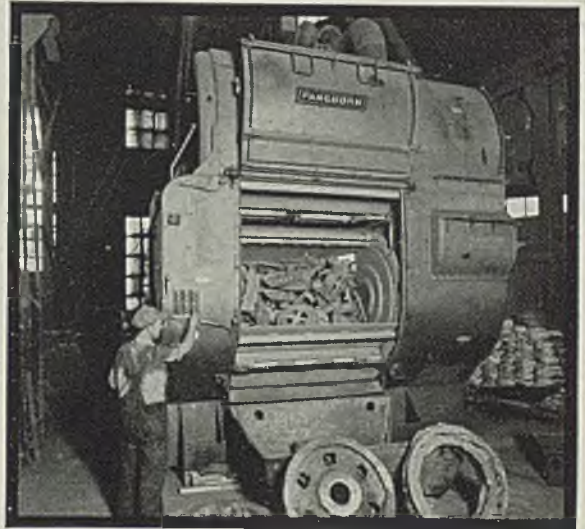
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ing, 75 x 800 feet, to cost approximately \$251,000.

NEWARK, N. J.—P. Ballentine & Sons, 57 Freeman street, opened bids Dec. 10 for two-story bottling plant, costing about \$100,000. J. S. Shanley, 33 Washington street, architect.

SOUTH AMBOY, N. J.—Seaboard Coal Dock Co., D. W. Reed Sr., superintendent, has under way improvement of existing equipment and installation of new equipment at its plant. A machine shop 50 x 100 feet will also be constructed.

Pennsylvania

ELLWOOD CITY, PA.—Preliminary surveys are under way for new municipal light plant to include generating equipment, building, and appurtenances. L. W. Monroe is city manager. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is making the survey.

Michigan

ADRIAN, MICH.—Stubnitz-Green Spring Corp., Adrian, has awarded contract to Robb-Ott Builders, Adrian, for 80 x 200-foot addition to factory.

BELDING, MICH.—Extruded Metals Inc., Belding, has let contract for \$100,000 addition to plant to Barnes Construction Co., Grand Rapids, Mich.

DEARBORN, MICH.—Plans have been completed by Giffels & Vallet Inc., L. Rossetti, Detroit, architects, for an eight-bay extension to Ford Motor Co.'s cold mill here.

DETROIT—Revere Copper & Brass Inc. has let contract for a mechanical building in Detroit to Barton-Malow Co., Detroit. Johnck & Ehmann, Chicago, architects.

DETROIT—George Machinery Co., East Jefferson avenue, has let contract to Louis Cantor, Detroit, for addition to factory.

HASTINGS, MICH.—E. W. Bliss Co., maker of presses and metalworking machinery, is expanding its plant to provide facilities for national defense production. The addition, comprising about 150,000 square feet, will enlarge the machine shop about 25 per cent when completed in March.

HOWELL, MICH.—Howell Electric Motors Co. will erect an 80 x 130-foot addition to its plant. Giffels & Vallet Inc., L. Rossetti, Detroit, architects.

MARQUETTE, MICH.—City, M. A. Hogan, clerk, plans construction of sewage disposal plant, pumping stations, etc. Shoecraft, Drury & McNamee, Ann Arbor, Mich., consulting engineers.

SOUTH HAVEN, MICH.—Black River Foundry has awarded contract for \$90,000 foundry building to Kriehoff Co., Detroit. Buckhelt & Stuchell, Detroit, architects. (Noted Dec. 2.)

WAYNE, MICH.—Bendix Aviation Corp. has awarded contract to Bryant & Detwiler Co., Detroit, for rehabilitation of factory here. Argonaut Realty Co., Detroit, architects.

Illinois

CHICAGO—R. G. Haskins Co., 615 South California avenue, has started construction of a one-story brick addition, 50 x 170 feet. Cost about \$20,000.

JOLIET, ILL.—Public Service Co. of Northern Illinois, 72 West Adams street, Chicago, awarded contract to Powers-Thompson Construction Co., 27 South Chicago avenue, Joliet, for superstructure for power plant. Total cost \$750,000. Sargent & Lundy, 140 South Dearborn street, Chicago, engineers.

MOLINE, ILL.—Montgomery Elevator Co. will soon let contracts for a factory addition, 90 x 103 feet. William H. Schulzke is architect.

PERU, ILL.—Westclox division of General Time Instruments Corp., LaSalle, Ill., has awarded contract to V. Jobst & Sons, Peoria, Ill., for erection of a 1-story building at Peru, to replace the original 3-story factory building which is to be razed.

ROXANA, ILL.—Plans for construction of a solvent extraction plant at the Shell Oil Co. refinery here have been announced by R. C. Roberts, manager. Estimated cost \$550,000.

SAVANNA, ILL.—War department has awarded contract for diesel electric generating plant at the Savanna ordnance depot, Proving Ground, Ill., to Chicago Pneumatic Tool Co., 3655 South Iron street, Chicago, at \$238,383.

Kentucky

LOUISVILLE, KY.—Frank Knox, secretary of the navy, has announced that site of 135 acres has been selected near Louisville on Ohio river for a new \$5,000,000 naval gun equipment plant, to be built and operated for the government by Westinghouse Electric & Mfg. Co. under a lease arrangement. Present plans include construction of main manufacturing buildings, office, and heating plant and service building.

