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Westminster, S.W. 1

Published by THE PENTON PUBLISHING CO.,  
Penton Building, Cleveland, Ohio. E. L. SHANER,  
President and Treasurer; G. O. HAYS, Vice  
President; F. G. STEINEBACH, Secretary.  
Member, Audit Bureau of Circulations; Associated  
Business Papers Inc., and National Publishers'  
Association.

Published every Monday. Subscription in the  
United States, Cuba, Mexico and Canada, one  
year \$4, two years \$6; European and foreign  
countries, one year \$10. Single copies (current  
issues) 25c.

Entered as second class matter at the postoffice  
at Cleveland, under the Act of March 3, 1879  
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# STEEL

ESTABLISHED 1882

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PRODUCTION • PROCESSING • DISTRIBUTION • USE

November 25, 1940

17

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Modulus of elasticity.....	20,000,000
Torsional modulus elasticity.....	7,500,000
Transverse strength, lbs.....	3,000
Transverse deflection, in..... (test bar 1.2" diameter, 18" span)	0.04
Brinell hardness.....	220
Weight per cubic inch, lbs.....	0.26

**THE INTERNATIONAL NICKEL COMPANY, INC.**

67 WALL STREET  
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# HIGHLIGHTING THIS ISSUE

■ A PRIORITIES committee is expected to be named soon for the steel industry. But rationing of steel, it is said (p. 32), is not in prospect. One purpose of the committee will be the smoothing out of tight spots that may develop here and there in the supply of steel. . . . In the meantime (p. 93) consumers are becoming reconciled to the large amount of rationing now being practiced by the steel producer. . . . Steel output last week (p. 29) gained 1 point, to 97 per cent of ingot capacity. Full operations will be the rule for as far ahead as can be seen; informed opinion is that production will be at capacity all through 1941, provided that Britain and Germany continue at war.

Large-scale bombing of Coventry, Birmingham and other industrial cities is expected to intensify British steel and armament purchases here (p. 93). Increased demand is expected from other directions. Still another factor affecting the future supply is that stocks of pig iron,

### **British**

### **Buy More**

ingots and semifinished steel are in process of reduction. . . . Automobile companies endeavoring to cover their steel requirements over the remainder of the 1941 model year (p. 37) are unable to get protection at present prices beyond the first quarter. . . . How do employers get a "good" or a "bad" press? George R. Reiss (p. 21) gives the answers in an article which deals with industrial relations as seen by a newspaper man.

. . . .

Administrator of the public contracts divisions says (p. 27) safety and health at industrial plants will become a major concern under the Walsh-Healey law.

### **Safety and Health**

Also, instead of considering 40 hours merely as the level above which time-and-a-half overtime begins, the trend will be toward a maximum work-week of 40 hours. . . . Those seeking work through state employment offices still (p. 34) number 4,900,000. . . . Machine tool manufacturing capacity

(p. 35) is up 50 per cent. . . . Labor board rules (p. 29) that workers may be solicited during working hours for union membership. . . . The export control administrator (p. 34) sets up a compensation board. . . . FBI compiles a booklet (p. 26) on how to prevent industrial sabotage.

. . . .

Hundreds of American mechanics and tool-makers still are trying to work to "split thousands" in light that would strain the eyes of

### **Let's Have More Light**

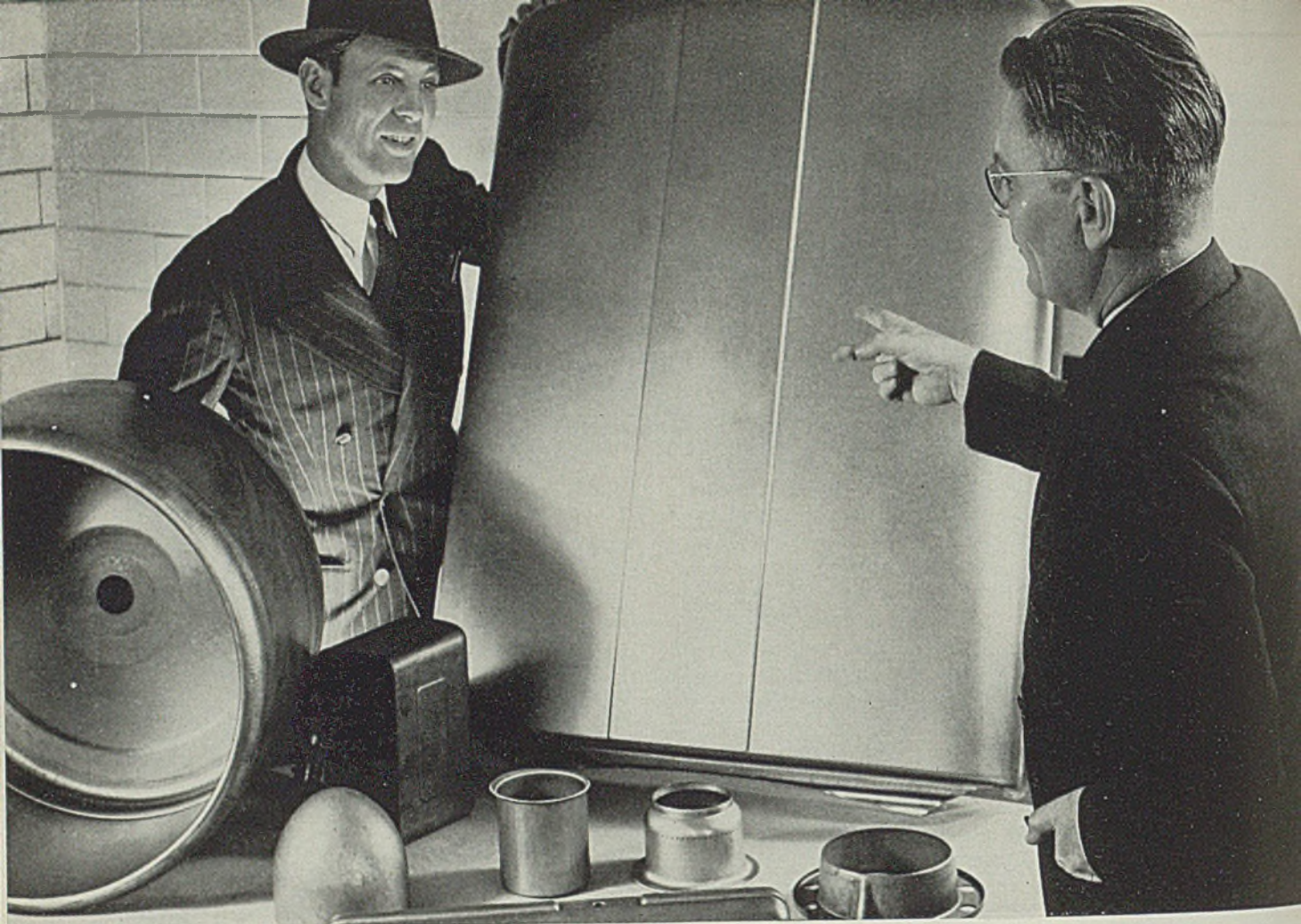
a carpenter laying out the framework for a barn, says Guy Hubbard (p. 50), STEEL's machine tool editor. He tells how production can be increased and quality of work improved through proper illumination. Some of the latest machine tools have "built-in" lighting. . . . Through using prefinished metals many manufacturers are reducing production costs sharply. Carl C. Struever (p. 52) gives some valuable pointers on the fabrication of such materials. . . . E. W. P. Smith (p. 56) discusses strength factors to be considered in designing for welded construction.

. . . .

In these days when plants must be protected against sabotage (p. 45), adequate flood-lighting of boundary fences, plant yards and building

### **Protecting Plants**

exteriors (p. 66) is an important precaution. . . . Control of furnace atmospheres is a subject of increasingly wide interest; many factors not generally appreciated or understood are covered in a new bulletin just issued (p. 72) by the American Gas association. It sets forth effects of each variable on volume and content of products of combustion. . . . Charles Hart (p. 79), concluding his discussion of the smelting of iron ores in electric furnaces, believes that electric energy from Bonneville dam will find its best use in ferroalloys production.



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Cincinnati



George R. Reiss

# INDUSTRIAL RELATIONS

## As Seen by a Newspaper Man

By GEORGE R. REISS

■ Well, Franklin D. Roosevelt has won the presidency again. Make up your mind that the day of the old industrial order is definitely done, gone past resurrection.

The day when the employer's obligation and interest in his employe ended at the mill gate, when he hired or fired because he liked or disliked the color of a man's eyes or the way he parted his hair, when he could say "the public be damned" and get away with it is past, no matter who wins in 1944 or 1948 or 1952.

We've got social security, a wages-and-hours law, a Wagner act and the national labor relations board. They're here to stay, come what may and we've got to learn to live with them, and under this new order.

And the successful industrialist who wants to remain a successful industrialist will do well to devote much time and thought and money to building up a good, sound, solid system of employe and public relations to solve the problem of functioning efficiently in this new order; not just the make-shift, patched-up, less-than-satisfactory systems that have operated so haphazardly for many industries—but a sound, work-a-day, permanent plan of employe and public relations, built on as solid a foundation as industry itself.

The ideal one, of course, would be any which would succeed in inducing the workman to put into his job the same personal interest and take out the same satisfaction that he does in his hobby workshop. The ideal one would be any which succeeds in making management and labor in any concern a big

Because one of the most vital problems of the present day is the setting up of good labor and public relations in the mass production industries, STEEL's editors asked George R. Reiss to write an article on how the typical newspaper man views large employers' efforts to this end.

He has responded by explaining how large employers—steel producers in particular—suffer in their public relations when they fail to cooperate fully with the representatives of the press. Mr. Reiss gives some pointers as to how an employer can develop a "good" or a "bad" press.

Born in Niles, O., Nov. 27, 1903. Mr. Reiss has been familiar all his life with the different aspects of the iron and steel industry. After serving a number of newspapers, including the old Cleveland Times, he joined the staff of the Youngstown Vindicator 13 years ago. Assigned chiefly to covering news of industry, aviation and railroads, he also is a feature writer. He is a frequent contributor to popular magazines. His chief hobby is flying; he holds a private pilot's certificate.

happy family, working shoulder to shoulder, in harmony, for the best interests of both, with an understanding public adding its blessing—and that would be hard to achieve.

The recent election clearly reveals that these employe and public relations systems are still short of the millennium; and a careful analysis of the presidential vote reveals it is very, very far short. Roosevelt cornered his biggest pluralities in the centers of "big industry"—Cleveland, Detroit, Youngstown, Pittsburgh and Gary—and particularly in the workingmen's wards of those centers; he

fared not quite so well in the centers of the many but smaller industries, those of the "personal owner" shops, such as Toledo, Cincinnati, Dayton, and Indianapolis. Wendell L. Willkie garnered his main strength in the "front offices" of those big industries, in the smaller shops, from the small investors and the farmers and small-town home owners.

And why? Aren't, after all, the interests of the plant manager and open-hearth hand in a big Youngstown steel plant as near together as those of the boss and his toolmaker in the Toledo shop employing 25 men? The answer probably is the Toledo shop has a better employe relations system—for the boss and the toolmaker understand each other and each other's problems. Wasn't that a definite proof that class hatreds and class misunderstandings are getting in their evil licks in big industry; and isn't it the job of the relations departments to break down these class hatreds and misunderstandings?

And then, these labor disputes that have belea-



■ "Mr. Big will see you right away." Responsible company officials will build good will for their firm by receiving newspapermen promptly. Reporters have deadlines to meet, do not enjoy cooling their heels in a reception lobby

guered even the well-paid industries. Labor disputes, like war, are based on class hatreds and misunderstandings of the other fellow, and they're just as ridiculous and wasteful as war. Make up your mind then that the industry that has suffered persistently and prolongedly from strikes, sitdowns, slowdowns, unrest and a bad repute among its neighbors is guilty of something or other—and most likely it is an employe and public relations policy that has bogged down somewhere. At least it hasn't worked successfully enough to persuade the industry's employes to take the personal interest they ought to and to keep out the labor agitator.

The fellow who understands his boss' problems doesn't sit down, slow down or walk out. Witness the lack of these in the 3-man, or 5-man or 10-man shop where the boss works at the next bench, where every workman knows the details of his business, his income, his worries about next week's pay roll and what he paid for little Lulu's tonsil job.

That boss has a swell employe relations system—although he probably doesn't recognize it as such—and big industry could well take a tip from him. For big industry's problems are pretty much the same as his problems—on a much larger scale. Big industry's main job, too, is to prove to its workmen that the boss is a pretty good sort of a skate who likes the same movies, the same football game, the same boxing match, the same fishing spot, and who also has a weekly problem in trying to figure how to meet the payroll.

Yes, there's a definite dollars and cents value attached to good employe relations. Just a little example: In one city I know, there are two large industrial

plants, both quite similar in type of products, in size and number of employes—but here the resemblance ends. One has had a considerable amount of labor trouble; there's unrest and a deeprooted feeling of resentment among the employes toward the management; and the other enjoys quite good relations between the workmen and management.

And recently the first plant had another small strike, which moved a friend to comment to me one day:

"A bunch of cheap skates, those fellows who run the A . . . . . plant. They'd certainly do themselves a favor by boosting their wages a little, for they'd get a lot more work out of their help. Now over at the B . . . . . plant . . . ."

"Wait a minute," I interrupted, "Both plants pay the same wage rates."

"No," replied my friend firmly. "That's not possible. I know a lot of the men who work in both plants. The fellows who work in the A . . . . . plant are always grumbling about something, wages or working conditions. The men in B . . . . . plant don't grumble. They seem rather proud of their jobs and quite satisfied. There's a reason—and it must be money."

So we investigated. We found the two plants pay identical wage rates for the same work, but the B . . . . . plant gets a great deal more work out of its men for the same money, for contented workmen produce better results. Tell me there are no dollars and cents value in good employe relations!

And the reason? B . . . . . plant is a home-town industry. There's a cordial relationship between the workmen and the management, who know each other and understand each other. The management takes an active interest in the affairs of the town. The plant executives mingle freely with the workmen at the movies, football games and social affairs, and their sons and daughters go to the same public schools.

Every one of this plant's executives started his career in lowly places along with the men in the mills, as a newsboy, office boy, golf course caddy, theater usher, or steel mill hand, and he's got sense enough to capitalize on it, letting the boys in the mill know that he's still one of them.

And A . . . . . plant? Well, it's an absentee-ownership affair, whose management is apparently quite aloof from the local situation, interested only in its earning power. Few of its executives started in the home plant, few of them ever have cultivated the workmen or earned their respect.

A good place to start building up the employe and public relations fences—they're both hinged up pretty closely together—might be in improving relations with the daily newspapers, chief molders of public opinion. Industry's relations with the papers, particularly the steel industry's relations with the press, have been a shameful episode in most cities, to the detriment of both.

The average business executive just never has been able to fathom what motivates a newspaper man or how to take him; besides, he usually is sadly afflicted with false modesty, and therefore he has dealt with the newspaper man at arm's length. These relations,

or lack of them, is a sore spot in virtually every newspaper office, too. Industrial and financial news is important news and its coverage costs the papers much difficulty and expense; and usually, at best, the papers barely scratch the surface of this news source. Most papers would appreciate a little better co-operation from industry, a fact which wouldn't work to the detriment of industry, remembering the papers, as molders of public opinion, are molders of employes' opinions, too.

Other industry could take a very valuable tip from the air lines and their relations with the newspapers, and how they've been improved in the last decade. You may recall some of the numerous and quite spectacular crashes of the air liners a decade or a dozen years ago, when the air lines had their modest beginnings. Well, the newspapers covered, or tried to cover, these crashes, as it was their job to do, but under great handicaps. The air line people, zealots that they were, zealously sought the papers' co-operation in the job of selling aviation to the public; but they resented the papers in times of stress.

They feared the publicity given the crashes, fearing it might hurt aviation and its future, unmind-

ful of the quite obvious fact that aviation's greatest handicap was not the crashes and their loss of life but the cloak of mystery they drew around them.

The immediate result was a clash between the press and the air lines each time an air liner crashed with loss of life. The air line people tried, and often succeeded, in smashing photographers' cameras, harassed reporters, refused them information.

Oh, the newspaper fellows got their stories all right, the best way they could. Few of them with any background in aviation, they interviewed witnesses—and usually air crash witnesses who have no aviation background are unreliable, untrustworthy witnesses—and pieced together the story, bit by bit, the best way they could. And the result quite often was startling. The boys, with their ignorance of aviation and with their sense of the drama, wove together some spectacular mysteries about each crash.

And the immediate result was that a frightened public, fearful of the unknown and unable to fathom the mystery, stayed away in droves from this swift, comfortable, pleasant and reasonably safe mode of transportation.

But came the dawn. The air lines, grown up and more experienced, have discovered how to salvage something from each of these crashes and to turn it into favorable publicity, or at least to nullify the destructiveness of it. Simply by removing the cloak of mystery around each.

Perhaps you recall the recent crash of a huge twin-engined Douglas air liner of Pennsylvania-Central Air Lines near Lovettstown, Va., with a loss of 25

■ Facts are the life blood to a newspaper. Reporters and editors, working under tremendous pressure, go to great pains to check stories for accuracy. Industrialists who make themselves available to newspapermen, and who frankly discuss matters with them, are less likely to be embarrassed by publication of unfavorable articles



lives. Pennsylvania-Central, instead of harassing the reporters and smashing cameras, telephoned the newspapers, invited the reporters to its executive offices, relayed every available scrap of information as it came off the company's private wires, counselled them, gave them every aid. One bad item, a story of an alleged message thrown from the plane to warn of the impending crash, got out. Air line officials showed the reporters how impossible it would have been to drop such a message, and the story was quickly killed.

And did this coverage of the crash—the most disastrous in the history of commercial aviation in the United States—hurt the air line's business?

It did not! Every ship of the line continued to operate on schedule with every seat filled, there was no appreciable loss in traffic; and the air line was moved to write a nice letter to each editor thanking him for his part in so fairly publicizing the unfortunate accident.

As a result of this new order, the newspapers have developed a corps of aviation writers who, as a group, rate as probably the best informed specialty

■ When Irving S. Olds, chairman, and B. F. Fairless, president, United States Steel Corp., recently visited key cities, they arranged receptions for newspapermen. Such actions go a long way in cultivating better public relations through the newspapers

writers; and the air lines have built up sprightly publicity departments which get barrels of good publicity, stimulating the aviation business and building up goodwill, by sending out good lively articles which get printed in the papers; not the dull, asinine, lifeless blurbs with which most concerns litter the editors' wastebaskets.

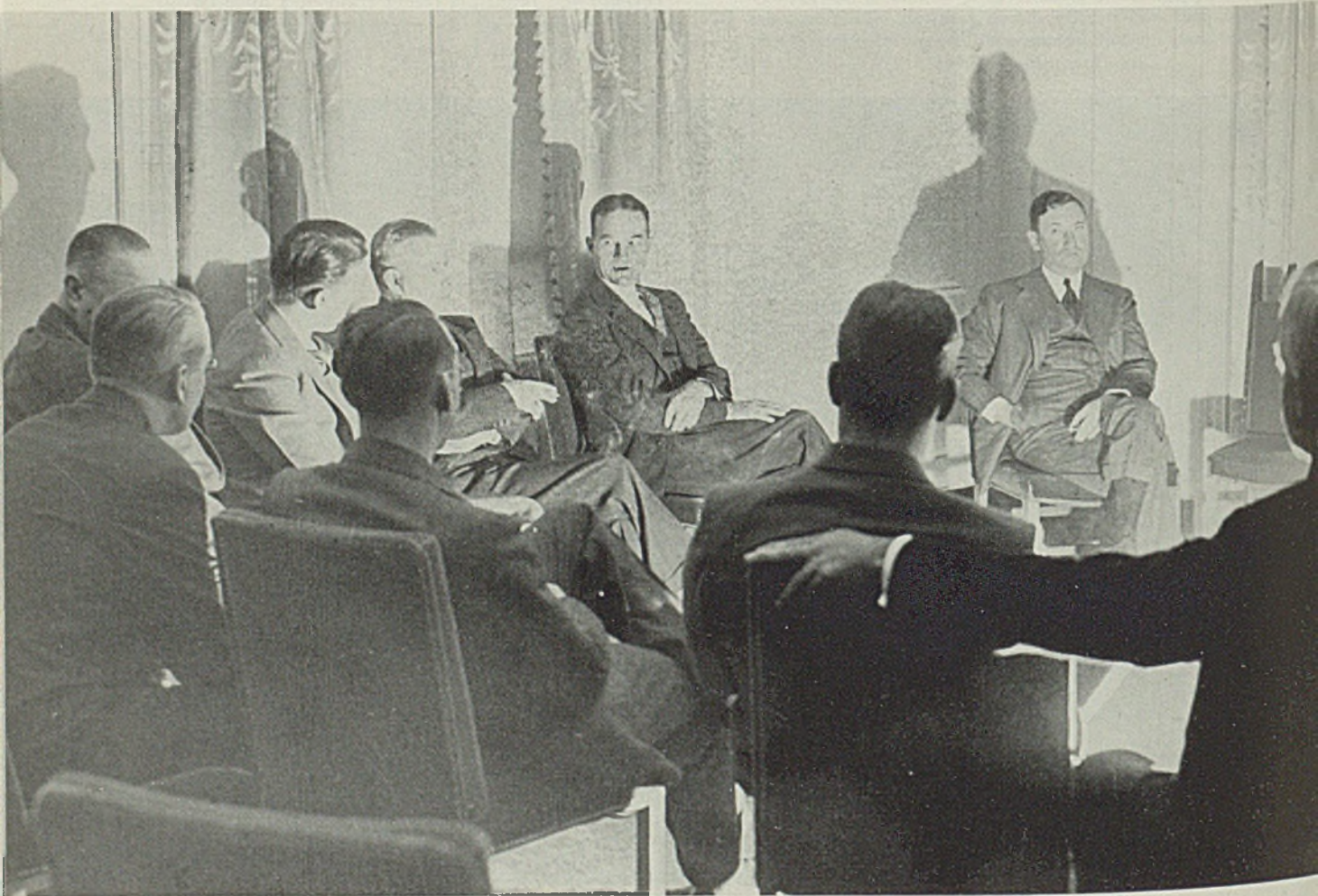
Compare this with an incident which happened in a certain steel plant:

Some years back, a disastrous fire hit a large building in the plant. City firemen responded to the call and reporters and photographers sought to ride in with them. The firemen were admitted after the photographers and reporters were hustled, at pistol point, off the fire trucks by irate mill police. The fire was spectacular, the city firemen did a heroic job in battling it, and the newspaper boys did their best from outside the mill gates.

So later they complained to an important official of the company.

"It'll never happen again, boys," pledged the official, genially. "We'll issue a pass which will admit each newspaper man in cases like that. It'll never happen again."

Well, some years have elapsed, the passes never have been forthcoming, and just the other day another fire hit the same plant. City firemen again responded to the call, and a photographer sought to ride to the scene with them. They were admitted



—Pittsburgh Sun-Telegraph Photo



after mill police hustled the photographer off the fire truck at pistol point.

I know an important steel executive—and you probably know him too, because he's an important figure in the steel industry—who admitted a young newspaperman, then a beginner in the craft, to his office. The incident occurred some years ago. The youngster was on an assignment from an important news syndicate to write an article on a new steel process, and he sought the executive's help for a simple explanation.

"Sit down," bellowed the executive menacingly.

"Now," demanded the executive, "what in hell do you know about the steel business?"

"Nothing," replied the lad, truthfully.

"Then how do you expect to write about it?"

"But," explained the lad, "I'm not writing a technical article. All I want is a simple, concise explanation of the process. One doesn't have to be a technical man . . ."

"No," interrupted the steel man, "I haven't time to be bothered."

He quickly ushered out the lad without the information, information he could have given in a few moments and which would have enabled the newspaperman to send out his article accurately and concisely.

Some years later, the same executive found himself in a predicament out of which the newspaperman could have extricated him quite nicely, and he appealed to the writer. The writer, incidentally, had come up a little in his chosen trade.

"Mr. Z. . . .," demanded the writer, "what the hell do you know about the newspaper business?"

"Huh? Er, why . . ." stammered the executive, taken back in surprise, "Why, er . . . nothing. But I thought you might help . . ."

"Well," interrupted the writer, "I just haven't time to be bothered. Good day."

Well, the situation got out of hand; you may recall the incident. It developed a big story.

An acquaintance of mine recently wrote an article on the steel business. The head of a certain large steel company took violent exception. Calling the writer by telephone, the executive protested:

"Your article may be true generally, but it isn't true about my company, and it is liable to do us a lot of harm."

"I'm sorry," said the writer politely, "I didn't know that it didn't go for your company, too."