PINEVILLE, KY.—Cumberland Valley Rural Electric Co-operative Corp., J. W. Moffett, co-ordinator, will take bids soon on construction of about 276 miles of rural electric lines in Bell, Harlan, Knox, Letcher and Whitney counties, for which REA has allotted \$295,000. Ray W. Chanaberry Co. Inc., Louisville, Ky., consulting engineer.

Missouri

CARROLLTON, MO.—City, Harold M. Austin, mayor, will take bids soon on first unit in improvement of municipal power plant, consisting of diesel engine, cooling tower and switchgear. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineer.

HAYTI, MO.—Pemiscol-Dunklin electric co-operative, Glenn Eaker, project superintendent, has retained Ray W. Chanaberry Inc., Louisville, Ky., to prepare plans and specifications for about 145 miles of rural electric lines in Pemiscol, New Madrid and Dunklin counties, Missouri. REA has allotted \$100,000.

KANSAS CITY, MO.—City, K. K. King, director of water department, has employed Burns & McDonnell, 107 West Linwood boulevard, Kansas City, as consulting engineers to prepare plans for water softener plant.

MT. VERNON, MO.—Inland Construction Co., Omaha, Nebr., was low at \$161,218 for construction of 252 miles of lines to serve 764 customers of Ozark electric co-operative, S. E. Roberts, superintendent. Frank Horton, Lamar, Mo., consulting engineer.

ST. LOUIS—Western Cartridge Co., East Alton, Ill., will operate a small arms ammunition plant to be erected at Bircher and Goodfellow boulevard by the war department. Estimated cost \$8,000,000.

ST. LOUIS—Continental Can Co., W. W. Taylor, manager, construction division, 4633 West Grand avenue, Chicago, opened bids Dec. 16 for factory, office and warehouse at Broadway and Humboldt street, St. Louis. (Noted Oct. 28.)

STOCKTON, MO.—Sac-Osage electric co-operative, H. C. Cowan, president, will take bids soon on construction of about 158 miles of rural electric lines in Cedar, Dade and Vernon counties, Missouri. REA has allotted \$152,000 for this project. Frank Horton & Co., Lamar, Mo., consulting engineer.

Wisconsin

ARGYLE, WIS.—Village, J. R. Arnot, clerk, is drawing plans and will apply to WPA for funds for construction of sewage treatment plant to cost \$96,501. W. G. Kirchoffer, 22 North Carroll street, Madison, Wis., consulting engineer.

MADISON, WIS.—Mautz Paint & Varnish Co. has let contract to George Nelson for construction of one-story factory addition. Law, Law & Potter are architects.

MENOMONIE, WIS.—WPA has allotted \$39,102 to city, Alice Kenney, clerk, to aid financing construction of sewage disposal plant to cost \$60,000. S. P. Hall,



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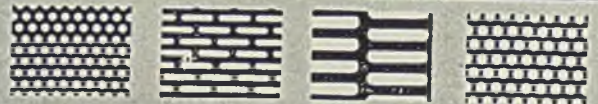
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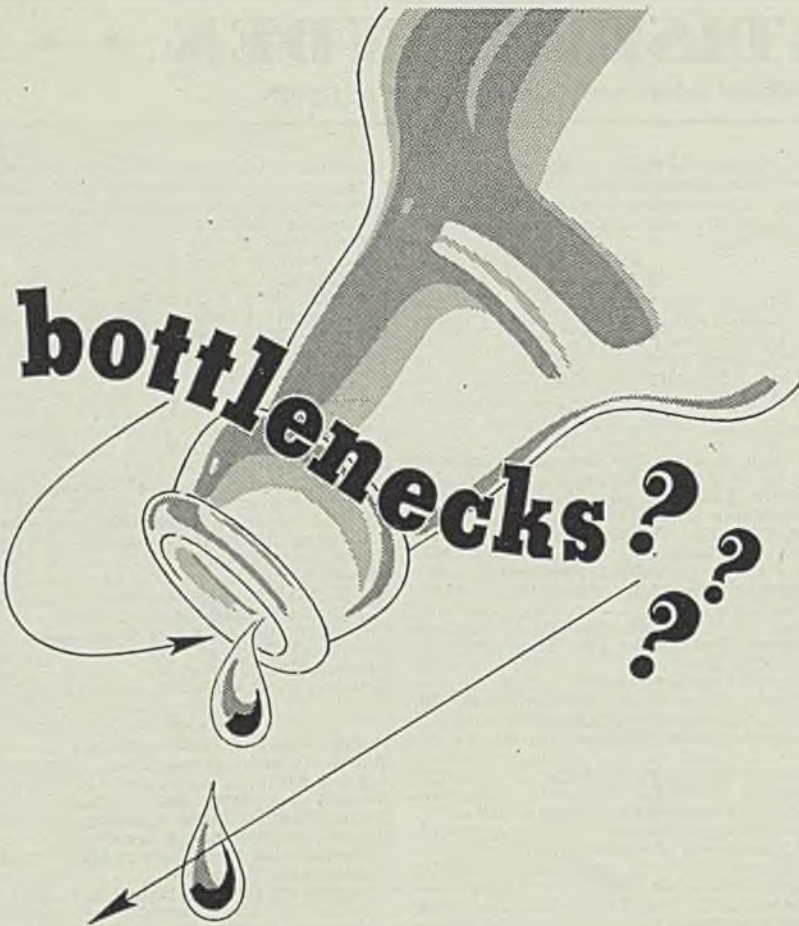
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