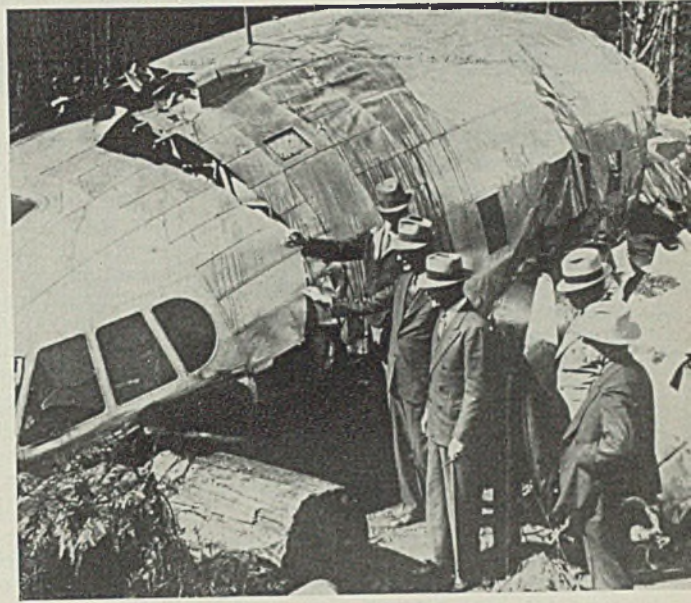
"Well, why in hell didn't you take time to find out?" snapped the executive irritably. "Why didn't you let me know before it was published?"

With which the writer blew up.

"Mr. Z. . . .," he said, icily. "You have succeeded in making yourself inaccessible. You pride yourself on being inaccessible. You have an efficient secretary who zealously guards your privacy, presumably on your orders."

"I have tried before to get by the secretary who guards your privacy, to discuss matters of mutual interest, only to be stopped by your secretary. Very well, I'll respect your privacy, until you decide to call it all off. The next time I have an article that concerns you, you may, to protect your interests, call me before it is published."

Many industrial companies have publicity depart-



■ In the early days of commercial aviation, the airlines placed all possible obstacles in the way of reporters and photographers covering air liner crashes. Many lines now have altered their policy, give newspapermen all possible co-operation. Result: They get a better press

ments whose duty it is to send out to the newspapers and magazines favorable blurbs designed to build up good will and to sell its products; but what a tough job it is to get the really attractive news out of the companies, often a job that takes days or weeks while the piece is shunted from one executive to another before release.

No wonder the boys aren't too enthusiastic in their co-operation in the times of stress when industry really needs them.

And then in our town, we have a chief operating executive of another large industrial concern. The first day that the new executive, a very personable, genial young man, came to town he visited the newspaper offices. He was introduced all around to the newsmen, reporters, copyreaders, editors, and even the cubs—and then he left a very startling message.

"Boys," he said, "I'm a new man here. I've just taken over this new job and it's a tough job. You've got tough jobs, too. We'll get along well together. I'm a very busy man, but whenever there's anything that concerns me or my company, I'll have time. Just feel free to call me at any time, about anything."

Did he lose any dignity or any of the respect in which the boys might have held him? He did not. Instead he gained their respect. No, they didn't call him out of his important conferences about trivial matters. No, they reserved the invitation for the important matters, and he and his company get all the breaks they can throw his way. His plant, by the way, is running very smoothly and efficiently, without any signs of unrest or trouble.

Yes, there's a definite need for improved employe and public relations for industry, and the first step might be in improving relations with the newspapers.

# Shelters for Trainees Lead in \$2,000,000,000 Building Program

■ ANALYSIS of the \$2,000,000,000 defense construction program was issued last week by the national defense advisory commission.

This analysis shows present legislation calls for federal expenditures of approximately \$2,000,000,000 for defense construction of various kinds through June 30, 1942. More than \$1,000,000,000 of this work is under way, providing troop quarters, air and naval stations, plant facilities for manufacturing airplanes, tanks, ammunition, and other military supplies, and facilities for the construction of ships.

The largest single classification under the construction program is the building of shelters for trainees, at a total cost of \$631,000,000. This includes shelter for the national guard, the expanded regular army, increased quarters for navy personnel, as well as trainees under the selective service program. These buildings will be largely of wood construction, and a majority will be completed within the next few months.

The second largest classification is \$520,000,000 for construction of "productive facilities." Under this classification are airplane and engine plants, armor, tank, ammunition and loading plants, shipways and shipyard facilities.

In addition, there are large plant expansions and new plant construction financed entirely with private funds. It is estimated that total private factory construction will be

\$330,000,000 for this year, and may increase to \$500,000,000 in 1941.

The Reconstruction Finance Corp. has authorized loans of \$175,000,000 to private industry for defense construction (or for construction and equipment when the two are not separable). About \$154,000,000 of this total of loan authorizations has been made with firms producing aircraft and related products.

The third classification is \$337,000,000 for air bases. This includes hangars, shops, administration buildings, and utilities at army and navy air bases.

The fourth classification calls for the expenditure of \$258,000,000 under "other military construction." This expenditure includes seacoast defenses, and construction at military and naval stations other than air bases.

The fifth classification shows \$240,000,000, including land cost, is available for defense housing. This is expected to provide 65,000 of the 70,000 dwelling units necessary for defense workers and families of enlisted men. Practically \$100,000,000 appropriated to the army and navy for defense housing has been allocated and construction is under way.

Further, preliminary planning and design studies are under way for construction of the remaining \$140,000,000 of housing for defense workers, the bulk of the actual work to be done during 1941.

In addition to the defense con-

struction program covered by direct appropriations or contract authorizations, there are other government financed construction activities related to defense. The civil aeronautics authority has \$40,000,000 for civil airports which contribute to the total air facilities of the country. The works progress administration has been spending a similar sum annually for work on airports and airways. The extra set of locks for the Panama Canal are part of the total picture but have little immediate effect on construction totals.

## FBI Tells How To Guard Against Spies, Saboteurs

■ Federal bureau of investigation has prepared a booklet entitled *Suggestions for Protection of Industrial Facilities* to aid manufacturers of defense materials protect their plants against espionage and sabotage. Copies may be obtained from the FBI at Washington upon written request by an executive official of a firm manufacturing defense materials.

The FBI conducted surveys of large plants equipped to make defense materials a year ago with the view of making recommendations to bolster the physical protective facilities.

"The first and final responsibility to give speed and strength to our national defense program by protection against espionage and sabotage lies with industry itself," says J. Edgar Hoover, FBI director. "Only through energy and alertness of its officials and workers will the full measure of preparedness be attained."

## All Regions Share in National Defense Material Contracts

■ National defense advisory commission has analyzed the distribution of defense contracts by classifications, geographic regions and industrial areas.

This breakdown includes all major contracts let to Nov. 1. Where a concern maintains a central office and has a plant located in some other industrial area, the contract has

been assigned to the producing plant.

The analysis represents the spread of primary defense contracts throughout the industrial structure of the nation. The figures do not show the subcontracts by which raw materials and subassemblies are provided for the main contractor. In many industries these subcontracts

represent more than 50 per cent of the entire expenditure. For example, a recent study showed 536 manufacturers located in 30 states contributed to the construction of one bomber, thus spreading much more extensively than shown in this tabulation the actual distribution of defense contracts throughout the entire nation.

Region	Ship Construction	Other Construction (In thousands of dollars)	Airplanes, Engines	Ordnance, Ammunition	Other Mfg.	Total
New England .....	\$861,268	\$112,146	\$134,403	\$158,833	\$ 55,828	\$1,322,478
Middle Atlantic .....	1,046,641	80,686	217,724	419,519	325,657	2,090,227
North Central .....	96,430	91,348	190,149	390,574	245,198	1,013,699
South Central .....	116,804	149,258	1,960	52,051	12,582	332,655
South Atlantic .....	590,338	170,168	229,918	137,366	43,407	1,171,197
Pacific Mountain .....	518,657	126,856	725,337	13,046	12,864	1,396,760
Off Continent .....	720	78,649	.....	.....	124	79,493
Unassigned .....	934	30,479	2,963	66,556	109,209	210,141
<b>TOTAL .....</b>	<b>\$3,231,792</b>	<b>\$839,590</b>	<b>\$1,502,454</b>	<b>\$1,237,945</b>	<b>\$804,869</b>	<b>\$7,616,650</b>

# Walling Cautions Contractors To Adhere to Walsh-Healey Act

WASHINGTON

■ IMPETUS of the defense program has focused attention forcibly on the standards required of industry by the government in defense production, L. Metcalfe Walling, administrator of the public contracts division of the labor department, said last week.

"Many people have become so accustomed to the Walsh-Healey public contracts act after its four years of operation," he said, "that they have almost forgotten about its provisions. Most of American industry is now operating on a 40-hour week with time and one-half for overtime beyond that point as now required of interstate industries under the fair labor standards act.

"This, of course, has been the provision of the Walsh-Healey act for more than four years and has affected a large part of American industry which has been contracting with the government in amounts of over \$10,000. I suspect that this is one of the reasons why the general adoption by industry of the 40-hour week caused so lit-

tle flurry and necessitated so little readjustment."

During the four years the act has been in effect, Mr. Walling said, over 30,000 contracts, valued at about \$3,000,000,000, have been awarded subject to its provisions. These include the 8-hour day and 40-hour week with unlimited overtime at time and a half; the payment of minimum wages determined industry by industry by the department of labor in accordance with the prevailing scales (about 2,000,000 workers in 54 industries come under the minimum wages required in contracts); the prohibition of child labor and of convict labor.

## Few State Safety Laws

Mr. Walling said most states have little legislation regarding health and safety in industry. "Although under the terms of the public contracts act," he said, "the standard of the state where the government contractor is operating is prima facie the standard of compliance by the contractor with the health

and safety provisions of the act, only one-third of all the states are in a position to advise us about the physical conditions of work in plants receiving government contracts."

"Frankly, until rather recently health and safety conditions have not been important problems in the administration of the act. Many of the companies dealing with the federal government are leaders in their field, not merely in the product which they sell but also in the maintenance of good working conditions in making it."

Only recently the British factory acts, which correspond to our hour and wage legislation, had to be reinstated after a temporary abandonment as it was found production decreased seriously, Mr. Walling said. "There was no question of sabotage involved but a sheer inability to turn out as much work during the longer work week as was possible under the old standards.

"It is of the utmost significance that a nation like Britain, which has been backed into a corner and is fighting a desperate battle for survival, has found as a result of sheer necessity that the World war experience is being repeated and that short hours, decent wages, and good working conditions are the first line of defense in industry.

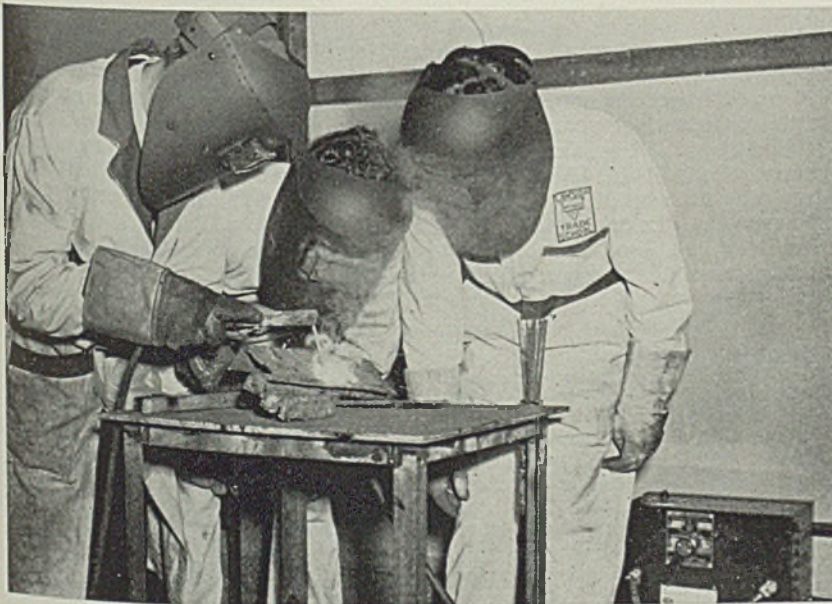
"Fortunately, recognition of the importance of these things has already been given in this country and the secretary of labor has appointed a national committee on the conservation of manpower in defense industries composed of 24 members who are concerned in the problem of good physical working conditions."

## Act Has "Teeth"

The Walsh-Healey act has plenty of teeth if it is necessary to use them, Mr. Walling said. "We are not using coercion to bring about the desired result. I am sending a letter to every company which has a defense contract advising it of the free and expert service which is available to it in giving assistance in a program to lessen its accident and death rates.

"We must remember that the government is now dealing with many new and small companies which have not been in the government market before but who are being drawn in by the government through its policy of negotiating contracts directly as well as by competitive bidding to provide as many sources of supply as possible. Many of these companies are not safety conscious. Many have no health and safety program and, of course, no safety expert whose job is to watch like a hawk the industrial accident and death figures."

## Industry Options Services of Welding Students



■ Industry already has placed an option on two-thirds of the men enrolled in welding classes at the Lawson Y. M. C. A. trade school in Chicago, opened recently to train workers for defense industries. Co-operating with the Y. M. C. A. are several large Midwest metalworking companies. Progress of the

classes is planned and watched by an advisory council composed of prominent Chicago welding experts. On completing the course, the graduates qualify as welding apprentices, each having 90 hours of electric and 90 hours of gas welding. Photo, courtesy, General Electric Co., Schenectady, N. Y.

# FINANCIAL

## REPUBLIC TO PURCHASE \$6,300,000 PREFERRED STOCKS

■ REPUBLIC STEEL CORP. will set aside \$6,300,000 in a fund to purchase its 6 per cent cumulative convertible preferred stock, directors decided last week. The amount is equal to slightly more than half the par value of the 119,597 outstanding shares of this stock. The fund does not apply to the series A, 6 per cent cumulative convertible prior preference stock.

Directors also declared dividends of \$1.50 per share on the series A, 6 per cent cumulative convertible prior preference stock, and on the 6 per cent cumulative convertible preferred stock, payable Jan. 1, 1941, to record of Dec. 12, 1940.

Republic Steel originally issued, in 1930, \$60,000,000 of the 6 per cent cumulative convertible preferred stock. During 1935 and 1936 the amount was reduced through exchanges of stock to \$11,959,700, which is still outstanding.

Provisions of this stock required the corporation to set aside semi-annually, beginning in 1930, \$300,000 as a purchase fund. The \$6,300,000 covers this requirement to date.

The directors' action, with previous removal of dividend arrearages, now opens the way for common stock dividends.

T. E. Girdler, chairman, said he believes the steel industry will work virtually at full operations through 1941. He expects Britain's steel buying in the United States to increase in volume. At present it is England's tendency to buy relatively larger percentages of finished steel, rather than semifinished.

## WOODWARD IRON CO. PLANS \$6,618,500 REFUNDING

Woodward Iron Co., Woodward, Ala., has called a stockholders' meeting Nov. 29 to pass on proposed refunding of its \$6,618,500 outstanding first mortgage bonds. The bonds are callable Jan. 1, 1941, at 104 and accrued interest.

To accomplish refunding, the company proposes to borrow \$2,000,000 from banks to mature \$200,000 May 1, 1941, with like payments falling due each six months thereafter until completed. There will also be a new issue of \$4,750,000 first mortgage bonds.

Latter will be in three series. One will bear 2½ per cent interest and will be payable \$200,000 May 1, 1946, with like amounts falling due Nov. 1, 1946; May 1, 1947; and Nov. 1, 1947. Another series will be 3½ per cent, aggregating \$3,450,000 and due Nov. 1, 1955. This issue will

carry a sinking fund provision for retirement of \$400,000 per year beginning Nov. 1, 1948. Third issue will be \$500,000 of 3½ per cent bonds, due Nov. 1, 1955, with no sinking fund requirement.

## INTERNATIONAL NICKEL NETS \$26,425,104 IN NINE MONTHS

International Nickel Co. of Canada Ltd., Copper Cliff, Ont., reports net profit earned in first nine months this year was \$26,425,104 after all charges. This was equal, after preferred dividend requirements, to \$1.71 per share on common and compared with net profit of \$26,584,806 or \$1.72 per common share in the corresponding period a year ago.

Net profit in quarter ended Sept. 30 was \$8,364,811, and was equal to 54 cents per share on common. In the period in 1939, net profit was \$8,240,179 or 53 cents per common share.

## COLD METAL PROCESS PAYS \$500 PER SHARE DIVIDEND

Cold Metal Process Co., Youngstown, O., last week paid a dividend of \$500 per share on 2000 shares outstanding. Distribution, \$1,000,000, represented about one-third the cash settlement received from United States Steel Corp., New York, on past royalties on Steckel patents. It is reported less

than 20 persons own all Cold Metal stock. The company liquidated outstanding debts with part of the settlement.

## Mining and Metallurgical Engineers Elect Officers

■ John Robert Suman, vice president, Humble Oil & Refining Co., Houston, Tex., has been elected president, American Institute of Mining and Metallurgical Engineers, New York. Paul D. Merica, vice president, International Nickel Co. of Canada Ltd., New York, and LeRoy Salsich, president, Oliver Iron Mining Co., Duluth, have been elected vice presidents.

New directors include J. Terry Duce, vice president, California Arabian Standard Oil Co., San Francisco; Ira B. Joralemon, president, Desert Silver Inc., San Francisco; J. R. Van Pelt Jr., assistant director, Museum of Science and Industry, Chicago; and Clyde E. Williams, director, Battelle Memorial institute, Columbus, O.

Marcel Schlumberger, jointly with his brother, Conrad, who died in 1936, have been awarded the Anthony F. Lucas gold medal for 1941 in recognition of their work in developing methods for the electrical "coring" or "logging" of oil wells.

## Consumers' Third Quarter Earnings Statements

■ STEEL'S tabulation of 145 iron and steel consumers' earnings in third quarter, 1940, shows their aggregate net profit for the period was \$67,281,094 or 41.3 per cent more than \$47,620,135 earned by the same companies in the quarter last year. Nine reported a net loss for the period, against 24 last year. The same companies' net profit in first nine months this year totaled \$223,914,936 or 70.6 per cent more than \$131,279,483 in the first nine months of 1939. Eight reported a deficit for the period, against 21 last year. Prior tabulations in STEEL (Oct. 28, p. 28; Nov. 4, p. 23 and Nov. 11, p. 28, listed 124 companies; the following includes 21. All figures are net earnings, except where asterisk denotes loss:

	—Third Quarters—		—Nine Months—	
	1940	1939	1940	1939
Briggs Mfg. Co., Detroit	\$ 45,833	\$ 30,475	\$4,286,222	\$2,067,264
Chicago Pneumatic Tool Co., New York	438,158	288,652	1,121,102	676,891
Curtiss-Wright Corp., New York	2,069,670	1,172,748	8,305,639	4,543,852
Electric Auto-Lite Co., Toledo, O.	70,013†	1,019,798†	3,948,679	3,850,734
Fairchild Aviation Corp., Jamaica, L. I.	103,085	154,391	422,032	295,512
Graham-Palge Motors Corp., Detroit	469,944*	360,763*	1,016,596*	1,077,104*
Hercules Motor Corp., Canton, O.	73,024	129,729	291,899	297,352
Lynch Corp., Anderson, Ind.	75,862	59,492	292,110	287,941
Mack Trucks Inc., Long Island City, N. Y.	353,559	82,434	1,167,855	245,191
Marlin-Rockwell Corp., Jamestown, N. Y.	430,321	465,683	1,726,470	947,350
Pullman Inc., New York	2,271,979	2,269,265	5,705,642	3,341,947
Reed Roller Eit Co., Houston, Tex.†	317,867	445,026	1,080,906†	1,284,586†
Rheem Mfg. Co., Richmond, Calif.	95,181†	178,930†	418,985	396,475
Smith, L. C., & Corona Typewriters Inc., Syracuse, N. Y.	101,175	15,703*	365,705†	148,557†
Sullivan Machinery Co., Michigan City, Ind.	151,386	88,880*	264,106	124,894†
Terre Haute Malleable & Mfg. Co., Terre Haute, Ind.†	10,708	4,479	26,146	20,269
Timken Roller Bearing Co., Canton, O.	1,944,052	1,486,564	6,940,598	4,908,934
Union Wire Rope Corp., Kansas City, Mo.	22,946†	24,566†	96,648	89,925
United Aircraft Corp., East Hartford, Conn.	2,971,662	2,120,617	9,199,768	5,799,307
Van Dorn Iron Works Co., Cleveland	27,060	36,853	103,561	47,697
Weston Electrical Instrument Co., Newark, N. J.	72,392†	163,570†	574,288	317,296

\*Loss; †indicated; ‡before federal taxes.

## Youngstown Sheet & Tube To Rebuild Billet Mill

■ Youngstown Sheet & Tube Co. will increase its Campbell, O., plant's semifinished steel capacity 200,000 tons a year by rebuilding the billet mill, although Frank Purnell, president, said "it is doubtful whether over the long pull this tonnage will be required from this district." Cost is estimated at several hundred thousand dollars.

Republic Steel Corp. has awarded a contract for rebuilding No. 4 blast furnace in Youngstown to John Moore & Sons, Chicago. Capacity will be increased slightly. No date has been set for blowing out, due to need for pig iron.

## 83% Expansion Made by Aircraft Industry

■ American aircraft industry completed an 83 per cent expansion of factory working area in the 14½ months between outbreak of war in Europe and Nov. 15, according to Aeronautical Chamber of Commerce of America.

Additional plants, under construction or contemplated for the immediate future, will bring total facilities to a level 265.8 per cent above September, 1939. Major part of the gains have taken place in leading producers' aircraft engine factories. Expansion in this group exceeded 130 per cent.

## Union Solicitation on Company Time Upheld

■ Recent ruling by the national labor relations board holding the prohibition of union activity and solicitation during working hours runs counter to a practically universal plant rule and apparently outlaws clauses in many CIO contracts.

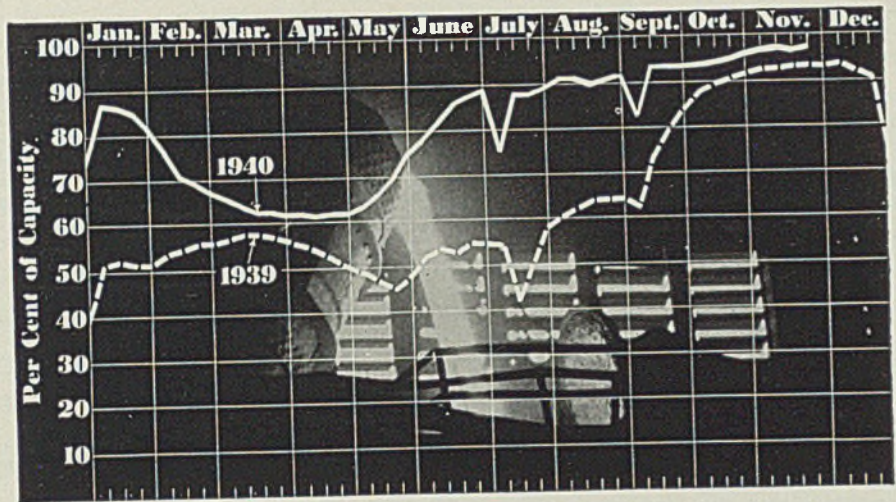
The board's action in three cases affecting Paragon Die Casting Co., Chicago, Jensen Radio Mfg. Co., Chicago, and the Bersted Mfg. Co., Fostoria, O., held the ban on union activity was "discriminatory" because other forms of solicitation were not prohibited. The unions party to the cases were CIO affiliates.

The so-called standard CIO contract provides: "The union agrees . . . not to solicit membership on corporation time or plant property."

While the ruling amazed many personnel managers, some remarked that it may be necessary to prohibit solicitations of all kinds.

## Edward Brooke Sr. Dead

■ Edward Brooke Sr., 78, for many years head of E. & G. Brooke Iron Co. and Birdsboro Iron & Steel Foundry Co., Birdsboro, Pa., died in Reading, Pa., Nov. 27. He retired in 1932.



## PRODUCTION . . . Up

■ STEELWORKS operations last week advanced 1 point to 97 per cent, highest since May, 1929. Six districts made small gains, four receded fractionally and two remained steady. A year ago the rate was 93½ per cent; two years ago it was 62 per cent.

**Youngstown, O.**—With 72 open hearths and three bessemer in production the operating rate held at 93 per cent.

**St. Louis**—Addition of one open hearth increased the rate 2½ points to 87½ per cent.

**Chicago**—Up 1 point to 100 per cent, a new record. Previous high was 99 per cent during weeks of Aug. 26, Oct. 14 and Nov. 11.

**Cincinnati**—Gained 9½ points to 97½ per cent, the same rate scheduled this week.

**Pittsburgh**—Rebounded to 97 per cent, making up the loss of 3 points the previous week. Estimates for this week indicate a new high.

**Wheeling**—Dropped 5 points to 93½ per cent, due to repairs at one plant.

**Detroit**—Increased 3 points to 96 per cent, only one open hearth being idle.

**Central eastern seaboard**—Steady at 94 per cent. Only mechanical difficulties prevent a higher rate.

**Buffalo**—Completion of repairs to an idle open hearth caused a rise of 2½ points to 93 per cent.

**New England**—Off 3 points to 82 per cent, minor repairs causing shutdowns.

**Birmingham, Ala.**—Removal of one open hearth for repair cut the rate 3 points to 97 per cent.

**Cleveland**—Removal of one open hearth caused the rate to decline 2 points to 86 per cent. Another unit under repair will be in service this week.

## Automobile Production Lowered by Holiday

■ Automobile production for the week ended Nov. 23 was 102,340 units, compared with 121,943 in the preceding week and 72,520 in the corresponding week in 1939, according to *Ward's Reports*. The decrease was ascribed to the Thanksgiving holiday interruption. Additional statistics will be found on page 38.

## Foundry Equipment Index Up in October

■ Foundry Equipment Manufacturers' association, Cleveland, reports index of net orders closed for new equipment in October was 284.8, compared with 162.0 in September. Index for repairs was 201.8 in October and 158.6 in September. Total sales index was 264.0 in October and 161.2 in September.

Indexes are per cent of monthly average of sales to metalworking industries, 1937-39. Practical comparison on the old base, 1922-24, can be determined by multiplying new base figures by 1.328.

## District Steel Rates

	Percentage of Ingot Capacity Engaged		In Leading Districts	
	Week ended Nov. 23	Change	1939	Same week 1938
Pittsburgh . . . . .	97	+ 3	94	50
Chicago . . . . .	100	+ 1	95	58.5
Eastern Pa. . . . .	94	None	86	34
Youngstown . . . . .	93	None	90	61
Wheeling . . . . .	93.5	- 5	93	66
Cleveland . . . . .	86	- 2	88	77
Buffalo . . . . .	93	+ 2.5	95	53.5
Birmingham . . . . .	97	- 3	94	75
New England . . . . .	82	- 3	100	74
Cincinnati . . . . .	97.5	+ 9.5	84.5	70
St. Louis . . . . .	87.5	+ 2.5	81	48.5
Detroit . . . . .	96	+ 3	90	82
Average . . . . .	97	+ 1	93.5	62

# Defense Contracts \$326,734,978

## In Week; Include Shell Plants

DEFENSE contracts reported last week totaled \$326,734,978.54, with purchases by army and navy departments fairly evenly divided. Ordnance and aircraft awards were heaviest.

War department announced contract totaling \$34,451,384 to Day & Zimmerman Inc., Philadelphia, for the design, supervision of construction, installation of equipment and operation of a shell-loading plant near Burlington, Iowa. Agents selected by the quartermasters corps have been ordered to proceed with purchase of approximately 20,000 acres for the government. Negotiations for the plant's construction have not been completed.

Awards of contracts for construction and operation of a shell-loading plant at Union Center, Ind., were also reported by the war department. Bates & Rogers Construction Co., Chicago, will construct the plant at a cost-plus-fixed-fee of approximately \$11,500,000. Todd & Brown Inc., New York, will operate it on a similar basis, at an estimated cost of \$26,800,000.

Navy department made a contract with Grumman Aircraft Corp., Bethpage, N. Y., for acquisition and installation of additional plant equipment and facilities at Grumman's Bethpage plant. Cost is estimated at \$3,500,000. Contract will enable the company to add 400,000 square feet of productive floor space, completely equipped.

Navy department last week announced the following:

**Bureau of Supplies and Accounts Awards**  
 Acme Machine Tool Co., Cincinnati, turret lathes, \$82,480.30.  
 Ajax Electrothermic Corp., Trenton, N. J., electric melting furnaces, \$29,250.  
 American Automatic Electric Sales Co., Chicago, lever keys, \$5054.70.  
 American Steel & Wire Co., Cleveland, electric cable, \$67,413.61.  
 Anaconda Wire & Cable Co., New York, electric cable, \$42,019.  
 Bausch & Lomb Optical Co., Rochester, N. Y., ship telescopes, \$57,280.  
 Bertsch & Co. Inc., Cambridge City, Ind., roll machine, bending rolls, \$30,295.  
 Bishop Wire & Cable Corp., New York, cable, \$13,295.  
 Breeze Corporations Inc., Newark, N. J., swaging machines, \$5362.50.  
 Brooke, E. & G., Iron Co., Birdsboro, Pa., pig iron, foundry, \$6000.  
 Brown & Sharpe Mfg. Co., Providence, R. I., grinding machines, \$36,975.  
 Bryant Machinery & Engineering Co., Chicago, drills, \$5320.  
 Builders Iron Foundry, Providence, R. I., deep hole boring lathes, \$62,000.  
 Chicago Pneumatic Tool Co., Philadelphia, aircraft type riveters, \$5695.25.  
 Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, grinding machines, \$27,440.15.  
 Circle Wire & Cable Corp., Maspeth, Long Island, N. Y., cable, \$7105.

Clearing Machine Corp., Chicago, press brake, \$14,200.  
 Collyer Insulated Wire Co., Pawtucket, R. I., electric cable, \$33,565.50.  
 Crescent Truck Co., Lebanon, Pa., electric industrial trucks, \$8238.75.  
 Crucible Steel Co. of America, New York, alloy steel forgings, \$64,890.  
 Dana Tool-D Nast Machinery Co., Philadelphia, drill chucks, \$10,158.71.  
 Electric Products Co., Cleveland, motor-generator set, \$9050.  
 General Cable Corp., New York, electric cable, \$56,749.84.  
 General Electric Co., Schenectady, N. Y., electric cable, \$66,552.42.  
 General Fireproofing Co., Youngstown, O., aluminum chairs, \$361,435.65.  
 General Machinery Corp., Niles Tool Works division, Hamilton, O., engine lathes, \$115,207.50.  
 Grumman Aircraft Engineering Corp., Bethpage, N. Y., aircraft wings, \$30,888.20.  
 Hanson-Van Winkle-Munning Co., Matawan, N. J., motor-generator set, \$6916.  
 Hickok Electrical Instrument Co., Cleveland, aircraft indicators, \$24,117.19.  
 Homelite Corp., Port Chester, N. Y., light

weight generators, \$12,380.97.  
 IDL Mfg. & Sales Corp., New York, steel shears, \$30,500.  
 Jones & Lamson Machine Co., Springfield, Vt., turret lathes, \$27,383.36.  
 Kearney & Trecker Corp., Milwaukee, milling machine, \$7011.05.  
 Kidde, Walter, & Co. Inc., New York, fire extinguishing outfits, \$40,892.40.  
 LeBlond, R. K., Machine Tool Co., Cincinnati, engine lathes, \$16,105.  
 Leonard, Ward, Electric Co., Mt. Vernon, N. Y., portable rheostats, \$6334.  
 Lewis Engineering Co., Naugatuck, Conn., leads and connectors, \$15,570.  
 Lionel Corp., New York, battle lookout alidades, \$87,200.  
 Lloyd & Arms Inc., Philadelphia, horizontal honing and lapping machine, portable bore grinder, \$89,748.05.  
 Marsh Stencil Machine Co., Belleville, Ill., stencil-cutting machines, \$5250.  
 Mattison Machine Works, Rockford, Ill., horizontal surface grinder, \$27,377.  
 Metal Reduction Corp. of New Jersey, North Bergen, N. J., pig metal bronze, \$28,782.  
 Midvale Co., Philadelphia, alloy steel forgings, \$26,775.  
 Monarch Machine Tool Co., Sidney, O., engine lathes, \$49,883.04.  
 National Electric Products Corp., Pittsburg, electric cable, \$20,533.50.  
 National Supply Co., Toledo, O., alloy steel forgings, \$12,726.  
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., radial

## Purchases Under Walsh-Healey Act

(In Week Ended Nov. 9)

Iron and Steel Products	Commodity	Amount
Albert Pipe Supply Co. Inc., Brooklyn, N. Y. ....	Steel pipe	\$20,812.83
American Chain & Cable Co. Inc., Bridgeport, Conn. . .	Cores	21,950.00
Babcock & Wilcox Tube Co., Beaver Falls, Pa. ....	Steel tubing	299,933.54
Behringer, E., Sheet Metal Works Inc., Newark, N. J. . .	Shells	56,330.00
Blackhawk Mfg. Co., Milwaukee .....	Jack assemblies,	
	jacks	198,119.40
Blickman, S., Inc., Weehawken, N. J. ....	Galley tubs	29,950.00
Boston & Lockport Block Co., East Boston, Mass. ....	Block sheaves	13,642.98
Builders Iron Foundry, Providence, R. I. ....	Tubes	12,862.50
Bunell Machine & Tool Co., Cleveland .....	Vises	19,383.60
Case Crane & Kilbourne Jacobs Co., Columbus, O. ....	Dish carts	10,363.85
Ceco Steel Products Corp., Chicago .....	Wire fabric	18,940.92
Central Steel & Wire Co., Chicago .....	Strip steel	27,989.80
Cleveland Pneumatic Tool Co., Cleveland .....	Couplings	18,889.15
Consolidated Supply Co., Portland, Oreg. ....	Valves	51,840.00
Doehler Die Casting Co., Pottstown, Pa. ....	Angle tubes	200,565.42
Fairmount Tool & Forging Co., Cleveland .....	Motor maintenance	
	equipment	76,684.80
Hunter Steel Co., Pittsburgh .....	Support towers	33,115.00
Irwin Auger Bit Co., Wilmington, O. ....	Motor maintenance	
	equipment	22,402.55
Joshua Hendy Iron Works, San Francisco .....	Gate assemblies	19,570.00
Kilby Steel Co., Anniston, Ala. ....	Tool brackets	71,489.04
Lancaster Iron Works Inc., Lancaster, Pa. ....	Steel pipe	22,308.00
Mergenthaler Linotype Co., Brooklyn, N. Y. ....	Telescope mounts	*1,194,710.52
Midvale Co., Nicetown, Philadelphia .....	Forgings	8,121,125.31
National Casket Co. Inc., Long Island City, N. Y. ....	Metal caskets	*32,812.00
National Pneumatic Co. Inc., Rahway, N. J. ....	Tubes	178,300.00
Pittsburgh Screw & Bolt Corp., Pittsburgh .....	Bolts	12,631.88
Poor & Co., Canton, O. ....	Drop forgings	49,022.20
Republic Steel Corp., Cleveland .....	Steel	68,856.63
Schubert-Christy Corp., St. Louis .....	Water cooling tower	23,180.00
Service Tool & Engineering Co., Dayton, O. ....	Testing sets	215,213.75
Sherman Supply Co., Seattle .....	Valves	21,414.39
Standard Pressed Steel Co., Jenkintown, Pa. ....	Cores	290,190.00
Tomkins-Johnson Co., Jackson, Mich. ....	Rivet setting	
	machines	12,920.40
Wallace Supplies Mfg. Co., Chicago .....	Manifold exhaust	21,830.75
Weaver Mfg. Co., Springfield, Ill. ....	Motor maintenance	
	equipment	34,433.00
Williams, J. H., & Co., Buffalo .....	Steel forgings	18,545.00
Wire Rope Corp. of America Inc., New Haven, Conn. . .	Wire rope	70,308.00
Wright Aeronautical Corp., Paterson, N. J. ....	Steel forgings	12,900.00
	Aluminum pots	\$83,243.50
Aluminum Cooking Utensil Co., New Kensington, Pa. . .	Aluminumware	43,459.00
Aluminum Products Co., LaGrange, Ill. ....	Brass pipe, cartridge	
American Brass Co., Waterbury, Conn. ....	cups,	1,078,363.00
American-LaFrance-Foamlite Corp., Elmira, N. Y. ....	Fire extinguishers	66,903.30
American Smelting & Refining Co., San Francisco .....	Pig lead	166,760.00

\*Estimated.

drills, \$47,675.  
 Okonite Co., Passaic, N. J., electric cable, \$58,945.20.  
 Pacific Marine Supply Co., Seattle, portable, gasoline engine driven pumps, \$16,968.90.  
 Phelps Dodge Copper Products Corp., British American Tube division, New York, brass pipe, \$51,364.80; Habirshaw Cable & Wire division, New York, electric cable, \$22,957.50.  
 Prentiss, Henry, & Co. Inc., New York, turret lathe, \$5917.  
 Racine Tool & Machine Co., Racine, Wis., hack saws, \$14,762.35.  
 Rasmussen Machine Co. Inc., Racine, Wis., hack saws, \$5672.  
 Rockbestos Products Corp., New Haven, Conn., electric cable, \$18,402.  
 Roebbling's, John A., Sons Co., Trenton, N. J., electric cable, \$43,435.72.  
 Sellers, Wm., & Co. Inc., Philadelphia, boring, drilling and milling machines, \$75,752.  
 Shipley, W. E., Machinery Co., Philadelphia, planers, \$29,014.  
 Simplex Wire & Cable Co., Cambridge, Mass., electric cable, \$25,776.74.  
 Singer Sewing Machine Co., New York, sewing machines, \$16,568.66.  
 Smith Booth Usher Co., Los Angeles, universal grinder, \$5625.76.  
 Sperry Gyroscope Co. Inc., Brooklyn, N. Y., gyro compass equipment, \$265,833.  
 Steel Improvement & Forge Co., Cleve-

land, steel forgings, \$46,806.  
 Submarine Signal Co., Boston, fathometers, \$15,900.  
 Vanadium Corp. of America, New York, ferro-chromium, \$6141.  
 Walker, Henry, Co., Norfolk, Va., tanners' shears, \$5957.98.  
 White, David, Co., Milwaukee, sextants, \$136,534.  
 Westinghouse Electric Mfg. Co., East Pittsburgh, Pa., arc welding, electric sets, welding outlet panels, \$16,820.  
 Wiss, J., & Sons Co., Newark, N. J., sail-makers' shears, \$11,891.54.

### War department announced the following awards for the army air corps:

Aviation Mfg. Corp., Lycoming division, Williamsport, Pa., maintenance parts, \$63,950.18.  
 Barnard Aviation Equipment Co. Inc., Wilkes Barre, Pa., gun trunnion bolts and brackets, \$75,264.  
 Bell Aircraft Corp., Buffalo, assemblies, \$249,375.  
 Bell & Howell Co., Chicago, printer assemblies, \$130,095.50.  
 Bendix Aviation Corp., Pioneer Instrument division, Bendix, N. J., regular oxygen assemblies, \$2,200,967.25.  
 Electric Auto-Lite Co., LaCrosse, Wis.,

gage assemblies and thermometer assemblies, \$193,482.50.  
 Fyr-Fyter Co., Dayton, O., fire extinguishers, \$43,600.  
 General Electric Co., Schenectady, N. Y., maintenance parts, meters, \$129,926.  
 Hayes Industries Inc., Jackson, Mich., assemblies, \$94,177.50.  
 Ingersoll-Rand Co., New York, hammers, \$50,877.75.  
 Kidde, Walter, & Co. Inc., New York, fire extinguishers, \$84,375.  
 Longines Wittnauer Watch Co., New York, clock assemblies, \$179,893.  
 Mallory, P. R., & Co. Inc., Indianapolis, control assemblies, \$342,650.  
 Manning, Maxwell & Moore Inc., Bridgeport, Conn., gage assemblies, \$459,185.  
 Standard Steel Works, North Kansas City, Mo., trailers, dollies, spare parts, \$173,809.  
 Trailer Co. of America, Oakley, Cincinnati, semitrailers, dollies, \$188,052.  
 Weston Electrical Instrument Corp., Newark, N. J., indicator assemblies, \$113,586.

### Quartermaster Corps Awards

American Car & Foundry Co., Milton, Pa., tank cars, \$679,640.  
 Bateman, J. W., Dallas, Tex., temporary buildings and utilities, Ft. Sill, Okla., \$593,300.  
 Fuller Construction Co., Red Bank, N. J.; Wigton-Abbot Corp., Plainfield, N. J., replacement center at Ft. Monmouth, N. J., \$3,222,454.  
 Griffiths, John, & Son Construction Co., Chicago, construction work at Camp Grant, Illinois, \$3,638,773.  
 Hauser Construction Co.; George H. Buckler Co.; Natl McDougall Co., Portland, Ore., air corps cantonment, Portland, Ore., \$1,142,056.  
 J. A. J. Construction Co., Brooklyn, N. Y., temporary housing, Camp Upton, N. Y., \$638,661.  
 Long, John C., Kansas City, Mo.; M. W. Watson, Topeka, Kans.; and Manhattan Construction Co., Muskogee, Okla., construction of cantonment, Ft. Riley, Kansas, \$4,004,380.  
 McDonald Construction Co. and G. L. Tarlton Contractor Inc., St. Louis, construction of hospitals and nurses' quarters at Ft. Clayton and Ft. Gullick, Canal Zone, Panama, \$4,115,478.  
 Webb, Del E., Construction Co., Phoenix, Ariz.; and White & Miller Contractors Inc., Tucson, Ariz., construction work, Ft. Huachuca, Cochise county, Arizona, \$1,140,346.

### Corps of Engineers Awards

American Rolling Mill Co., Middletown, O., steel, \$24,080.  
 American Steel & Wire Co., Worcester, Mass., wire, \$36,140.  
 Bausch & Lomb Optical Co., Rochester, N. Y., mapping equipment, \$366,666.  
 Busch, J. C., Co., Milwaukee, multiplex tables, \$32,000.  
 Northwest Engineering Co., Chicago, diesel shovels, \$43,248.  
 Ritz, Herman F., Lancaster, Pa., theodolites, \$22,200.  
 Vulcan Iron Works, Wilkes-Barre, Pa., locomotives, \$14,985.  
 Whitcomb Locomotive Co., Rochelle, Ill., locomotives, \$35,700.

### Medical Corps Award

Sklar, J., Mfg. Co., Long Island City, N. Y., forceps, \$883,150.

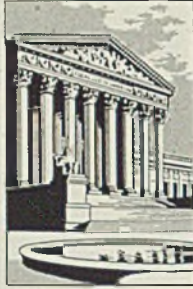
### Ordnance Department Awards

Acme Foundry Corp., Cleveland, iron castings, \$5729.76.  
 Adirondack Foundries & Steel Co., (Please turn to Page 44)

## Purchases Under Walsh-Healey Act (Cont.)

Nonferrous Metals and Alloys	Commodity	Amount
Bendix Aviation Corp., Eclipse Machine division, New York	Time fuses	10,218,000.00
C-O-Two Fire Equipment Co., Newark, N. J.	Fire extinguishers	47,208.00
Kidde, Walter, & Co. Inc., New York	Fire extinguishers	13,777.50
Pacific Metals Co. Ltd., San Francisco	Nickel-copper alloy	14,980.00
Revere Copper & Brass Inc., Baltimore	Cartridge cups	751,666.00
Seovill Mfg. Co., Philadelphia	5-cent blanks	107,500.00
<b>Machinery and Other Equipment</b>		
Aldrich Pump Co., Allentown, Pa.	Pumps	\$29,960.00
Allen, H. F., Co. Inc., New York	Drill presses	17,440.00
American Chain & Cable Co. Inc., Wright Mfg. division, York, Pa.	Holsts	38,077.00
American Laundry Machine Co., Cincinnati	Washing machines	10,036.00
American Locomotive Co., Schenectady, N. Y.	Turret rollers	144,978.00
Baldwin Locomotive Works, Standard Steel Works division, Philadelphia	Rollers	146,073.00
Bay City Shovels Inc., Bay City, Mich.	Shovels	32,050.00
Brown & Sharpe Mfg. Co., Providence, R. I.	Grinders	36,362.80
Caterpillar Tractor Co., Peoria, Ill.	Tractors	36,718.64
Chisholm-Moore Holst Corp., Tonawanda, N. Y.	Holsts	15,394.72
Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati	Milling machines	319,431.00
Cincinnati Shaper Co., Cincinnati	Shear machine	10,920.00
DeWalt Products Corp., Lancaster, Pa.	Woodworking machines	12,510.00
Diagraph Bradley Stencil Machine Corp., St. Louis	Stencil machines	10,120.00
Fairbanks, Morse & Co., Chicago	Pumping units	50,950.00
Farrel Birmingham Co. Inc., Ansonia, Conn.	Rolling mill units	53,600.00
Fogel Refrigerator Co., Philadelphia	Refrigerators	42,750.00
Food Machinery Corp., Peerless Pump division, Massillon, O.	Pumps	40,350.00
General Motors Corp., Cleveland Diesel Engine division Cleveland	Engine spares	14,580.30
Hamilton Tractor & Equipment Co., Chattanooga, Tenn.	Tractors	15,433.24
Henzey Co., Watertown, Wis.	Distillation unit	10,840.00
Ideal Stencil Machine Co., Belleville, Ill.	Stencil machines	12,305.00
Lidgerwood Mfg. Co., Elizabeth, N. J.	Deck winch	17,974.00
Little, Arthur D. Inc., Cambridge, Mass.	Distillation units	35,200.00
Lodge & Shipley Machine Tool Co., Cincinnati	Lathes	205,786.00
McCray Refrigerator Co., Kendallville, Ind.	Refrigerators	100,838.50
Morse Chain Co., Detroit	Parts for diesel engines	38,891.25
Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn.	Drilling machines	18,930.00
Seeger Refrigerator Co., St. Paul	Refrigerators	534,655.00
Sellers, Wm., & Co. Inc., Philadelphia	Boring mills	78,730.00
Servel Inc., Evansville, Ind.	Refrigerators	12,724.80
Sidney Machine Tool Co., Sidney, O.	Lathe	12,762.00
Stevens Walden Inc., Worcester, Mass.	Punches and dies	11,418.50
Tayares Construction Co. Inc., Los Angeles	Pile drivers	23,400.00
Warner & Swasey Co., Cleveland	Lathes	28,683.00
Wilson-Brown Inc., New York	Squaring shear	18,325.00
Wilson-Weesner-Wilkinson Co., Knoxville, Tenn.	Tractors	12,587.00

# Windows of WASHINGTON



By L. M. LAMM

Washington Editor, STEEL

## *Steel Priorities Board Expected To Be Named Soon.*

## *Senators in Accord with Millis Appointment.*

## *Export Control Compensation Board Appointed.*

## *500,000 Added to Employment Rolls in October.*

WASHINGTON ■ PRIORITIES committee for the steel industry, expected to be named soon, will not institute compulsory priorities immediately, according to informed sources here. Legal rationing of steel products, with its resultant embarrassment to some steel consumers, is not in prospect, they say.

Purposes of the steel priorities committee will be three: To keep tab on the supply and demand situation; to encourage and supervise voluntary co-operation in assuring an adequate steel supply for defense needs; and to prepare a system of compulsory priorities should the need for such a system arise.

Such committees are functioning well in the machine tool and commercial aircraft industries.

Leading spokesmen for the steel industry insist there should be no general shortage of steel, although they admit tight spots may develop. It will be the purpose of the committee to help smooth out such tight spots.

## **RADICALS QUIT LABOR BOARD AS MILLIS IS APPOINTED**

National labor relations board again became front page news with the nomination by the President of Dr. Harry A. Millis, Chicago, to succeed J. Warren Madden as chairman of the board.

Nomination quickly led to the resignation of Nathan Witt, secretary, Thomas I. Emerson, associate general counsel, and Alexander B. Hawes, chief administrative examiner. All three have been targets of much criticism. Witt's resignation had been asked by Dr. William

M. Leiserson, member of the board, some months ago.

Some senators are trying to reopen question of amending the national labor relations act if congress continues in session.

Dr. Millis' appointment aroused enthusiasm in the senate indicating that he will be promptly confirmed. This gave rise to talk on capitol hill that amendments to the Wagner act, under which the board operates, would get less support than was anticipated because many members of the upper house believe that the board should be allowed to work out its own salvation with a conservative majority in power.

## **SUBCONTRACTORS PLAY LARGE ROLE IN DEFENSE**

Most important job of the national defense advisory commission to date has been to get orders placed and production started on tanks, airplanes, battleships, and other heavy armament requirements of the army and navy, Donald M. Nelson, co-ordinator of purchases, said last week.

"Our first responsibility," he said, "has been to harness the industrial facilities which already were available for the supply of military equipment."

Mr. Nelson discussing the subcontracting situation said: "But back of every assembly line that turns out tanks, bombers, pursuit planes, heavy guns, there is an army of subcontractors, supplying material and parts. For example, in the assembly of a Pratt & Whitney airplane motor, 40 per cent of the parts are supplied by subcontractors. For the average bomber

turned out by the Glenn L. Martin Co., the services of several hundred subcontractors are required—subcontractors located in every part of the country and whose products come from virtually every state in the union. The Douglas Aircraft Co. recently awarded \$75,000,000 worth of subcontracts at one time."

The majority of these subcontractors have been trained to work in groups around certain primary contractors.

## **NAME COMPENSATION BOARD UNDER EXPORT CONTROL ACT**

Col. Russel L. Maxwell, administrator of export control, has announced establishment of a compensation board, organized for the purpose of considering the fair and just compensation to be paid for articles or materials requisitioned.

The export control act, approved by the President Oct. 10, permits the requisitioning of articles or materials vitally needed for the national defense, which are physically available in this country, and the exportation of which has been denied, but because of contractual obligations or title transfer to foreign holders cannot be released for use in the domestic rearmament program.

The compensation board, whose chairman is Gen. Edwin D. Bricker, will hear all evidence relating to the financial aspects of each requisitioning case, and make recommendations to the administrator of export control as to the proper amount due the owners of the requisitioned articles or materials.

Col. Maxwell announced the board consists of the followigg, in addition to General Bricker: Col. Henry W. T. Eglin, Lieut. Col. Charles N. Trammell, and Col. Francis R. Kerr.

## **HILLMAN OFFERS EXECUTIVE TRAINING PROGRAM OUTLINE**

Training program designed to strengthen and expand managerial organizations through increasing responsibility in junior executive and supervisory positions was outlined



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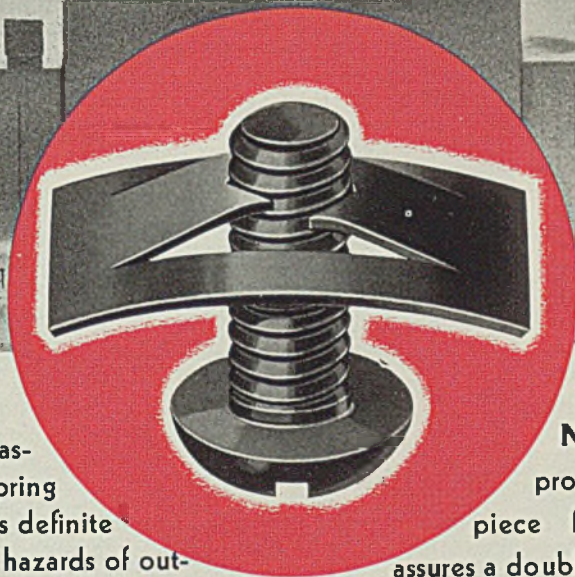
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The SPEED NUT assembly system of spring tension fastening offers definite protection against the hazards of out-moded assembly methods.

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Check every assembly location on your product now and adopt SPEED NUTS or Speed Clips wherever possible.

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IN CANADA: Wallace Barnes Co., Ltd., Hamilton, Ontario. IN ENGLAND: Simmonds Aerocessories, Ltd., London. IN FRANCE: Aerocessoires Simmonds, S. A., Paris.



OVER 900 MILLION ALREADY USED—OVER 700 SHAPES AND SIZES



last week by Sidney Hillman, commissioner in charge of the labor division, national defense advisory commission.

The program is based on an underlying policy of planned development of all supervisory agents. Emphasis on qualities of leadership; full information as to company policies in all fields, particularly industrial relations policy; delegation of sufficient authority to responsible executives; planned transfers and rotations in office; encouragement of professional development; fair and just relationships in status and pay between supervisor and worker; salary increases based on performance; and elimination of nepotism, make up the main features.

Outline for expanding managerial organization deals with increasing responsibility of present supervisors. Under this program eight to ten weeks are required to select and train supervisors through the four stages of elementary supervision, intensive instructions, more difficult and responsible work, and complete responsibility.

#### U. S. EMPLOYMENT SERVICE PLACES 305,000 IN MONTH

Placements of workers in private industry by United States' employment service rose to 305,000 during September, approaching the all-time high established in October, 1939, according to Paul V. McNutt, federal security administrator. With an estimated total gain in private employment of 500,000 during the month, the employment service was directly responsible for filling about 60 per cent of all openings in private industry during this period.

As employment increased, number seeking jobs through state employment offices dropped to approximately 4,900,000, according to the social security board's report to Mr. McNutt. Number receiving unemployment insurance benefits and total paid declined for the second successive month.

Total benefit payments in September decreased 29 per cent to \$36,600,000, lowest since December, 1939. Continued claims for benefits filed by unemployed decreased 28 per cent during September with a minimum of 1,000,000 receiving at least one benefit payment and a weekly average of 875,400 recipients. Sharpest declines generally occurred in leading industrial states, Michigan reporting most pronounced drop.

Gain in private placements by the employment service in September was 9 per cent above the previous month and 6 per cent higher than in September, 1939, previous highest September in history of the service. New record of 278,000 supplemental placements, mostly agricultural, reflected the peak demand

for workers in harvesting. Employment offices also made 47,000 placements in public and governmental service.

#### IRON, STEEL INVENTORIES HIGHER IN SEPTEMBER

Value of iron and steel industry and their products inventories for September was 121.2 compared with 120.1 in August and 102.5 in September of last year, taking Dec. 31, 1938, at 100, according to the monthly industry survey of the department of commerce.

Index of value of new orders received by iron and steel industry for September was 198 compared with 140 in August and 249 in September of last year, taking January, 1939, at 100.

Index of the value of iron and steel shipments in September was 180 compared with 163 in August and 150 in September of last year, taking January, 1939, at 100.

In iron and steel industry there was an increase of unfilled orders in September from August of 12 per cent compared with an increase of 1 per cent in August from July and an increase of 9 per cent in September of this year compared with the same month of last year.

A strong upsurge in new business carried the department of commerce new orders index to a 1940 high in September. Although manufacturers' shipments were the largest for the two-year period covered by the survey, the flow of incoming business during the month was sufficient to raise unfilled order backlogs by 18 per cent. This was the sharpest rise recorded in unfilled orders during any month this year.

#### Increase Is General

The volume of new orders for all industries in September was 25 per cent larger than the high August total, and approximately equal to the peak of the buying wave last autumn. The durable goods industries with an increase of 30 per cent over August set the pace, but a better than 20 per cent rise in incoming business in the nondurable goods lines reflected the general character of the advance.

Shipments in September rose abruptly, increasing 17 per cent over August. The sharp rise from August resulted partly from factory shipments of automobiles, which more than doubled as production of new models was rapidly stepped up. Even without the automobile industry, however, shipments rose 12 per cent. This gain was about equally distributed between the durable and nondurable goods industries. Deliveries of durable goods exceeded the volume of the peak month of last fall for the first time this year, while the nondur-

able lines equalled the high point of last September.

Manufacturers' inventories showed little evidence of general accumulation in September. Although the value of stocks increased by a little more than 1 per cent during the month, the major part of this rise may be accounted for by a seasonal expansion of stocks in the automotive industry. A moderate rise in the other durable goods industries was in large part offset by a decline in the nondurable goods field.

#### FTC REPORT PRESENTS DATA ON AIRCRAFT INDUSTRY

*Aircraft Manufacturing Corporations* is first report released in the federal trade commission's project of collecting financial and other information from a large number of corporations operating in United States' principal industries.

Nine aircraft manufacturers, whose financial reports are combined, represent the most important concerns in the industry from standpoint of investment, value of goods sold and workers employed. Information was obtained from reports submitted by the corporations covering 1939 operations and from annual reports of public record for 1938.

Exhibits with respect to sales, costs and expenses, investment employed, profits, dividends and operating ratios presented in the report, show the nine companies' total sales in 1939 were \$255,004,218, compared to total of \$171,016,224 in 1938. Increase in sales was 49.1 per cent. Costs applying to goods sold in 1939, or total operating expenses (including raw materials, wages, taxes, depreciation, other charges) were \$208,787,934, against \$145,434,398 in 1938.

Combined net income of the nine corporations before payment of income taxes for 1939 totaled \$45,405,826 on an average investment of \$131,827,219. This represented an average rate of return of 34.4 per cent for the group. Individual rates of return ranged from a loss of 60.5 per cent for one corporation to a gain in rate of return of 98.8 per cent for another. Rate of return on average of \$112,375,309, capital employed during 1938, was 24.2 per cent.

The nine corporations realized a net income, after provisions for payment of income taxes, amounting to \$35,663,658 in 1939, and \$21,872,031 in 1938. They paid cash dividends aggregating \$11,361,178 in 1938 and \$20,194,804 in 1939. Dividends represented a return of 10.2 per cent and 15.4 per cent, respectively, to stockholders when related to ledger value of their equity.

Total 1939 net sales of seven of the corporations were \$181,534,013.

## Machine Tool Operating Rate 96.8 in October

Machine tool industry's rate of operation in October was 96.8 per cent of estimated capacity, according to the National Machine Tool Builders' association, Cleveland. This compared with operating rate of 84.9 per cent in October last year and 94.9 per cent in September, 1940.

Total output last month was double that of the period in 1939, according to Frederick V. Geier, president of the association and president, Cincinnati Milling Machine Co., Cincinnati. The industry's capacity, he said, continues to increase, was 50.3 per cent greater last month than in September, 1939. "The industry is meeting the country's defense needs by increas-

ing operating schedules and by extensive plant expansion," declared Mr. Geier. "The industry's productive capacity has been substantially increased in the past year by these four steps: (1) addition of floor space; (2) installation of more equipment and better utilization of existing equipment; (3) by increased employment and employe training; and, (4) by subcontracting parts to qualified machine shops."

A special program keyed to the theme of steel and its workers will be broadcast over the National Broadcasting Co.'s red network Dec. 9 on the Carnation "contented hour." The orchestra, chorus and soloists will join in a musical salute to the steel industry and a commentator will describe steel's traditions and progress.

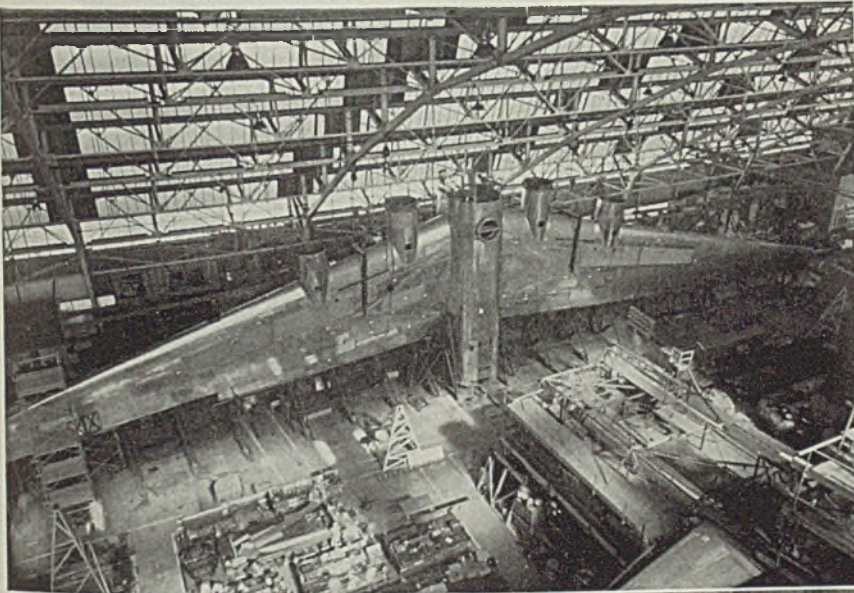
## October Electric Truck Bookings at New Peak

Bookings of electric industrial trucks and tractors in October, 1933 units, were substantially higher than in any previous month this year. Last month's total, according to the Industrial Truck Statistical association, Chicago, compared with bookings of 154 units in September.

Total net value at factories for chassis only, in October, was \$653,682.20. Previous high in aggregate value was last July's \$591,784.44. Bookings included 22 nonelevating platform trucks, 147 cantilever trucks, 8 tractors, 15 crane trucks and one special non-load carrier truck.

Further details on the report may be secured from the association, 208 South La Salle street, Chicago.

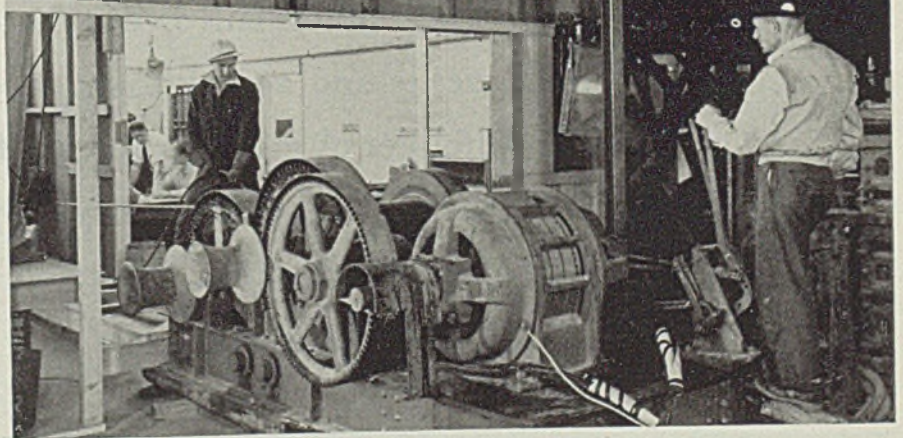
## Bridge Experts Direct Assembly of Huge Army Bomber



Left, the wing section ready to be lifted from its cradle; below, one of the winches used in the turning operation

So huge is the 80-ton B-19 bomber being built by Douglas Aircraft Co. at Santa Monica, Calif., that a technique new to the aircraft industry had to be devised for its assembly. The 212-foot, 34,000-pound wing and center fuselage section was assembled in one piece in vertical position in a steel jig more than 48 feet high. Nose and tail sections were constructed in normal horizontal position in front and behind the wing jig. The wing had to be lifted from its cradle and turned into horizontal position for splicing to tail and nose sections.

Bridge erection experts from Bethlehem Steel Co. were called in to evolve a plan. Thorough tests were made with a model plane and miniature wires and pulleys. When satisfied their calculations were correct, the engineers connected two

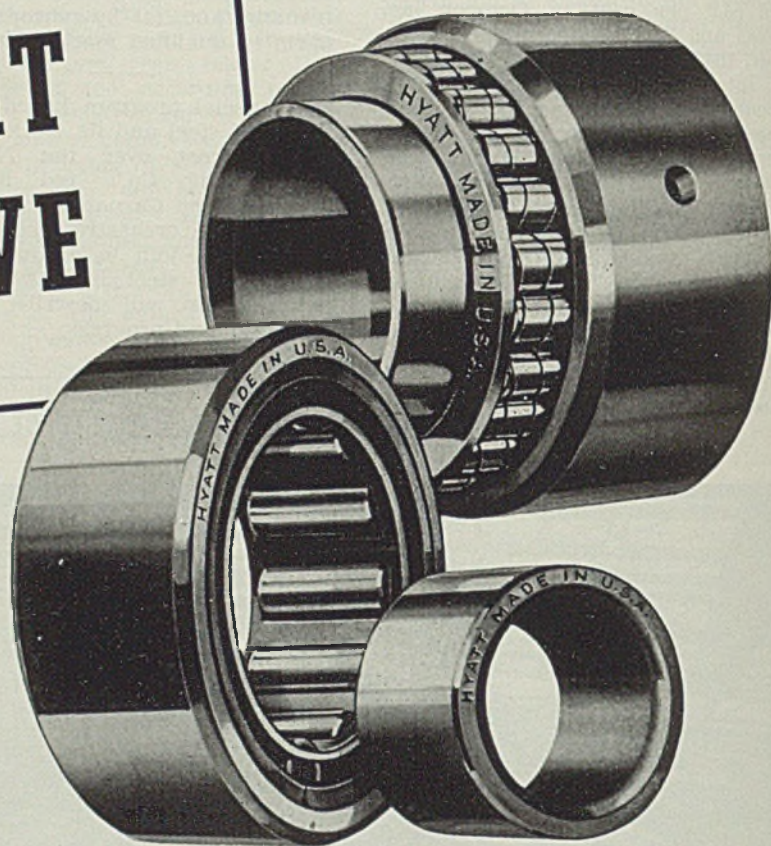


electric winches with the wing by cables running through pulleys in the rafters, lifted the huge wing from its cradle and lowered it into

position. So accurate were the calculations that none of the three sections had to be realigned for joining.

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HYATT WOUND ROLLER TYPE AND HY-LOAD SOLID ROLLER BEARINGS shown opposite. Inherent design advantages, uniformity and accuracy, along with their capacity for heavy loads, account for the widespread application of these better bearings.



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**HYATT** *Roller* **BEARINGS**

# Mirrors of **MOTORDOM**



By A. H. ALLEN  
Detroit Editor, STEEL

*Automakers Seeking Coverage on Steel to Next August.*

*Mills Reluctant To Sell at Current Prices Beyond 90 Days.*

*Fourth Quarter Car Production May Establish Record.*

*Ford Will Add Two More Small Village Industries.*

## DETROIT

■ AS NOVEMBER wanes, motor companies are putting the pressure on their purchasing departments to cover on parts and material for the balance of the model year—roughly to Aug. 1. So insistent are the buyers becoming that representatives in sales offices here almost dread to answer the telephone, because “no” is one of the most difficult words they can utter.

But “no” it usually is on requests for coverage at present prices beyond 90 days. A supplier of bolts and screws has covered customers here to April 1 on normal requirements. Orders for steel to be shipped in first quarter are being taken, with price as of date of shipment. Chrysler is asking coverage on a wide range of parts and materials to Aug. 1 at present prices—and is not having much success in getting it.

Authorizations are going out to many suppliers, including body manufacturers, to cover on steel and other materials for the balance of the model year. But this is more easily said than done. Mills are now booked up to the ears, and with only a few exceptions deliveries are greatly extended. It is believed, however, that after the turn of the year, the pressure may ease up a trifle on steel, particularly when the requirements of the many new plants now being erected are filled.

An additional possibility is that auto production may taper off appreciably after the first of the year. One reason, among many, for suspecting this eventuality is the fact that strong efforts are being made to drive in sales even now. In a Detroit factory branch, customers are being quietly taken aside and told

that after the first of the year a \$50 defense tax is going to be slapped on all new car sales.

Whether this is true or not, the threat should not be necessary if retail demand were actually booming. On top of it, add talk of long trades, of used car congestion, and of slow moving lines, and a picture of faltering sales is not hard to construct.

Factory production, of course, continues extra strong, and even the interruption last week occasioned by the holiday could not make a serious dent in anticipation for a record eleventh-month total, now thought to be somewhere around 475,000. Total for the fourth quarter may come close to 1,500,000, which would break all existing records for this three-month interval.

## Runs in Three-Year Cycles

Looking ahead to 1941, two possibilities suggest themselves, in view of the industry's experience over the last 20 years. In these two decades, including periods of peak prosperity and the severest of depressions, the rule of the three-year cycle has prevailed continuously. According to this interpretation, 1940 was the third year of a cycle starting with the low of 1938. Thus 1941 either will drop to a new base for a three year climb (or three-year drop) or it will establish a new high base as in 1935, with 1942 and 1943 showing still further slight increases in auto output.

Take your choice of these possibilities. It is this observer's opinion that under the weight of the de-

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fense program, auto production will start to sag in 1941 and continue easing off in 1942 and 1943. Forecasting, particularly since the election, admittedly has come to be a dangerous, if not foolhardy, profession, so the prediction just made should be sprinkled liberally with salt.

■ TWO more beads will be added to the Ford necklace of village industries by the first of the year. One is the Willow Run plant, two miles east of Ypsilanti along the stream for which it was named, which by Dec. 1 will be in production on door and ignition locks. The other is at Manchester, 12 miles southeast of Ann Arbor, where instrument panel “clusters” will be assembled after Jan. 1.

These two new units bring to a total of 18 the number of such village plants producing small parts for the parent Ford Rouge plant. They mark another milepost in the experiment started in 1918 by Mr. Ford when he established the first plant at Nankin Mills to help close the gap between farm and factory and also to help decentralize his mass production operations.

In striking contrast to the vast Rouge plant, each of the village industries occupies a small building in a picturesque setting on rural water-power sites within 50 miles of the main plant. Many of them occupy rehabilitated grist mills, built in the pioneer days. The Willow Run plant, adjacent to a lake created by the plant dam, is a two-story brick and concrete structure, the main section 20 by 50 feet, with an “L” joining the north portion and housing the water power turbines. Personnel includes 35 young men from neighboring farms and towns. Output normally will run to about 3000 locks a day.

The plant is a model of compactness and efficiency. It boasts a small brass foundry with electric furnaces on the first floor where metal is melted and poured into molds. These castings, which later become the body of the lock, are milled on the

second floor. Even the small tumbler pins are made at the plant. Electric power is provided by twin water wheels of 10-horsepower capacity each.

The Manchester plant will employ 125 in manufacturing of parts and assembly of panel clusters—grouping of oil pressure, fuel, generator and water gages in the panel. It will have normal capacity of 2500 clusters daily and will be powered by a 50-horsepower water wheel.

Output of these plants by no means takes care of the company's full requirements for the product. But the advantages of such small plants—to their communities, to the workmen, and to the company are so definite that Mr. Ford has steadily increased the scope of the village industry program which will be extended as rapidly as suitable sites are found.

The Ford plastic program, commented upon at various times in this department, was the subject of a sensational article in a national magazine recently which drew wide attention, especially around Detroit. Some of the statements presented as facts caused eyebrows to lift in doubtful amazement, such as the observation that a 1000-ton press about the size of a ten-story building had been installed for plastics experiments; that the Ford plastic was superior to steel in everything but tensile strength, was 50 per cent lighter, 50 per cent cheaper, ten times stronger; that Ford will not use the plastic for frame, chassis or motor blocks; that steelmakers are worried and recently sent a research committee to Dearborn to investigate.

**Steelmakers Not Worried**

If plastic panels can be developed to the point where they are superior to and at least as cheap as steel, obviously they will be used in motor cars. But steelmakers are a long ways from being much worried over the possible substitution. What they may be worrying about is how soon "low-price" sheet and strip will be shipped out; whether prices will be reaffirmed for first quarter; how soon lengthening deliveries, even on sheet and strip, will return to normal and how to keep salesmen busy these days when they must turn business away.

Some realignments in motor car body business may eventuate from congestion caused by the defense program. Briggs Mfg. Co. is bidding on a lot of 50,000 Packard bodies, equivalent to the total output of Packard in the first nine months of this year, giving rise again to the possibility that Packard may close down its body stamping plant in the interest of space and men for airplane engine manufacture. Briggs has been supplying a few of the Packard bodies, production being

**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
9 mos....	1,642,520	2,570,370	3,160,060
Oct.....	215,286	324,688	.....
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†
Oct. 26 .....	117,080	78,210
Nov. 2 .....	118,092	82,690
Nov. 9 .....	120,948	86,200
Nov. 16 .....	121,943	86,700
For week ended Nov. 23 see page 29.		

†Comparable week.

centered in the Meldrum avenue plant.

Graham has discontinued automobile manufacture, and its entire plant will be given over to defense projects. Hupp Motor Car Co. plants, now in receivership, are seen as a likely spot for concentration of more defense work, except that little equipment is available of the type suited to this work.

Newspaper reports have stated Buick may launch production of Pratt & Whitney aircraft engines, of the type which Ford now is tooling up for. Such a development probably would require construction and equipping of an entire new plant and at present is considered fairly remote by those who have privately queried Buick production men. The suggestion has been heard that Buick may produce key parts for the engine and ship them East for assembly by P & W. There would be many complications in this plan, however. Buick representatives are known to have visited the P & W plants in West Hartford, but any plans for actual production in Flint appear hazy at the moment.

As predicted several months ago in these pages, Cadillac has announced the availability of a Cadillac-engineered Hydra-Matic drive on 1941 models. Identical in principle with the successful Olds, automatic drive, the Cadillac version is larger in size in keeping with the larger size of the car. A total of 981 separate parts is involved in the complete transmission, coupling and control assembly.

■ CHRYSLER engineers have developed a new type of gasket ma-

terial, compounded of lignin plastic and Neoprene, synthetic rubber produced by Du Pont. The material has a high resiliency and maintains pressures better than previous material such as cork used on certain gaskets where temperatures under 500 degrees are involved. Called Ligno-Neoprene, the new material is being used on current production for gaskets in rear axles, transmissions, tappet covers and some other motor parts. Although more expensive than cork, the gasket is produced from materials originating entirely within this country and has the advantage of small scrap loss. Gaskets are cut before the material is cured or vulcanized; hence waste material can be returned to the original batch and used over again. Ligno-Neoprene is being produced in thicknesses ranging from 0.015 to 0.025-inch.

Chrysler Corp., incidentally, has leased 600,000 square feet of floor space in the main plant of Graham-Paige for an undisclosed phase of defense work.

**REPORTS ON AUTOMOBILE PARTS AND ACCESSORIES**

The report on *Automobile Parts and Accessories Manufacturing Corporations*, seventh in the federal trade commission's project for collection of annual financial reports from a large number of industrial corporations, has just been made public.

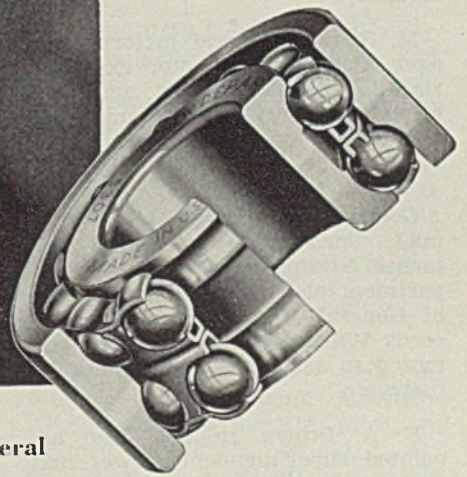
The 19 manufacturers whose financial reports are combined represent the most important in the industry from the standpoint of investment and value of goods sold.

Combined net sales for 1939 amounted to \$563,770,843, an increase of 29.9 per cent over 1938.

The combined net income, before deduction of interest on long-term borrowings and income taxes, on the total capital of \$369,606,757 in 1939, was \$53,460,717, or a rate of return of 14.5 per cent on the average of such total employed capital for the year. In comparison, the rate of return on the average capital during 1938 was 1.9 per cent. The average rate of return for this industry group for 1939 on the total investment represented individual rates ranging, low to high, from a loss of 6.9 per cent to a gain of 25.6 per cent.

Ten of the 19 corporations had rates of return for 1939, that were higher than the average for the group, and the rates for these ten corporations ranged from 14.6 per cent to 25.6 per cent. Five of the remaining nine corporations had rates of return ranging from 4.4 per cent to 10.5 per cent. Three of the corporations showed rates ranging from 1.0 per cent to 3.1 per cent, while the other corporation showed a loss.

*Like a ONE MAN BAND  
... this multi-purpose  
bearing*



● The New Departure Double Row bearing is an *expert* at doing several jobs *well*—at the same time.

It resists radial and thrust loads in *any combination*, with thrust in either direction or reversing . . . provides extremely rigid support under pure radial loads.

It resists misalignment so positively, that in many cases it may be used alone, without need for a second or supporting bearing.

It is a compact, internally preloaded *unit*, applicable in numerous instances *without* need for shaft threads or locknuts.

Here is a truly versatile bearing. Use it to simplify your design. Let it help to save you money and build a better product.

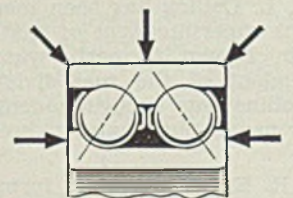
29-11

# NEW DEPARTURE

## THE FORGED STEEL BEARING

NEW DEPARTURE - DIVISION OF GENERAL MOTORS - BRISTOL, CONNECTICUT - DETROIT - CHICAGO

November 25, 1940



### TWO JOBS — ONE BEARING

Big advantages in economy of manufacture and machine performance result from the use of the Angular Contact Double Row ball bearing which was originated by New Departure to resist both radial and thrust loads.

Today automobiles, trucks, tractors and machinery of many kinds depend upon bearings developed by New Departure from this original dual purpose "new departure."

# MEN of INDUSTRY

■ C. E. HARRISON, vice president, American Engineering Co., Philadelphia, has been appointed general manager.

E. W. Sharninghausen, since 1918 purchasing agent of the company, has been promoted to treasurer. He will continue to serve as director of purchases.

Frank E. Flynn, general manager for Republic Steel Corp. in the Warren-Niles, O., district, is the new president of the Trumbull Manufacturers' association.

W. H. Lutz is now associated with Seneca Steel Service Inc., Buffalo. He formerly was identified with the Buffalo office of Youngstown Sheet & Tube Co.

Frank Oppenheimer, formerly chief engineer, Apollo Steel Co., Apollo, Pa., was recently appointed general superintendent. He succeeds the late Howard C. McGaughey.

M. Rogers, general factory manager, Caterpillar Tractor Co., Peoria, Ill., will resign Dec. 1, and plans an extended visit to California. The position of general factory manager will be discontinued.

George T. Mahaney has been made production manager attached to the sales promotion department of Pontiac Motor division of General Motors Corp. He succeeds William Miller, recently promoted to assistant sales promotion manager.

E. A. Brown Jr. has been appointed superintendent, power and fuel division, Gary, Ind., works of Carnegie-Illinois Steel Corp., and F. L. Collins has been made assistant superintendent of that division. Mr. Brown formerly was superintendent of the fuel division. Mr. Collins was superintendent of power production, maintenance division.

R. E. W. Harrison, formerly vice president, Chambersburg Engineering Co. and of Clarke-Harrison Inc., Chambersburg, Pa., has resigned to accept an appointment in the office of the assistant secretary of the navy, Washington, with the rank of lieutenant-commander.

Frank Huston, formerly vice president, Donner Steel Corp., Buffalo, has been elected president, general manager and a director, Barium Stainless Steel Corp., Canton, O. Admiral Charles Conrad,



C. E. Harrison



E. W. Sharninghausen



E. A. Brown Jr.

Washington, has been elected chairman of the board.

The Barium corporation also announced resignation of J. A. Sisto as president, chairman and a director, and F. G. Norsworthy as a director.

T. Yancy Milburn, consulting en-

gineer, Washington, has been elected vice president and a director; Sam Tour, vice president, Lucius Pitkin Inc., New York, and Jules R. Bruechard, vice president, Underpinning & Foundation Co., New York, have been elected directors.

John Dykstra, formerly general superintendent of production, Olds Motor Works, division of General Motors Corp., has been named assistant works manager, and Roy A. Fishel, superintendent of the six and eight motor plants, becomes night superintendent.

B. C. Heacock, president, Caterpillar Tractor Co., Peoria, Ill., and N. O. Pedrick, president, Mississippi Shipping Co., New Orleans, have been elected directors, Illinois Central railroad, Chicago. They succeed the late L. A. Downs, president of the road, and the late A. D. Geohegan.

Leon R. Ludwig has been appointed manager of two newly combined sections of Westinghouse Electric & Mfg. Co.'s switchgear division at East Pittsburgh, Pa. Mr. Ludwig, heretofore manager of protective devices engineering the past five years, will head the combined division of circuit breaker and protective devices engineering.

Dr. W. D. Coolidge and Stuart M. Crocker have been elected vice presidents, General Electric Co., Schenectady, N. Y. Dr. Coolidge will continue as director of the company's research laboratory in Schenectady, while Mr. Crocker will relinquish his duties as manager of the air conditioning and commercial refrigeration department at Bloomfield, N. J., and will make his headquarters in New York.

## Metals Society Sponsors Quiz in Metallurgy

■ A metallurgical "information please" program conducted by the Chicago chapter, American Society for Metals, Nov. 14, attracted a record-breaking attendance. The experts missed few answers to tricky questions submitted by society members not only in the Chicago chapter, but chapters throughout the country.

For each question submitted and accepted for use, \$2 was paid; if the experts failed to supply correct answers, the proposer received his

STEEL



choice of a \$5 book published by the national society.

The program was organized under the general direction of W. D. McMillan, works metallurgist, International Harvester Co. Dr. M. A. Grossmann, director of research, Carnegie-Illinois Steel Corp., was master of ceremonies.

Comprising the board of experts were: J. Walter Scott, metallurgical engineer, Western Electric Co.; Roy G. Roshong, chief metallurgist, Lindberg Steel Treating Co.; H. B. Knowlton, metallurgical engineer, International Harvester Co.; John L. Burns, superintendent of wire division, Republic Steel Corp.; and Walter E. Remmers, district manager, Electro Metallurgical Sales Corp.

Sound effects and the cash register for paying off were handled by K. H. Hobbie, district manager, Driver-Harris Co.

Approximately 300 questions were submitted, of which 35 were used. Only five answers were missed by the experts, and in these the errors were mostly in one part rather than the entire question.

## \$200,000 Coal Research Program Inaugurated

Bituminous Coal Research Inc., research agency sponsored by the National Coal association, has announced the inauguration of a \$200,000 research program designed to advance the competitive position of coal by the development of better equipment for its use. The program will be carried on at Battelle Memorial institute, Columbus, O.

The plan will include studies of methods by which close control of

heating and smokeless operation may be combined with the natural advantage of coal as a low-cost source of energy. Direct application of coal as a fuel for metallurgical and ceramic furnaces, methods for the complete gasification of coal for industrial and residential use, and the direct conversion to mechanical energy through the use of coal in a new-type internal combustion engine are among the other problems to be studied.

## Died:

■ RICHARD C. COOMBS, 80, associated with the sales department of Inland Steel Co., Chicago, 25 years, until his retirement in 1936, Nov. 17, at his home in Oak Park, Ill.

Albert H. Tippens, 45, vice president and sales manager, Felt & Tarrant Mfg. Co., maker of adding and calculating machines, Chicago, at his home in Winnetka, Ill., Nov. 15.

Ben-Allen Samuel, 73, Chicago district sales manager, Upressit Products Corp., New York, manufacturer of pressed metal can and bottle tops, at his home in Hinsdale, Ill., Nov. 17.

Charles F. Hopkins, vice president and works manager, Ajax Metal Co., Philadelphia, Nov. 13. He was associated with Ajax about 40 years, and was a past president, Philadelphia chapter, American Foundrymen's association.

L. M. Moore, 65, superintendent, Harrison, N. J., plant of Otis Ele-

vator Co., at his home in Irvington, N. J., Nov. 15.

Alfred B. Potterton, 73, treasurer, United States Gauge Co., New York, in Glen Ridge, N. J., Nov. 7.

James M. Stannard, 76, president, Stannard Power Equipment Co., Chicago, in Evanston, Ill., Nov. 4.

Herman W. Koerner, 79, president, Universal Wire & Iron Co., Milwaukee, in Milwaukee, Oct. 27.

George H. Eddy, 79, treasurer, Nash-Kelvinator Corp., Kenosha, Wis., in that city, Nov. 1.

Wendelin P. Seng, 67, vice president, Seng Co., manufacturer of furniture hardware, Chicago, in that city, Oct. 29.

Harry H. Rowell, 70, a director and for many years a salesman, Rowell Farm Implement Co., Waukesha, Wis., in Waukesha, Oct. 30.

Arthur W. Osborne, 57, the past ten years production chemist, A. O. Smith Corp., Milwaukee, recently, in that city.

Charles Fred Morley, 56, authority on manufacture of munitions and president of Morley Machinery Corp., Rochester, N. Y., Oct. 31, in Rochester.

Edmund Lang, 60, until last year president, Crocker-Wheeler Electric Mfg. Co., New York, recently. He was a director of Crocker-Wheeler, Curtis Gas Engine Co. and Remington Arms Co.

John W. Kershaw, 75, retired foundry superintendent, Michigan Alkali Corp., Wyandotte, Mich., in Plymouth, Mich., Nov. 11. He served with Michigan Alkali 18 years, retiring in 1936.

Isaac Kaden, 59, president and treasurer, H. Kramer & Co., Chicago, smelter and refiner of metals, in Chicago, Nov. 13. He had been associated with the company 35 years.

Ellis B. Beeman, Oct. 25, at his home in Windsor, Ont. Mr. Beeman was associated with Standard Fuel Engineering Co., Detroit, many years, and was widely known among heat treaters and power plant operators.

E. H. Benford, 46, secretary-treasurer, Benco Mfg. Co., Cleveland, Oct. 5, in Cleveland. He had been with the company since 1925 and before that was with National Acme Co., Cleveland.

## New Diesel Towboat for Wheeling Steel



■ This 760-horsepower diesel towboat, the DUCTILLITE, recently was delivered to Wheeling Steel Corp., Wheeling, W. Va., by Dravo Corp., Pittsburgh. It is a new type of river towboat

# Activities of Steel Users, Makers

■ COLUMBIA Axle Co., Cleveland, has been purchased from the Aviation & Transportation Corp. by Walter E. Schott and Louis Goldsmith, Cincinnati manufacturers. Mr. Schott is president, J. H. Fay & Egan Co., woodworking machinery. Mr. Goldsmith is the owner of the Hisey-Wolf Machine Co., portable electric tools and grinders. Roy H. Faulkner will continue as Columbia's president and general manager.

Tubular Service Corp., Brooklyn, N. Y., has opened a branch office and warehouse at 2117-2123 Reading road, Cincinnati. J. M. Corcoran, formerly associated with the corporation's New York branch, has been transferred to take charge of the Cincinnati office, and J. M. Byers, who has been in charge of sales in that district, will continue in that capacity.

Hill-Chase & Co., Philadelphia, has moved its offices to new quarters at Trenton avenue and Ontario street.

Detroit Rex Products Co., Detroit, has moved its Chicago office to larger quarters at 1166 West Cermak road.

Boyar-Schultz Corp., Chicago, maker of tools, dies and machine parts, recently completed an expansion program which has added 4500 square feet and brought total space to 30,000 square feet. During the past year, production capacity was increased between 5 and 10 per cent by installation of new machinery.

American Air Filter Co., Louisville, Ky., states that press reports of its purchase by a large electrical manufacturing company were premature. Negotiations which never advanced beyond the preliminary stage have been abandoned by mutual consent.

General Electric Co., Schenectady, N. Y., has booked an order for electric equipment from Nantahala Power & Light Co. for installation in new hydroelectric power stations to be erected at Nantahala and Glenville, N. C. Equipment consists of two 27,000-kilovolt-ampere, 150,000-volt, three-phase transformers, and a 54,000-kilovolt-ampere vertical waterwheel driven generator, with a motor-generator exciter set, for Nantahala, and four 9000-kilovolt-ampere, 150,000-volt, single-phase transformers at the Glenville station.

Bendix Aviation Corp., South

Bend, Ind., has withdrawn from the home appliance field to give increased attention to national defense orders. The company has sold its minority interest in stock of Bendix Home Appliances Inc. to Atlas Corp., and Allen & Co., New York. Edwin R. Palmer, vice president and treasurer, who represented the company on the appliance company board, has resigned.

McKenna Metals Co., Latrobe, Pa., has completed arrangements under which United States Steel Export Co., New York, will sell Kennametal tools, tool blanks, drawing dies and wear-resisting parts to foreign markets. The arrangement does not affect the sales agreement in effect with George H. Alexander Machinery Ltd., Birmingham, England, nor does it affect the manufacture and sale in Canada by Kennametal of Canada Ltd., Hamilton, Ont.

Anker-Holth Mfg. Co., Port Huron, Mich., maker of cream separators, hose reels and sprinkler nozzles, has acquired the Air Grip Chuck Co., Detroit, maker of devices for holding metal by air pressure during lathe machining operations. Production of the latter company will be transferred to Port Huron immediately. George Birkenstein, president, George Birkenstein Corp., Chicago, nonferrous metal interest, is also president of Anker-Holth (STEEL, Sept. 9, p. 40).

## MEETINGS

### TO DISCUSS STEELMAKING PROBLEMS AT PITTSBURGH

■ FALL MEETING of the Pittsburgh open-hearth committee, sponsored by the national open-hearth committee of the A.I.M.E., will be held at the bureau of mines auditorium, Pittsburgh, Nov. 29. The afternoon session will deal with "Open-Hearth Construction and Operation" and the evening session with "Basic Open-Hearth Steel Metallurgy."

### WAREHOUSE OPERATORS TO MEET IN SAN FRANCISCO

American Steel Warehouse Association Inc. will hold its thirty-second annual convention in Fairmont hotel, San Francisco, May 12-14, 1941. A special train will be made up at Chicago for those planning to attend from the East and Middle West.

### SOCIETY WILL APPRAISE SCIENTIFIC MANAGEMENT

Society for the Advancement of Management (formerly the Taylor

society and the Society of Industrial Engineers) has arranged a commemoration conference Dec. 5-6 at Hotel Pennsylvania, New York, 25 years after the death of F. W. Taylor. Papers and discussions will center on problems of business management and public administration in a period of industrial preparedness.

### KNUDSEN TO SPEAK AT N.A.M. CONFERENCE

The Fifty-fifth annual congress of American industry, sponsored by the National Association of Manufacturers will be held in the Waldorf-Astoria hotel, New York, Dec. 11-13. W. S. Knudsen, member of the national defense advisory commission, will be the principal speaker at the annual dinner. Preceding the congress is a two-day session, Dec. 9-10, of the National Industrial council, at the Waldorf-Astoria.

## Convention Calendar

Dec. 2-6—American Society of Agricultural Engineers. Semiannual meeting, Hotel Stevens, Chicago. Raymond Olney, St. Joseph, Mich., is secretary.

Dec. 2-6—American Society of Mechanical Engineers. Annual meeting, Hotel Astor, New York. C. E. Davies, 29 W. 39th street, New York, is secretary.

Dec. 2-7—Power and Mechanical Engineering. Fourteenth national exposition Grand Central Palace, New York. C. F. Roth, Grand Central Palace, New York, is manager.

Dec. 3—Illinois Manufacturers' association. Forty-seventh annual banquet, Hotel Stevens, Chicago.

Dec. 11-13—National Association of Manufacturers. Annual meeting, Waldorf-Astoria hotel, New York. Noel Sargent, 14 W. 49th street, New York, is secretary.

Dec. 11-15—American Chemical Exposition, Hotel Stevens, Chicago. Under auspices of Chicago section, American Chemical society. Dr. C. L. Parsons, 728 Mills building, Washington, is secretary.

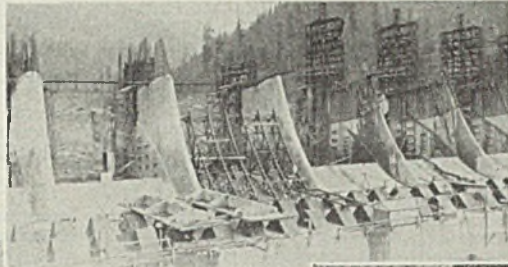
Dec. 12—Grinding Wheel Manufacturers association. Annual meeting, Claridge hotel, Atlantic City, N. J. Harry B. Lindsay, 27 Elm street, Worcester, Mass., is secretary.

Dec. 26-28—American Marketing association. Semiannual meeting, Hotel Stevens, Chicago. Albert Haring, school of business, Indiana university, Bloomington, Ind., is secretary.

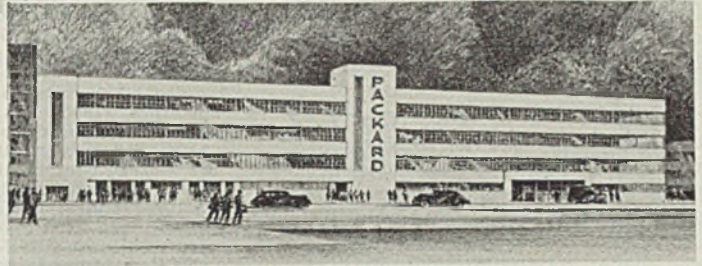
## Rename Gas Sections

■ By a vote of its membership, the American Gas association, New York, has adopted an amendment to its constitution changing the names of the commercial and industrial gas sections. Hereafter the former will be called the residential section and the latter has been named the industrial and commercial gas section.

There has been no change in the scope of either section's activities.



■ Study of structural steel distribution over the past several years gives an impression of three distinct classes of construction in the New Deal era. First, small buildings, in which postoffices predominated; second, dams; third and latest, buildings for defense operations



## New York State Takes 21% of Structural Shapes; California 13

■ NEW YORK has led all states in consumption of fabricated structural steel for the past two years, according to a study by STEEL. The Empire state took 21½ per cent of the total in 1940, up to the middle of November, and 19½ per cent for the entire year, 1939.

In both years California was second, at 13 per cent so far this year and more than 9 per cent in 1939. Pennsylvania which was in third place this year, with 6½ per cent, was in fifth position last year at 5½ per cent. Illinois, which stands fourth this year with 5 per cent, was in third place last year.

Some shifting in structural steel demand occurs each year as new national and world conditions dictate an altered economy. Thus in 1939 the new movement was the building of engineering projects such as huge dams under WPA or other auspices, the purpose being to give work to the idle and better harness our national resources.

On the other hand, 1940, at least the latter half, has been devoted to building a national defense, the first phases of which have been the construction of new factories and additions to old. Methods of modern war have taught the United States to decentralize industry and build plants in the interior, away from seacoasts and national boundaries and dangers of bombing.

In the earlier years of the New Deal the emphasis was on public buildings for peace uses, such as post offices, court houses and other governmental buildings.

In 1941 structural steel will still

be needed for many military purposes, such as building battleships, replacing small with large bridges capable of carrying large military tanks. More structurals will be needed for military headquarters, officers' buildings, permanent barracks, and similar buildings.

Sales of fabricated structural steel for consumption in the United States during the first 10½ months this year have been 1,221,448 tons as against 1,163,521 tons for all of 1939. These figures are derived from weekly reports in STEEL, list-

ing only jobs 100 tons or more each. Moreover sales for use in Canada, the Canal Zone, Hawaii, or for other export are not included in these figures.

The navy has been an important buyer of steel this year, for battleships, navy bases and air fields. Thus the small state of Rhode Island stood eighteenth among the states as a structural steel user in both 1940 and 1939, largely because of the large naval air base at Quonset Point. Naval and aircraft activities have been important in keeping California in second place for two years. Buying of structurals for use at Newport News, shipbuilding center, placed Virginia in tenth place in 1940 as against sixteenth in 1939.

For less obvious reasons, Ken-

### Structural Shape Awards by States

	1940*		1939			1940*		1939	
	Net Tons	Per Cent	Net Tons	Per Cent		Net Tons	Per Cent	Net Tons	Per Cent
New York	258,047	21.35	227,805	19.58	West Virginia	8,215	0.66	5,635	0.48
California	157,891	13.06	108,119	9.29	Minnesota	7,800	0.62	9,429	0.81
Pennsylvania	77,872	6.43	62,626	5.38	Utah	7,405	0.59	3,090	0.27
Illinois	62,748	5.17	86,149	7.40	Kansas	6,929	0.55	5,927	0.51
Washington	61,477	5.09	53,143	4.57	Montana	5,500	0.43	8,417	0.72
Ohio	60,860	5.01	70,298	6.09	Georgia	4,430	0.33	1,450	0.12
Texas	45,998	3.79	32,755	2.81	Mississippi	4,100	0.32	24,685	2.12
Michigan	42,750	3.52	22,700	1.95	New Mexico	3,833	0.29	685	0.06
Connecticut	37,330	3.07	22,133	1.90	Maine	3,500	0.26	1,842	0.16
Virginia	35,290	2.90	17,720	1.52	Iowa	3,294	0.24	12,585	1.08
New Jersey	34,580	2.84	56,134	4.82	Nevada	3,050	0.23	360	0.03
Massachusetts	32,022	2.62	24,010	2.06	North Carolina	2,910	0.22	7,210	0.62
Indiana	30,141	2.48	19,115	1.64	Nebraska	2,606	0.21	7,980	0.68
Maryland	27,280	2.24	47,855	4.11	Wyoming	2,592	0.20	2,872	0.25
Florida	22,543	1.85	15,225	1.31	Louisiana	2,508	0.19	16,160	1.39
Colorado	20,361	1.66	10,183	0.88	Vermont	2,290	0.17	5,904	0.51
Missouri	19,351	1.57	11,070	0.95	Arizona	2,197	0.16	13,917	1.20
Rhode Island	17,690	1.43	16,185	1.39	South Carolina	2,015	0.15	7,365	0.63
Dist. of Col.	14,180	1.16	17,265	1.48	New Hampshire	1,915	0.13	8,640	0.74
Tennessee	13,987	1.14	13,533	1.16	South Dakota	1,665	0.11	915	0.08
Oklahoma	12,407	1.01	8,450	0.73	Arkansas	1,267	0.07	2,150	0.18
Delaware	12,070	0.96	7,835	0.67	North Dakota	900	0.05	1,040	0.09
Alabama	11,580	0.93	5,050	0.43	Idaho	709	0.04	875	0.07
Oregon	11,527	0.92	13,587	1.17	Total	1,221,448	100.00	1,163,521	100.00
Wisconsin	11,062	0.88	14,998	1.29					
Kentucky	8,774	0.70	30,445	2.62					

\*Through Nov. 11.

tucky slipped from tenth place in 1939 to twenty-sixth place in 1940; Mississippi changed from eleventh position in 1939 to thirty-third this year. Louisiana has been demoted from nineteenth to forty-first place in the past year.

Washington stood fifth this year because of navy and air corps construction and the Coulee dam work. Ohio is in sixth position because of its prominence as an industrial center. Texas stands seventh, partly because of prominence as an air training region.

For the year to date, New York city has taken 164,765 tons, or 13½ per cent of the nation's total, compared with 140,076 tons, or 12 per cent in all of 1939. At one time New York city was credited with 25 per cent, particularly during the skyscraper building era.

Chicago used only 25,230 tons, or 2 per cent in 1940 as against 42,892 tons, or 3½ per cent the year before.

## Vichy Government Bans Steel, Coal Trusts

■ The Vichy government has dissolved both coal and steel trusts in France, as well as labor unions because, according to Marshal Petain, "international capitalism and international socialism have exploited and degraded French labor." Organizations abolished have been the Comité des Forges, Central Coal Committee and the Confederation Generale du Patronat among the employers, and the Confederation Generale du Travail, France's principal labor union.

The steel committee has long been recognized as the most powerful industrial coalition in France. The labor confederation has been charged with entering into politics, sometimes giving orders to the government.

## Defense Contracts

(Concluded from Page 31)

Watervliet, N. Y., castings, \$4310.25.  
 American Brass Co., Waterbury, Conn., small arms ammunition, \$90,824.50.  
 American Foundry Equipment Co., Mishawaka, Ind., blasting units, \$3688.  
 American Rolling Mill Co., Middletown, O., strip steel, \$2565.20.  
 Atlas-Ansonia Co., New Haven, Conn., ammunition components, \$484,000.  
 Barber Colman Co., Rockford, Ill., grinding machines, \$3556.  
 Bethlehem Steel Co., Bethlehem, Pa., artillery ammunition, \$7800.  
 Bridgeport Brass Co., Bridgeport, Conn., artillery ammunition, \$948,240.  
 Central Steel & Wire Co. and Griffin Mfg. Co., Erie, Pa., strip steel, \$27,989.80.  
 Cincinnati Ball Crank Co., Oakley, Cincinnati, portable grease compressors, \$2352.90.  
 Cincinnati Milling Machine & Cincinnati Grinders Inc., Oakley, Cincinnati, broaching machines, \$23,250.  
 Cleveland Universal Jig Co., Cleveland, machinery, \$1646.51.

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., bolt assemblies, \$1837.50.  
 Diebold Safe & Lock Co., Canton, O., armor plate, \$1083.  
 Disston, Henry, & Sons, Tacony, Philadelphia, armor plate, \$2378.75.  
 Economy Fuse & Mfg. Co., Chicago, artillery ammunition, \$547,950.  
 Electric Wheel Co., Quincy, Ill., trailers, \$2575.25.  
 Elwood Ordnance Plant, Elwood, Ind., loading artillery ammunition, \$5,482,331.94.  
 Emels Electrical Service Co., Davenport, Iowa, automotive equipment, \$8649.60.  
 Ever-Tite Mfg. Co., Davenport, Iowa, guards, angles, mud guards, etc., \$18,934.  
 EX-Cell-O Corp., Detroit, center lapping machines, \$1335.60.  
 Fairchild Aviation Corp., Jamaica, N. Y., parts for observation instruments, fire control equipment, \$291,591.03.  
 Hampden Brass Co., Springfield, Mass., bronze castings, \$5769.55.  
 Harnischfeger Corp., Milwaukee, excavator and crane, \$8473.  
 Hayes, C. I., Inc., Providence, R. I., annealing furnace, \$4350.  
 Iowa Ordnance Plant, Burlington, Iowa, loading artillery ammunition, \$8,207,488.20.  
 Johnson, J. F., & Co., Philadelphia, gages, \$1140.  
 Klingston Products Corp., Kokomo, Ind., artillery ammunition, \$508,000.  
 Mergenthaler Linotype Co., Brooklyn, N. Y., fire control equipment, \$609,885.84.  
 Mobilift Co. of New York Inc., New York, trucks, \$3085.86.  
 Morgan Machine Co. Inc., Rochester, N. Y., machinery, \$4094.80.  
 Moskowitz, Edward, Inc., Brooklyn, fire control equipment, \$16,632.  
 Murray Mfg. Co., Brooklyn, N. Y., artillery ammunition, \$1,195,000.  
 National Tube Co., McKeesport, Pa., forgings, \$1,152,400.  
 Nelson, Herman, Co., Moline, Ill., automotive equipment, \$1636.  
 Niles-Bement-Pond Co., Pratt & Whitney division, West Hartford, Conn., machinery, \$75,058.  
 Norma-Hoffmann Bearings Corp., Stamford, Conn., ball bearings, \$1652.55.  
 Oliver Machinery Co., Grand Rapids, Mich., lathes, \$3697.70.  
 Peco Mfg. Co., Philadelphia, ammunition components, \$1,005,280.  
 Pittsburgh Stencil & Tool Co., Pittsburgh, steel stamps, \$1481.42.  
 Quality Hardware & Machine Corp., Chicago, motor drives, \$19,887.  
 Ravenna Ordnance Plant, Ravenna, O., loading artillery ammunition, \$6,609,640.  
 Revere Copper & Brass Inc., Baltimore, small arms ammunition, \$125,199.  
 Scovill Mfg. Co., Waterbury, Conn., small arms ammunition, \$69,000.  
 Stevens, Charles N., Co., Dayton, O., cloth cutting machine, \$5890.  
 Steward, Charles C., Machine Co., Birmingham, Ala., ammunition components, \$2041.  
 Stewart-Warner Alemitte Corp., Chicago, artillery materiel, \$5328.  
 Stockham Pipe Fittings Co., Birmingham, Ala., artillery ammunition, \$571,200.  
 Texasteel Mfg. Co., Ft. Worth, Tex., artillery ammunition, \$1,195,000.  
 Timken-Detroit Axle Co., Wisconsin Axle division, Oshkosh, Wis., automotive parts, \$33,611.60.  
 Uchtorff Co., Davenport, Iowa, automotive equipment, \$2396.75.  
 Ulmer, J. C., Co., Cleveland, gages, \$1033.  
 Wallace Supplies Mfg. Co., Chicago, manifold exhaust assemblies, \$21,830.75.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., machines, \$7000.  
 Weatherhead Co., Cleveland, artillery ammunition, \$1,032,000.  
 Western Cartridge Co., East Alton, Ill., small arms ammunition, \$2,150,000.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., ammunition components, \$944,000.

### Signal Corps Awards

Federal Telegraph Co., Newark, N. J., components for radio sets, \$1,336,030.11.

### Air Corps Awards

Aluminum Co. of America, Pittsburgh, aluminum and alloy steel sheets, \$84,332.12.  
 Bendix Aviation Corp., Pioneer Instrument division., Bendix, N. J., indicator assemblies, \$308,000.  
 Curtiss-Wright Corp., Curtiss Propeller division, Clifton, N. J., blade assemblies, \$97,110.  
 Snap-On Tools Corp., Kenosha, Wis., tools, \$39,314.60.  
 Square D Co., Kollsman Instrument division, Elmhurst, N. Y., indicator and tube assemblies, tachometers, \$1,409,323.75.  
 Victor Equipment Co., San Francisco, welding kits, \$18,745.

### Quartermasters Corps Awards

Ahlberg, O., & Sons Inc., Cranston, R. I., temporary housing, Forts Gettys, Adams, Kearney and Wetherill (harbor defenses of Narragansett Bay), R. I., \$720,000.  
 Cyclone Fence Co., Ft. Worth, Tex., fencing, Hatbox field, Okla., \$4474.  
 Dickmann, Joseph A., Muskogee, Okla., radio transmitter and beacon range buildings, Hatbox field, Okla., \$7800.  
 Doyle & Russell Co., and Wise Contracting Co., Richmond, Va., construction of replacement center, Camp Lee, Va., \$7,539,051.  
 Eastern Construction Co., New Haven, Conn., temporary housing, Ft. H. G. Wright, N. Y., \$183,000.  
 Harris-Harmon Well Co. Inc., Mineota, N. Y., well and equipment, Ft. Hancock, N. J., \$6952.50.  
 Hoffman, George, & Sons Inc., New York, temporary housing, Ft. Jay, N. Y., \$329,939.  
 Kler, W. E., Construction Co., San Diego, Calif., construction of replacement center, San Diego, \$2,199,492.  
 Lagreid, Olaf, Honolulu, T. H., buildings, Schofield barracks, T. H., \$3356.  
 Meade & Mount Construction Co., Denver, construction of replacement center, Ft. F. E. Warren, Wyo., \$1,970,720.  
 Merando Co., Washington, mess hall, Bolling field, District of Columbia, \$52,483.  
 Newton, A. K., Bugbee & Co., Trenton, N. J., sewage disposal plant, Raritan arsenal, N. J., \$26,816.  
 Pittsburgh-Des Moines Steel Co., Des Moines, Iowa, elevated steel tank and accessories, Ft. Sill, Okla., \$40,500.  
 Ritchie, Walter L., Sommerville, Mass., temporary housing, Ft. Ruckman, Mass., \$24,896.  
 Slotnik, J., Boston, temporary construction, harbor defenses, Portsmouth, N. H., \$519,294.  
 Sound Construction & Engineering Co., Seattle, and Peter Kiewit Sons' Co., Omaha, Neb., buildings and concrete reservoirs, Port Lewis, Wash., \$3,075,000.  
 Spinello Construction Co., Newark, N. J., extensions to water and sewer systems, Ft. Hancock, N. J., \$67,406.67.  
 Stendell, Elvin C., San Francisco, buildings, Moffett field, Calif., \$10,450.  
 Sullivan-Foster Inc., New Bedford, Mass., temporary housing, Ft. Rodman, Mass., \$289,898.  
 Twatts, Ford W., Co., Los Angeles, and Morrison-Knudsen Co. Inc., Boise, Idaho, construction of replacement center, Camp Nacimiento, Calif., \$6,018,733.  
 Walsh Bros., Cambridge, Mass., tem-

porary housing, Ft. Strong, Mass., \$85,000.

Walbridge, Aldinger Co., Detroit, temporary construction, Selfridge field, Mich., \$666,000.

Navy department announced the following awards:

Baton, Henry E., Inc., Philadelphia, receiving barracks and accessories at Philadelphia navy yard, \$450,000.

Bundesen & Lauritzen, Pittsburg, Calif., outfall sewer for 600 housing units near Vallejo, Calif., \$38,750.

Henger Construction Co., Dallas, Tex., aviation facilities, naval reserve aviation base, Dallas, \$750,000.

National Heating Co., Washington, extension to steam main at research laboratory, Washington, \$13,980.

Puget Sound Bridge & Dredging Co., and Rumsey & Co., Seattle, construction of pier No. 3 at navy yard, Puget Sound, Washington, \$2,000,000.

Severin Electric Co., San Francisco, power wiring at navy yard, Pearl Harbor, T. H., \$66,900.

Telchert, A., & Son Inc., Sacramento, Calif., outfall sewer for 600 housing units, near Vallejo, Calif., \$29,800.

Bureau of Supplies and Accounts Awards

American Steel & Wire Co., Cleveland, heat and flame-resistant cable, \$7840.80.  
Bamberger Reinthal Co., Cleveland, watch caps, \$61,950.

Bowen Products Corp., Auburn, N. Y., fuse covers and soldering strips, \$20,781.60.

Camillus Cutlery Co., New York, jackknives, \$24,068.

Chase Brass & Copper Co. Inc., Waterbury, Conn., condenser tubes, \$50,986.43.

Chicago Pneumatic Tool Co., Philadelphia, pneumatic drills and grinders, \$29,663.30.

Cincinnati Shaper Co., Cincinnati, squar-

ing machines, press brake machines, \$37,562.

Consolidated Aircraft Corp., San Diego, Calif., airplanes, \$18,529,500.

Curtiss-Wright Corp., Curtiss Aeroplane division, Buffalo, airplanes, \$29,139,793.20.

Electric Storage Battery Co., Philadelphia, spare parts for submarine batteries, \$11,519.25.

Enterprise Foundry Co., San Francisco, stretcher weights, \$13,800.

Foster Wheeler Corp., New York, brass pipe, \$176,962.63.

Gardner-Denver Co., Quincy, Ill., air compressor, \$5747.

Gisholt Machine Co., Madison, Wis., turret lathes, \$107,397.

Hyde Windlass Co., Bath, Me., electric windlasses, \$58,000.

Independent Pneumatic Tool Co., Chicago, pneumatic drills, hammers, \$5057.20.

Ingersoll-Rand Co., New York, pneumatic drills, grinders, hammers, \$51,637.04.

Kearney & Trecker Corp., Milwaukee, milling machines, \$326,373.60.

Keystone Mfg. Co., Buffalo, steel sockets, \$6684.26.

McQuay Inc., Minneapolis, heaters and radiators, \$6516.88.

Midway Electric Supply Co. Inc., New York, conduit pipe, \$114,189.50.

Millers Falls Co., Greenfield, Mass., ratchet braces, \$5620.40.

Mine Safety Appliances Co., Pittsburgh, telephone head harness, \$16,200.

Montgomery & Co. Inc., New York, hand drills, \$12,204.

Mosler Safe Co., Hamilton, O., burglar resisting safes, \$14,415.

National Electric Products Corp., Pittsburgh, electric cable, \$11,409.50.

Naudain Mfg. Co., Baltimore, billet heating furnace for forging purposes, \$5790.

Niagara Machine & Tool Works, Buffalo, squaring machines, \$7828.

Peck Stow & Wilcox Co., Southington, Conn., ratchet braces, \$15,134.85.

Sellers, Wm., & Co. Inc., Philadelphia,

horizontal boring, drilling and milling machine, \$16,845.

Sperry Gyroscope Co. Inc., Brooklyn, N. Y., automatic pilots, signal units, transfer valves, gyrocompass equipment, \$3,137,717.30.

Standard Transformer Co., Warren, O., transformers, \$24,113.

Steel Improvement & Forge Co., Cleveland, steel forgings, \$47,032.50.

Stone Heating & Ventilating Co., Washington, electric fans, \$34,378.

Swind Machinery Co., Philadelphia, squaring machines, \$62,673.

Tabor Mfg. Co., Philadelphia, cut-off machine, \$5400.

Taylor-Parker Co. Inc., Norfolk, Va., hand drills, \$24,263.20.

United Aircraft Corp., Pratt & Whitney Aircraft division, East Hartford, Conn., airplane engines, \$57,856,179.45.

Verson Allsteel Press Co., Chicago, press brake machines, \$7472.

Vulcan Crucible Steel Co., Allquippa, Pa., tool steel, \$8365.

Watson-Stillman Co., Roselle, N. J., pipe bending machines, \$11,775.

Yale & Towne Mfg. Co., Automatic Transportation Co. division, Chicago, low lift electric trucks, \$5641.60.

Zimmer Splint Co., New York, aluminum litters, \$12,960.

Bureau of Yards and Docks Awards

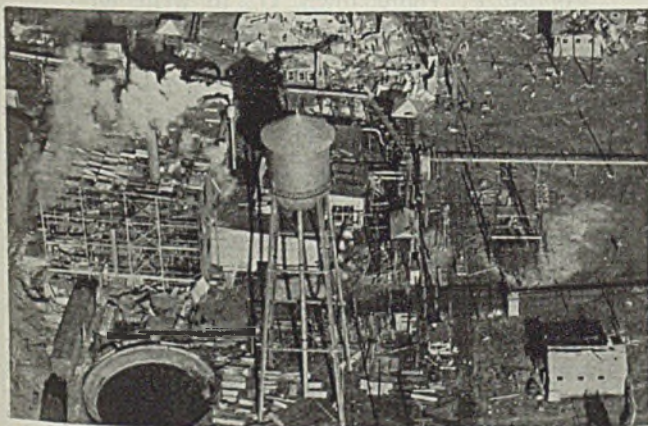
Day & Zimmerman Inc., Philadelphia, warehouse and accessories at marine corps depot of supplies, Philadelphia, \$1,170,000.

Miller Stauch Construction Co., Kansas City, Mo., students' barracks building at naval reserve aviation base, Kansas City, Kans., \$98,000.

Wadhams, May & Carey Co., Hartford, Conn., housing facilities at submarine base, New London, Conn., \$277,000.

White Construction Co., New York, receiving barracks and accessories at navy yard, Brooklyn, N. Y., \$1,300,000.

## Is This the Work of Saboteurs?



■ Strict precautions against sabotage in plants manufacturing national defense materials are being taken as result of a series of recent explosions. While little evidence of sabotage has been admitted by investigators, many observers believe the frequency of such blasts strongly supports the willful damage theory. Pictured are ruins at the Kenvil, N. J., plant of the Hercules Powder Co., wrecked by a mysterious explosion Sept. 12, and plant of the United Railway Signal Corp., Woodbridge, N. J., destroyed Nov. 12

## Industry and the Newspapers

■ WHILE STEEL does not know all the facts that led to the strike at the plant of the Vultee Aircraft division of Aviation Mfg. Corp., Downey, Calif., it does believe that the Vultee officials should be complimented for intelligently handling an embarrassing situation.

Newspapers on Sunday, Nov. 17, devoted considerable space to the statement of L. H. Michener, West Coast director of the striking CIO-UAW union, that "the only issue in this dispute is whether trained men, most of them family men, shall continue to work for \$19 or \$20 a week . . . With millions of dollars of revenue already assured, the management can well afford it. From its \$80,000,000 backlog the company will make a net profit of \$12,000,000 in the next three years. For all of its 'patriotism' the management has not offered to build these planes without profit."

Instead of feeling, as so many managements have felt in quite similar situations in the past, that this accusation should be disregarded, the Vultee officials issued a statement which occupied considerable space in the newspapers of Monday morning.

"Contrary to propaganda spread by union leaders, Vultee is not making millions of dollars out of national defense contracts," the statement read. "It is a matter of public record and long known to those who ordered the strike that Vultee has paid no dividends. The company showed a net loss for the year ending Nov. 30, 1939, of over \$840,000. During the first nine months of 1940 the company recorded another net loss of \$58,000 . . . Vultee wages are equal to or better than

most and the average labor rate at the plant closed by the strike is over 68 cents an hour. The principal point of contention involves the question of wage rates affecting only 13 per cent of Vultee's employees. These employees are beginners, without previous plant experience. They are nearly all very young men. The company has spent considerable sums of money to train them. The wage rate for these beginners is 50 cents an hour. Union propaganda has implied that trained men are working at Vultee for \$19 or \$20 a week. That is not true."

In thus defending its own position as an employer, Vultee rendered a service to industry in general by making it clear that the emotional appeals of labor leaders are not always to be trusted.

STEEL recently invited George R. Reiss, of the editorial staff of *The Youngstown Vindicator*, Youngstown, O., to write an article on "Industrial Relations as Seen by a Newspaperman." It appears in this issue, starting on page 21. It is "must" reading for every employer.

Mr. Reiss makes it clear that the newspapers want to print the facts, without fear or favor, and that when they err it is because they have been unable to get all the facts. He makes it clear that when an employer or an industry has a "bad" press it must be due either to policies that do not withstand public scrutiny, or to a failure to understand the importance of dealing properly with newspapermen.

*EC Kreutzberg*

# The BUSINESS TREND

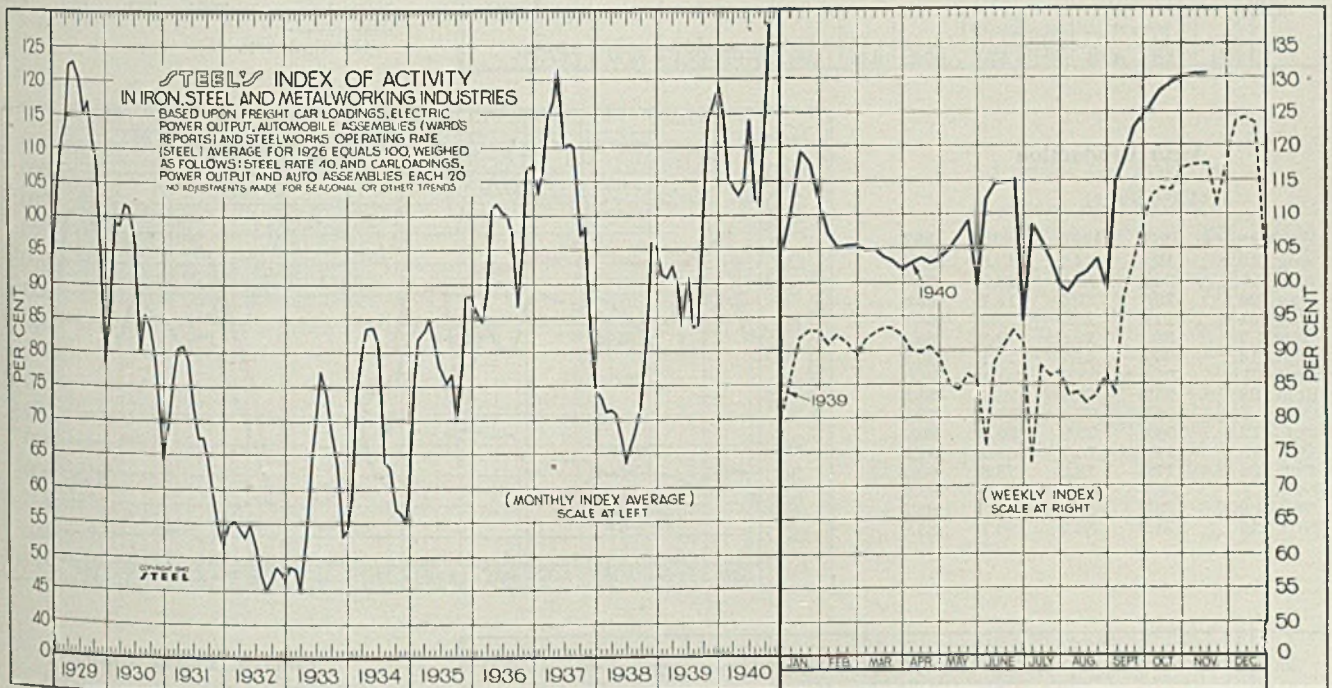


## Industrial Activity Well Sustained at Peak Level

NEW demand in the capital goods industries is well sustained despite record bookings over the past few months. This is particularly true in such industries as steel, machine tool, aircraft and private building construction. In certain instances order backlogs have accumulated to such proportions as to assure a high level of operations throughout at least the first half of next year. Some companies in the machine tool industry cannot promise deliveries on certain types of machine tools until early 1942.

Indicative of the sharp upturn in industrial ac-

tivity during recent months, October machine tool production attained a new high level, more than double the October, 1939 output. The industry's productive capacity, already up 50 per cent in a year, is still expanding. Shipments of machine tools in October were at an estimated annual rate of over \$460,000,000. Foundry equipment sales reached the highest level this year during October. Automobile retail sales and production recorded the best October volume in history. Steel ingot production and pig iron output also attained new peaks last month.



STEEL'S index of activity held unchanged at 130.3 in the week ended Nov. 16.

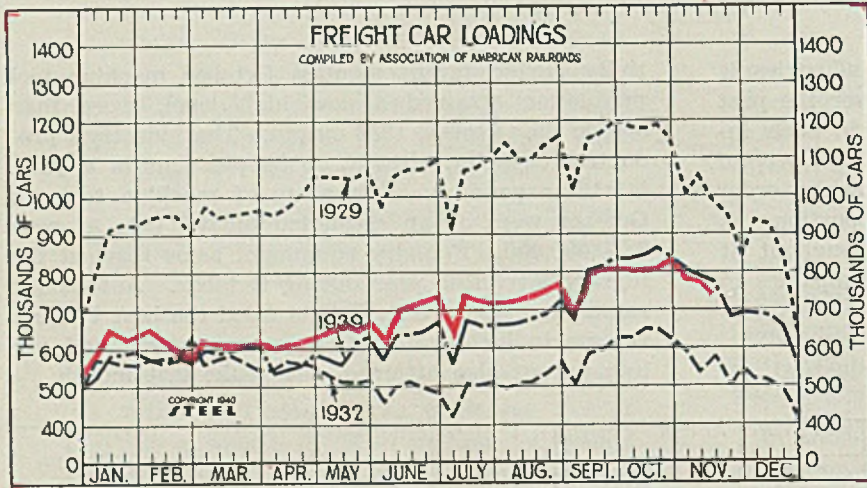
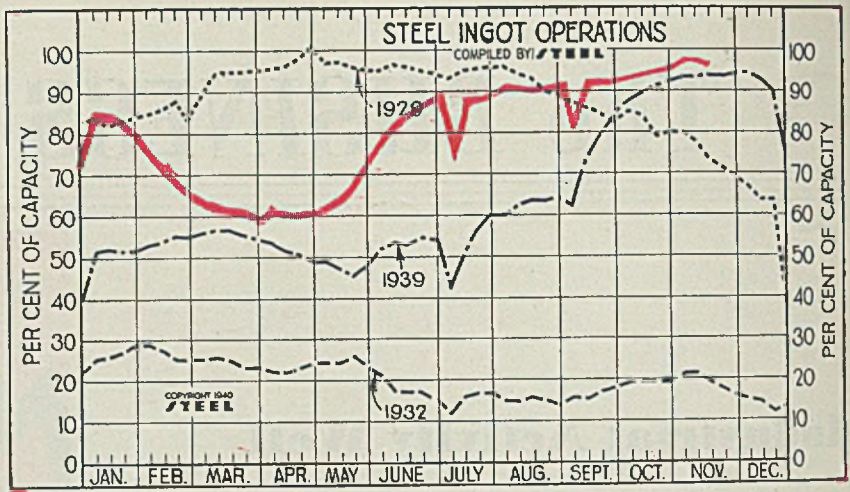
Week Ended	1940	1939	Mo. Data	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Sept. 7	98.7	83.7	Jan.	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Sept. 14	114.9	97.5	Feb.	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
Sept. 21	117.7	103.0	March	104.1	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
Sept. 28	122.8	107.9	April	102.7	89.8	70.8	116.6	100.6	85.0	83.6	52.4	52.8	81.0	101.7	122.5
Oct. 5	124.4	112.5	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. 12	126.0	113.9	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
Oct. 19	128.3	113.6	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
Oct. 26	129.9	116.2	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. 2	130.2	117.1	Sept.	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Nov. 9	130.3	117.2	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. 16	130.3†	117.3	Nov.	.....	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
			Dec.	.....	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

†Preliminary.

### Steel Ingot Operations

(Per Cent)

Week ended	1940	1939	1938	1937
Aug. 10....	90.5	62.0	40.0	84.0
Aug. 17....	90.0	63.5	41.5	81.0
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



### Freight Car Loadings

(1000 Cars)

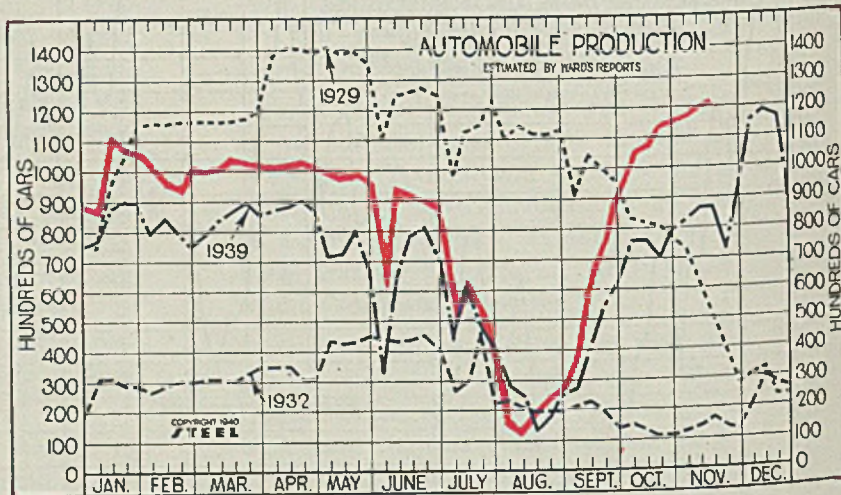
Week ended	1940	1939	1938	1937
Aug. 10.....	727	665	590	777
Aug. 17.....	743	674	598	781
Aug. 24.....	761	688	621	787
Aug. 31.....	769	722	648	805
Sept. 7.....	695	667	569	711
Sept. 14.....	804	806	660	837
Sept. 21.....	813	815	676	840
Sept. 28.....	822	835	698	847
Oct. 5.....	806	835	703	815
Oct. 12.....	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.....	755†	771	657	647

†Preliminary.

### Auto Production

(1000 Units)

Week ended	1940	1939	1938	1937
Aug. 10....	12.6	24.9	13.8	103.3
Aug. 17....	20.5	13.0	23.9	93.3
Aug. 24....	23.7	17.5	18.7	83.3
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

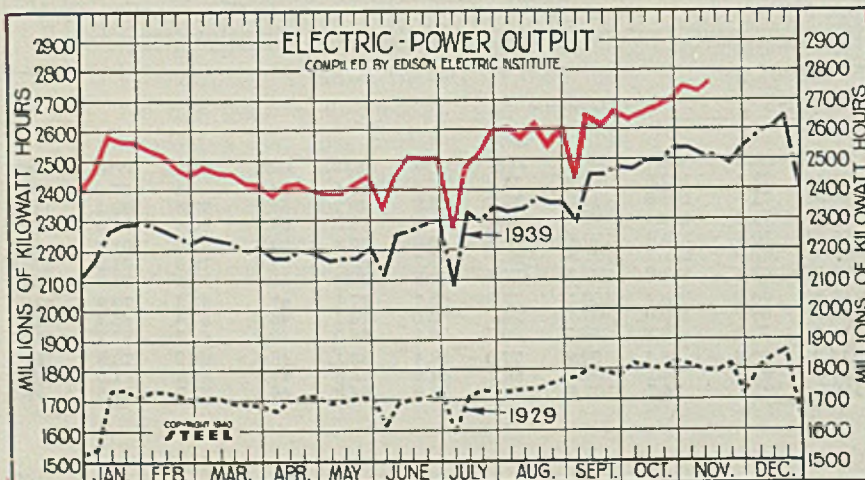


### Electric Power Output

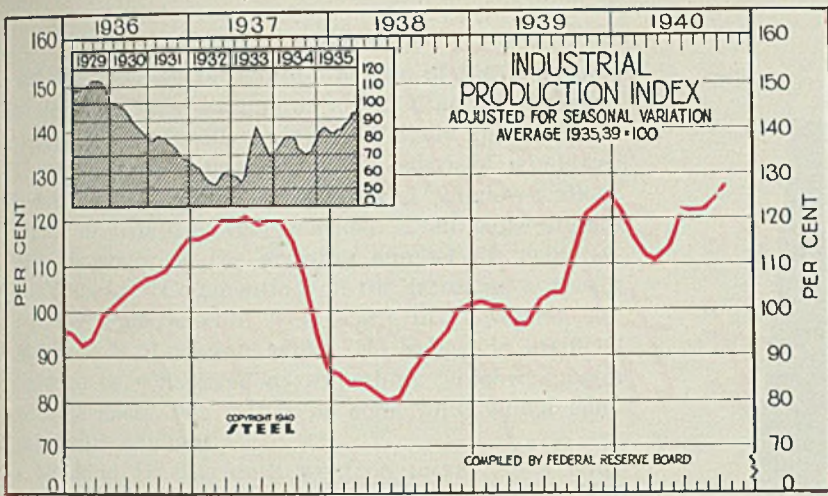
(Million KWH)

Week ended	1940	1939	1938	1937
Aug. 10...	2,589	2,333	2,134	2,301
Aug. 17...	2,606	2,368	2,139	2,304
Aug. 24...	2,571	2,354	2,134	2,286
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	2,282
Oct. 26...	2,711	2,539	2,226	2,285
Nov. 2...	2,734	2,537	2,207	2,202
Nov. 9...	2,720	2,514	2,209	2,176
Nov. 16...	2,740†	2,514	2,270	2,224

†Preliminary.







**Industrial Production**  
Federal Reserve Board's Index

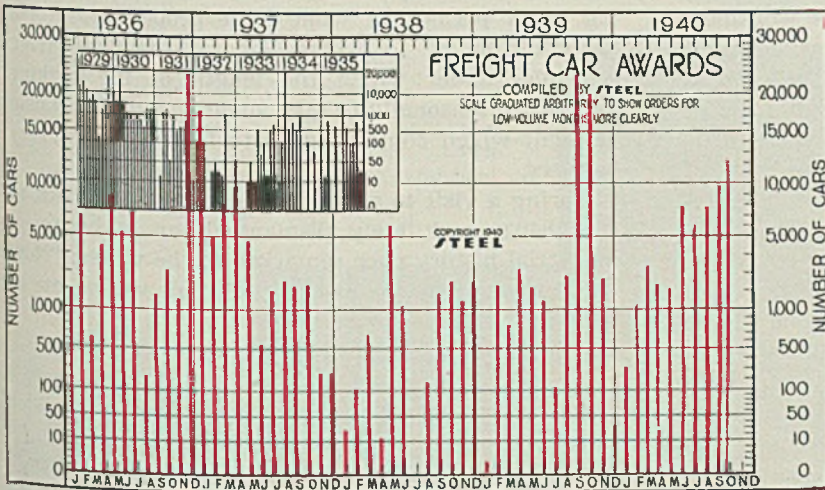
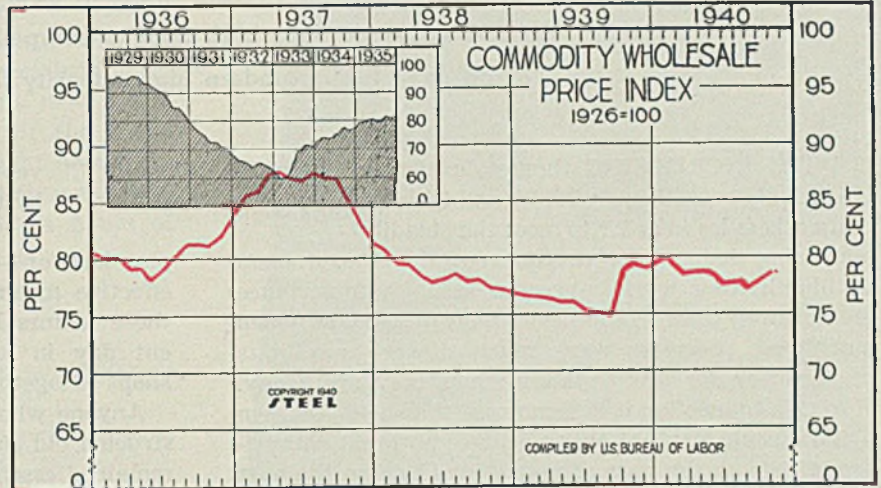
(1935-39 = 100)

	1940	1939	1938	1937	1936
Jan. ....	122	102	86	116	95
Feb. ....	116	101	84	113	92
March ....	112	101	84	120	94
April ....	111	97	82	120	99
May ....	115	97	80	121	101
June ....	121	102	81	119	103
July ....	121	104	86	120	105
Aug. ....	121	104	90	120	107
Sept. ....	125	113	92	115	108
Oct. ....	128	121	95	107	109
Nov. ....	...	124	100	95	113
Dec. ....	...	126	101	87	116

**All Commodity Wholesale Price Index**  
U. S. Bureau of Labor

(1926 = 100)

	1940	1939	1938	1937	1936
Jan. ....	79.4	76.9	80.9	85.9	80.6
Feb. ....	78.7	76.9	79.8	86.3	80.6
March ....	78.4	76.7	79.7	87.8	79.6
April ....	78.6	76.2	78.7	88.0	79.7
May ....	78.4	76.2	78.1	87.4	78.6
June ....	77.5	75.6	78.3	87.2	79.2
July ....	77.7	75.4	78.8	87.9	80.5
Aug. ....	77.4	75.0	78.1	87.5	81.6
Sept. ....	78.0	79.1	78.3	87.4	81.6
Oct. ....	78.4	79.4	77.6	85.4	81.5
Nov. ....	...	79.2	77.5	83.3	82.4
Dec. ....	...	79.2	77.0	81.7	84.2
Ave. ....	...	77.1	78.6	86.3	80.8



**Freight Car Awards**

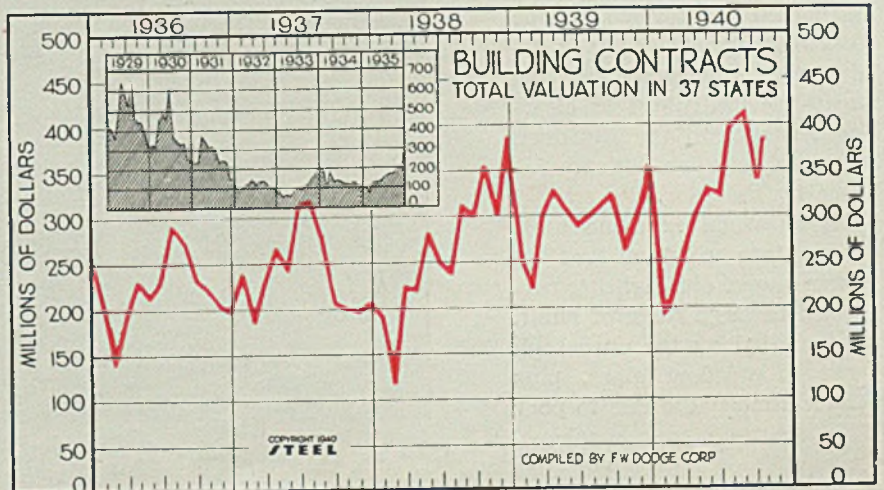
(Hundreds of Cars)

	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
April ....	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. ....	...	26.50	12.32	2.75
Dec. ....	...	.35	25.81	2.75
Total .....	577.75	163.03	516.11	

**Construction Total Valuation**  
In 37 States

(Unit: \$1,000,000)

	1940	1939	1938	1937	1936
Jan. ....	\$196.2	\$251.7	\$192.2	\$242.7	\$204.8
Feb. ....	200.6	220.2	118.9	188.3	142.1
Mar. ....	272.2	300.7	226.6	231.2	199.0
April ....	300.5	330.0	222.0	269.5	234.8
May ....	328.9	308.5	283.2	243.7	216.1
June ....	324.7	288.3	251.0	317.7	232.7
July ....	398.7	299.9	239.8	321.6	294.7
Aug. ....	414.9	312.3	313.1	281.2	275.3
Sept. ....	347.7	323.2	300.9	207.1	234.3
Oct. ....	383.1	261.8	357.7	202.1	225.8
Nov. ....	...	299.8	301.7	198.4	208.2
Dec. ....	...	354.1	389.4	209.5	199.7
Ave. ....	...	\$295.9	\$266.4	\$242.8	\$222.3



# "Give Them Light that they may see"

When vital industries must operate two and three shifts to meet national defense demands, it is high time to scrap the "dark shop tradition" and adopt modern high intensity illumination

■ WITH INCREASING thousands of machine tools operating on 16, 20 and 24-hour daily schedules in order to meet the steadily increasing demand for defense materiel, the problem of illuminating work-in-process assumes importance greater even than in the hectic days of 1917-18, when machining processes were much slower and limits of accuracy far less exacting, than they are today.

In this connection it is significant that now—as then—the advent of night shifts arouses no great enthusiasm either on the part of management or on the part of the better class of workmen. This is no reflection on the patriotism either of management or workmen. Management always has good reason to consider night shifts as unduly wasteful, both because of their record of low gross output and because of a high ratio of spoiled work and injuries to men and machines. Craftsmen likewise are inclined to believe on the basis of past experience, that night work entails undue mental and physical fatigue—fatigue beyond that normally expected to result from "turning night into day."

These attitudes in both cases are due in no small degree to one of the most persistent and one of the most undesirable of all metalworking traditions—that of the "dark shop." This tradition took root back in the dim beginnings of the industry when metal was worked by hand—primarily by the process of hot forging. This, under old fashioned conditions, made dim lighting necessary in order that the color of the heated metal might be clearly apparent to the workmen who had to judge its temperature by its color.

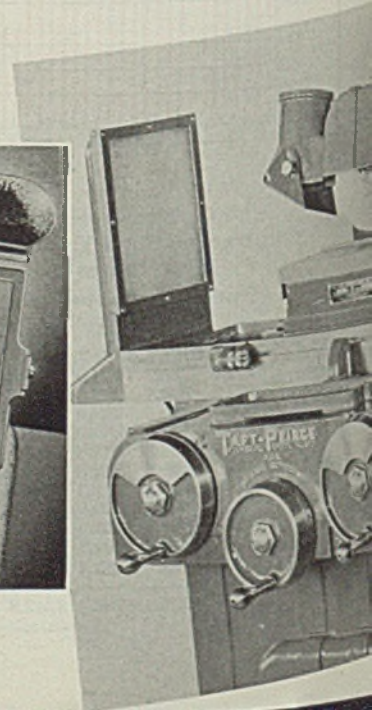
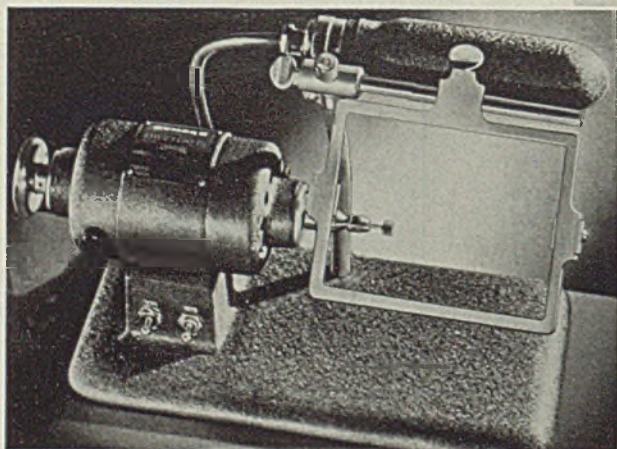
Even when machine tools came into common use in these shops, dim lighting persisted through force of habit, aggravated by the once high cost of window glass, plus thick atmosphere due to poor

By GUY HUBBARD  
Machine Tool Editor

ventilation, plus serious light-interference by the forest of driving belts and the mass of "overhead works" associated with them, plus lack of—or, more recently, failure to provide—effective means for artificial illumination. Some of these factors have persisted right down to the present day in keeping altogether too many machine shops altogether too much "on the dark side."

Anyone who has had experience with an unreconstructed old shop in which illumination facilities have remained essentially as they were in the era of whale oil lamps, can appreciate why it was necessary during boom periods in what some people miscall the "good old days," to evolve elaborate daylight-saving schedules under which the length of the working day varied seasonally to take advantage of all possible daylight which could manage to filter past its many barriers.

During a visit to a famous old shop dating back to the 1840's—and lately dismantled—an authority on industrial history once remarked to the writer: "Now I understand why the machinists' trade was so late in



winning deserved recognition as one of the honorable professions. Just so long as it was practiced in semi-darkness, it naturally enjoyed a 'shady reputation!'" Contrast between heavily walled, sparsely windowed industrial buildings of yesterday, and "window-walled" plants of today, is very marked. Even more significant, however, is the growing number of "window-less" plants. Commenting on the latter at a recent lighting conference at Nela Park in Cleveland, Dr. Matthew M. Luckiesh said: "No longer is artificial light to be considered as something which competes with darkness, but rather as something which competes with daylight."

Mankind, Dr. Luckiesh went on to say, to a large degree has deserted the "world of far-vision" (life in the great open spaces), for a "world of near-vision" (exemplified by exacting industrial work within the confines of four walls). Lighting specialists have not been content merely to make this new world livable. In line with intensive study of the whole science of seeing, these men have brought about improvements in artificial illumination which make possible maximal visibility throughout all 24 hours of the day.

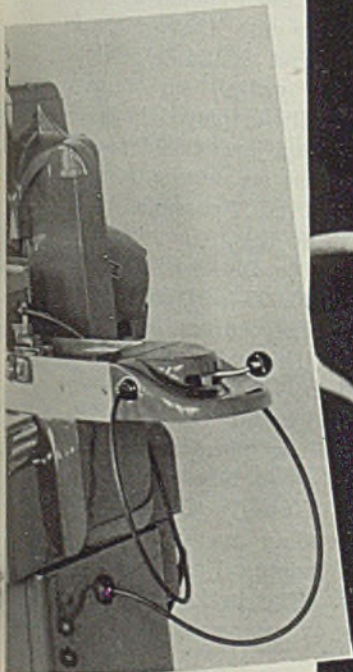
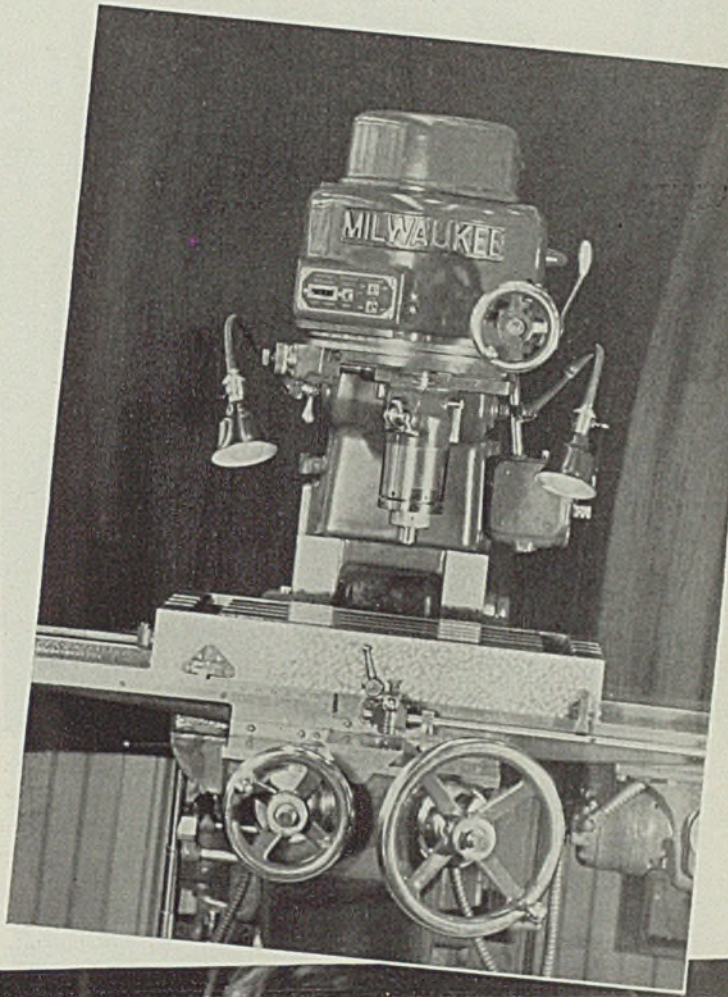
(Please turn to Page 84)

Fig. 1 (Left, below)—Dumore bench grinder unit embodies combined work light and guard

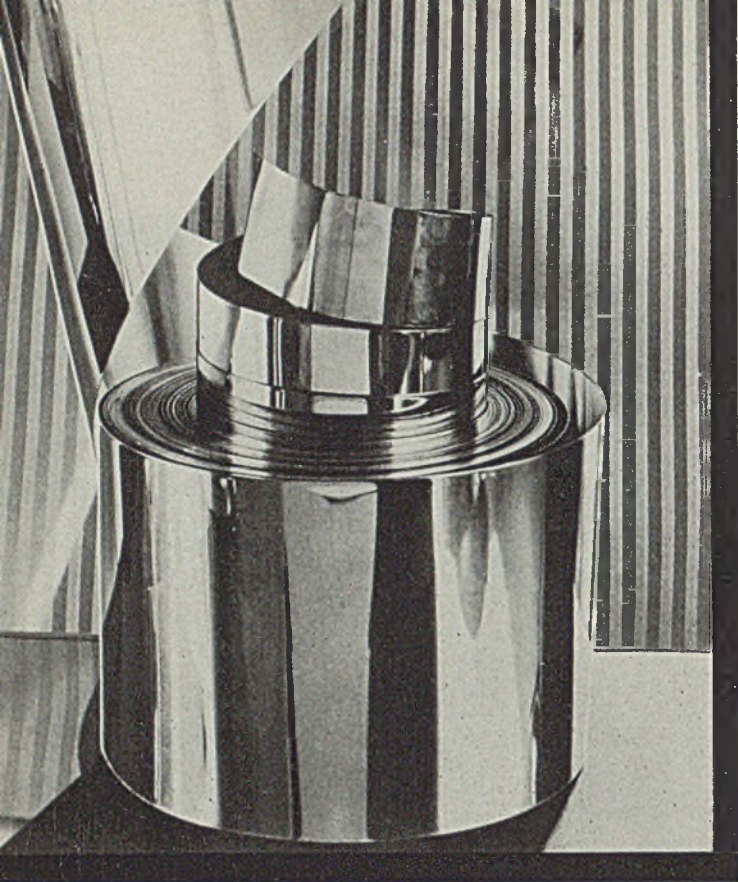
Fig. 2 (Center, below)—Taft-Peirce precision surface grinder has operation and "sighting" light housed behind translucent safety glass panel in guard

Fig. 3 (Right)—Production gaging at Westinghouse Nuttall Works, Pittsburgh, is facilitated by an adjustable lighting fixture mounted on the cylindrical grinder

Fig. 4 (Above)—Kearney & Trecker engineers made provisions for the dual spotlights shown in the basic design of this rotary head tool and die milling machine



*Better Light... Better Sight*



The high luster of prefinished metals as shown here is easily carried through to the finished product if simple precautions are followed

■ *Economic importance of prefinished metals is illustrated by the following typical examples: One company saved approximately 60 per cent in fabricating carpet sweepers by using prefinished metal for the entire case, enabling the company to enter a market otherwise closed to it because of price. Another concern cut its costs 40 per cent by making a corner guard for store counter displays from prefinished metal. Neither of these companies experienced any trouble in drawing or forming the material. These costs are compared to plating after fabrication and do not include the fact that in both instances a higher quality product resulted.*

**D**URING the course of years, users of prefinished metals have discovered a good many ways by which prefinished metals should be fabricated a little bit differently from ordinary base metals.

The fundamental idea which makes for the success of prefinished metals, plated with nickel, chromium, brass or copper, is that such metals require no finishing operations after fabricating. The tedious and expensive work of grinding, buffing, plating and polishing of shaped, fabricated parts is eliminated.

Obviously, large flat surfaces, in either sheets or coils, can be adapted more readily to the principles of mass production finishing than is possible in finishing small shaped parts. Along the same lines, finishing flat surfaces insures an equal treatment in coating and polishing all the area of the surface. Such uniformity is difficult to secure when finish-

## F A B R I C A T I N G

# Pre

By **CARL C. STRUEVER**  
General Manager  
American Nickeloid Co.  
Peru, Ill.

ing formed parts as it is easy to see how getting the same high luster in recesses and corners as on the more readily accessible surfaces is no easy matter.

Remembering then that the ultimate aim in using prefinished metals is to avoid finishing operations after forming, there are a few simple rules that should be observed to secure best results.

It is not possible to set down any hard and fast fabricating rules which will tell exactly how to treat these metals in all cases. Research is continually revealing the answers to new problems of all kinds in connection with the use of these materials.

The fabricator will find zinc base metals more readily workable than most of the commonly known alloy sheets. Such sheets as chromaloid, nickeloid, copperoid and brassoid are pure zinc with a coating as indicated by their name. Nickeloid and chromaloid both have a copper undercoating, also.

The ductility of zinc base metals falls rapidly below 70 degrees Fahr. Frequently, cracking can be avoided by warming both the metal and tools to around 100 degrees Fahr. These metals have a low annealing point and should not be exposed to direct flame or excessive temperatures.

**Bending:** The grain of zinc base metals runs parallel to the length of large sheets and to the length of coils. So for best results, a bend should be made against the grain rather than with the grain. In other words, the edge of the bend should be at right angles to the direction of the grain. An ordinary brake or forming roll is usually employed in bending. The bending and clamping jaw should not be sharp, else the metal may become scratched. A knife edge on a brake should be removed if possible.

Where it is not practical to do this, it is suggested that the upper leaf of the bending brake be set back about  $\frac{1}{4}$ -inch. Then a strip of 0.025-inch, or heavier, galvanized sheet iron may be inserted and bent over the nose of the upper leaf. This will prevent the knife edge of the brake from injuring the highly polished surface of the prefinished metal.

Likewise, it will provide a little more radius since an absolute right angle bend should be avoided as far as possible. For best results, a little radius should be allowed in the bending operation. This radius should necessarily be increased as the thickness of the metal increases. The brake should be clean. Scratching may be overcome by inserting

# Finished METALS

Most prefinished metals have a zinc base, so are readily workable. Since the ultimate aim is to avoid finishing work after forming, fabricating operations should be governed by a few simple rules: Warm metal and tools to 100 degrees Fahr. for stamping or forming. Make bends against grain. Make square corners in two operations, not one. Polish dies in direction of metal flow. Use steel, not zinc, base material if it is to be spot welded

a piece of paper between the upper and lower leaf, or by using a paper covering to protect the polished surface of the metal.

**Seaming:** The instructions given above will also apply when making a lock seam on a bar folder or bench folder. The same methods used to groove other metals may then be applied to complete the lock seam.

Side locked seam is sometimes called a double-locked seam, and generally is used on the bottom of a cylinder. Always use the "thick edge machine" for both body of the cylinder and the bottom. The "burring machine" should not be used since the wheels are too sharp and may have a tendency to cut the metal.

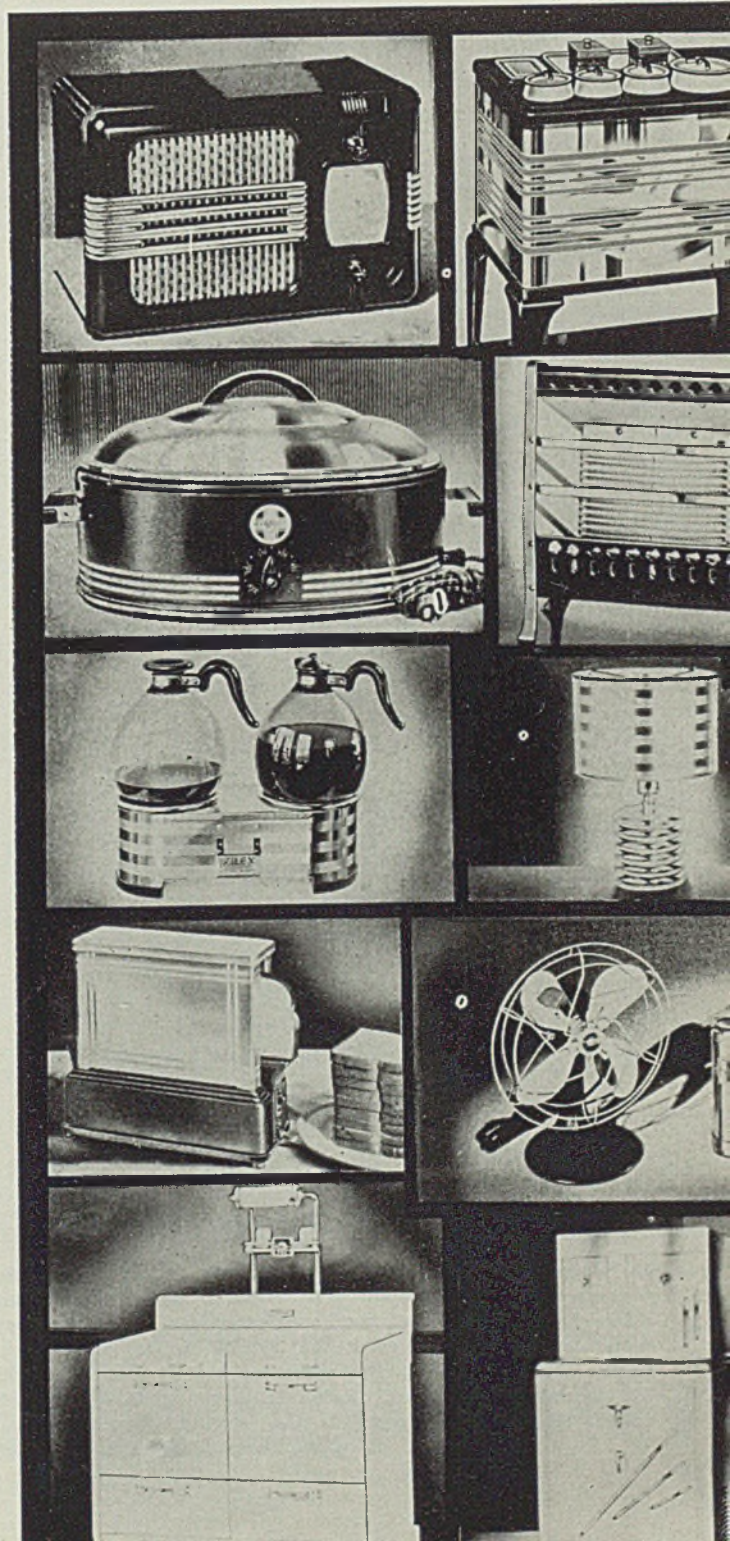
To roll a wired edge, proceed the same as with any sheet metal remembering only to use a radius approximately the same as the radius of the wire used.

For a grooved lock seam, use the same methods as employed for making a lock seam, and groove either by hand or by running through a grooving machine. Other joints and edge reinforcements may be easily made from zinc base metals, keeping in mind these general instructions.

**Soldering:** Zinc base metals are easily soldered. First clean the surface carefully and remove all traces of grease, dirt, and so on. Muriatic acid cut with zinc clippings is a good flux. Half and half solder, free from antimony, should be used with a moderately hot iron while the surface to be soldered is still moist with the flux. A heavy soldering iron is better than a light one as the heat can be kept more uniform and the iron is not so quickly cooled. The iron should not be allowed to become red hot, just hot enough to flow the solder, being careful not to impart any heat to the sheet.

There is no practical method available to us today that will permit soldering directly on a chromium finish. The chromium can be removed easily on the area to be soldered by scraping with a sharp three-cornered tool with cut acid or muriatic acid applied with a swab or brush. The chromium will dissolve in about one minute. Wipe this off, then apply a

Here are a few typical applications of prefinished metals. Note they are particularly suited for trim, moldings, small parts and accessories



paste flux and solder in the usual manner.

**Welding:** Zinc base metals have low melting points, which make spot welding somewhat difficult. If at all possible, other methods than spot welding should be employed. Careful control of amperage and contact time is necessary. Use alloy tips with the lower one mushroom shaped.

**Stamping and Drawing:** It is not practical to give detailed information regarding the stamping and drawing of articles made of zinc base metals since each article presents its own problems. There are, however, certain fundamentals. For instance, all drawing operations should be carried out at temperatures of 70 degrees Fahr. or above. Zinc base metals are self-annealing at room temperatures and hence, no annealing operation is required between draws.

For ordinary small stamped parts, soapy water and oil drawing compounds are satisfactory. If the metal is not oiled, then the cutting edge of the punch and die should be scrubbed with oil occasionally. For large areas, heavy oil or grease prevents friction scratches and excessive dullness. Parts can be dried in a box of sawdust or by

other methods to remove the lubricant and dry the parts. It has also been found that the paper adhered surface on prefinished metals is valuable in preventing handling scratches and it will, in many cases, also be a direct aid in getting better results from severe drawing and forming operations.

The paper adhered surface not only protects the metal from direct contact with the forming tools, but also serves to a certain extent as a cushion. The thickness of the paper used is about 0.0025-inch and the necessary allowance for this thickness should be made in setting up the fabricating machines and tools.

To assure satisfactory results from drawing operations, the dies should be highly polished and free of all dust, dirt, etc. Polishing should be done in the direction of metal flow in the die. When working a highly polished metal such as zinc base metals, it has been found advisable in many instances to chromium plate the dies to reduce surface scratches and die marks to a minimum.

It is to be remembered that where an article to be formed from a zinc base metal can not be successfully drawn in one operation, the addition of another or a third op-

eration will, in many cases, insure success. Zinc base metals will not form square corners in one operation. It is necessary to first make a round corner and then bump out the square corner in a second operation.

**Blanking:** Blanking is essentially shearing, and proper clearances between the punch and the die should be considered. This will vary with the gage being blanked. For light gages, clearances of 0.0005 to 0.001-inch are desirable. For heavier gages, as much as 0.003-inch is not uncommon.

**Temper:** Zinc base metals are available in a number of different tempers. A large range of zinc alloys can be furnished as a base metal. When considering prefinished metals for new applications, considerable judgment must be employed in selecting the alloy which will do what is expected of it.

Brass, copper, tin and steel base metals are worked like zinc base metals in many respects. Their characteristics differ largely by the extent of the difference in the base metals. For instance, zinc is known as a self-healing or self-annealing metal, whereas other metals do not have this characteristic. A considerable number of tests have been performed on prefinished metals with respect to spot welding. It has been found that a steel base metal is the most successful.

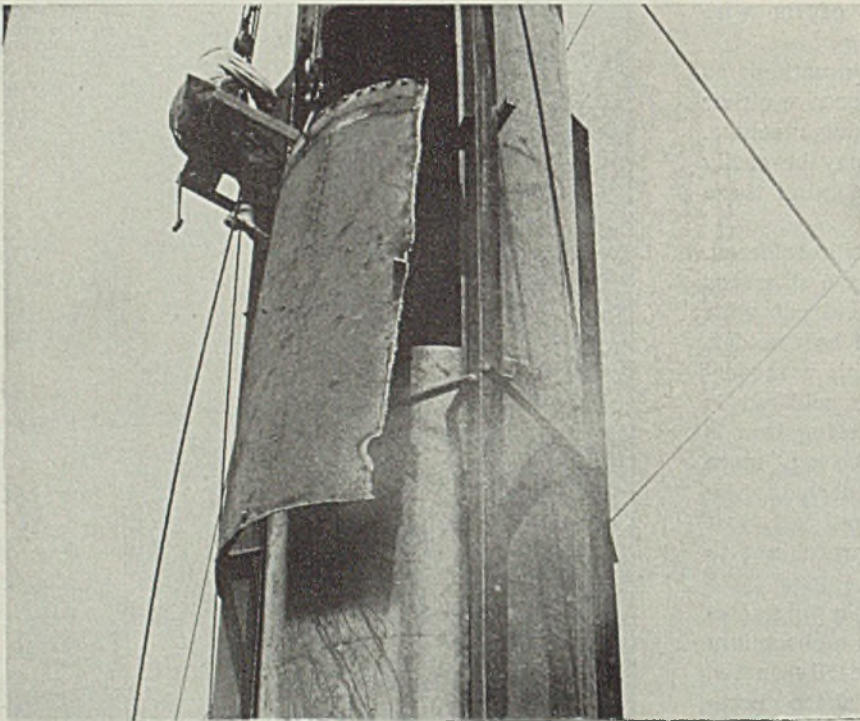
It is, of course, more difficult to spot weld a prefinished metal than an ordinary base metal. First of all, the metals must become hot enough to flow together during welding. Obviously, this heat will dull the polished surface slightly at the point of electrode contact. Elkonite welding tips have been used successfully for spot welding prefinished steel base metals. A special mushroom tip is used on the bottom contact and a fairly sharp rounded nose tip on the upper. To prevent injury to the surface, just a sufficient amount of current to make the weld should be applied. This involves an accurate weld current timer.

**Aluminum Base Metals:** In general, fabricating practices for zinc base should be used. Both nickel and chromium aluminum can be soldered by the recommended procedure. A heavier film of solder is required at the joint of a seam due to the exposed raw aluminum edge which must be bridged. Solder does not easily adhere to raw aluminum.

In stamping and drawing operations slightly slower press speeds are recommended.

Spot welding is difficult on coated aluminum. Apparently a higher amperage is necessary and for a shorter time. A practical spot welding procedure is now being developed.

## No "Sky-Hooks" Needed



■ Replacing eight 9 x 4-foot center section plates on this 75-foot boiler stack presented quite a problem until Weldrite Corp., Long Island, N. Y., solved the riddle by welding offset steel angles across the faulty section. The old plates then were cut out, leaving the stack's upper portion supported only by the angles until the new plates were welded in place. A 200-ampere welder and 200 pounds of 5/32-inch electrodes were used. The illustration shows a corroded plate being lowered to the ground. Courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

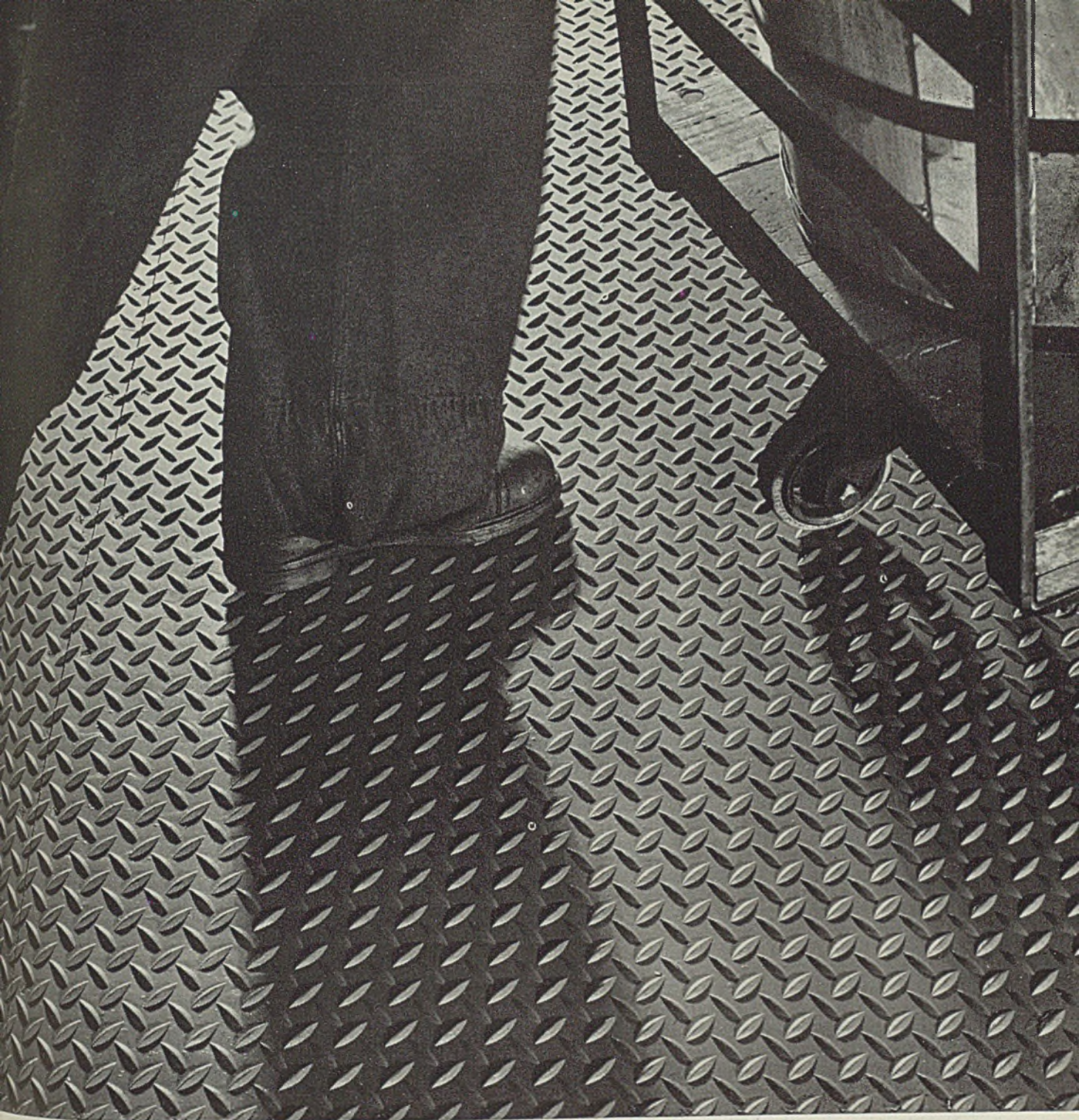


Photo shows the Super-Diamond Pattern of "A.W." Rolled Steel Floor Plate. Provides safe tread from any angle, under any condition.

**Making floors permanently safe . . .** Here's an end to flooring problems. With "A.W." Rolled Steel Floor Plate, there are no worn and slippery surfaces to endanger men on foot. No cracks or ridges to upset floor trucks. Toughest traffic will not damage or impair it. Oil-proof, heat-proof, fire-proof, crack-proof. Easy to clean, quick to drain. Pattern is uniform and can be readily matched when additional plates are needed. For complete information on "A. W." Rolled Steel Floor Plate, write for folder.

## **ALAN WOOD STEEL COMPANY**

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal—A. C. Leslie & Co. PRODUCTS INCLUDE—Steel Products in Carbon, Copper or Alloy Analyses : : Sheared

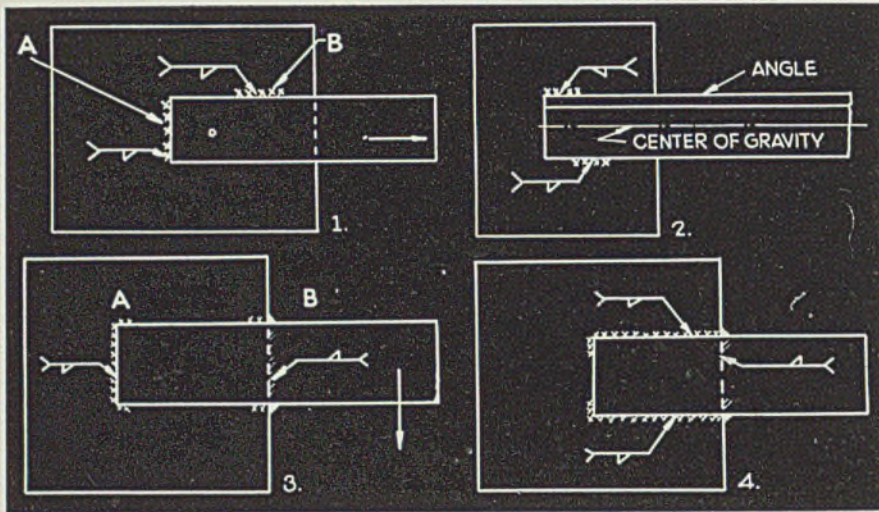


Fig. 1—Transverse welds are stronger than welds parallel to lines of stress. Fig. 2—Example of correct lengths of welds for equal load distribution. Fig. 3—Example of proper placement of welds to resist turning effect of one member at the joint. Fig. 4—Welds hooked around the corners to obtain resistance to tearing action when subjected to eccentric loads

## S T R E N G T H F A C T O R S

By E. W. P. SMITH  
Consulting Engineer  
Lincoln Electric Co.  
Cleveland

*The designer of welded constructions should be familiar with all factors that affect strength of welded joints. Type of weld and location are as important as strength of weld metal*

■ CALCULATION of the designed strength of any welded joint should include consideration of: Strength of weld metal, type of weld, location of weld in relation to parts joined.

In calculating the strength of fillet welds, a unit stress of 13,600 pounds per square inch is usually employed for tension, shear and compression since shear is present in practically every fillet weld.

For dynamic, vibrational or lifting loads, the unit stress of fillet welds, or the strength per lineal inch, should be reduced depending upon the severity of the load.

Approximately  $\frac{1}{4}$ -inch should be added to the designed length of fillet welds for starting and stopping the arc. The crater in the welds should be filled.

Table II gives the proper lengths of various sizes of fillet welds having shear values equivalent of various sizes of rivets.

The working strength of butt

welds, of 100 per cent penetration into the base metal, is usually calculated by multiplying the net cross-sectional area through the throat of the weld by 15,600 pounds for tension—by 13,600 pounds for shear—by 18,000 pounds for compression.

The location of the welds in relation to the parts joined in many cases has an effect on the strength of the welded joint. As an example, repeated tests reveal that, when other factors are equal, welds having their linear dimension transverse to the lines of stress are approximately 30 per cent stronger per average unit length than welds with linear dimension parallel to lines of stress. This is depicted graphically in Fig. 1 and is due to the stress distribution along the bead.

If the load on the weld is to be distributed properly, the welds should be so located as to take account of the shape of the sections joined. An example is illustrated by Fig. 2. The ratio of the lengths

of the welds at heel and toe of the angle is such that there will be no tendency for the angle to turn and thus cause eccentric loads on the joint.

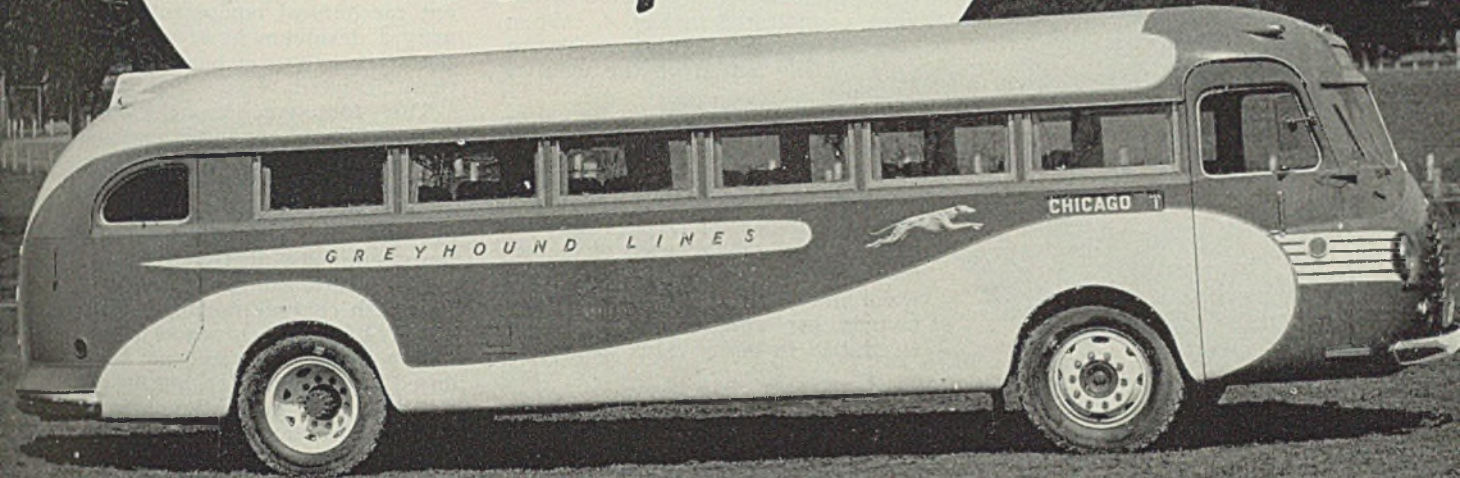
Resistance to a turning effect of one member at a joint is best obtained by welds well separated rather than by a single weld or welds close together. In Fig. 3 a single weld at A is not as effective as welds at both A and B in resistance to turning effect. Two small welds at A and B are much more effective than a large single weld at A or B only.

If possible, welded joints should be so designed that bending or prying action is minimized. Symmetrical joints are most desirable as they are much stronger than non-symmetrical joints, the stress in symmetrical joints being more evenly distributed.

In some designs it may be desirable to take into account the distribution of stress through the welds in a joint. It is known that any abrupt change in surface (for example, a notch or saw cut in a square bar under tension) increases the local stress or causes stress concentration. As an illustration of this principle, the weld in Fig. 5 will



# Yoloy Scores Again!



## EXCEPTIONAL RESILIENCY MAKES NEW BUS DESIGN POSSIBLE . . . .

In designing their new line of Flexible Clippers, the Flexible Company of Loudonville, Ohio, cut down dead weight by eliminating the chassis and made the body members carry the load. Regular carbon steel frame members were too heavy and permanent distortion much too likely. The resiliency of Yoloy, and the money saving qualities of less weight for a given strength, combined with a higher corrosion resistance made this possible.

When road conditions tend to distort the bus body and a sudden hard shock stresses the members, the resiliency of Yoloy eliminates the permanent "set" which might occur through the use of regular carbon steels. Yoloy retains its original position and the alignment of the body is maintained

-- making the new bus design a complete success.

In railroads, busses, mine cars, trucks, in whatever transportation equipment you build, Yoloy can save weight, increase strength and save money in haulage costs for your customers.



**THE YOUNGSTOWN SHEET AND TUBE COMPANY**  
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★  
Yoloy High Tensile Steel is available in sheets, strips, plates, bars, shapes, manufacturer's wire, welding wire, seamless pipe, and electric weld pipe.

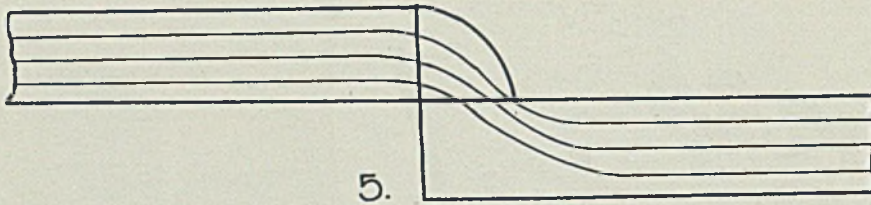


Fig. 5—A lap weld having poor distribution of stress through weld

have considerably more concentration of stress than that in Fig. 6. Fig. 7 allows a much more uniform transfer of stress with a resulting minimum of stress concentration. In many cases such concentration of stress might be small and of minor consequence. However, in heavy or

fore it is advisable in certain conditions to hook the bead around the joint as indicated in Fig. 4. When this is done, far greater resistance to a tearing action on the weld is obtained.

These allowable loads are based on a stress of 13,600 pounds per square inch in throat section as specified in structural code of American Welding Society. They are conservative, being based on a factor of safety of about five, since weld metal has 60,000 to 65,000 pounds per square inch ultimate strength. In many cases it may be

TABLE I—Safe Allowable Loads for Fillet Welds in Shear

Size of Fillet Weld Inch	Pounds per Lineal Inch	A.W.S. Code
$\frac{1}{8}$	1200	
$\frac{1}{4}$	1800	
$\frac{3}{8}$	2400	
$\frac{1}{2}$	3000	
$\frac{5}{8}$	3600	
$\frac{3}{4}$	4800	
$\frac{7}{8}$	6000	
1	7200	

TABLE II—Length of Fillet Weld to Replace Rivets

Rivet Dia. Size Inch	Rivet Shear Value @ 12,000 lbs. per sq. in.	Length of Fillet Welds (to nearest $\frac{1}{8}$ in.)— "Fusion Code" (Structural) Shielded Arc Welding (Inch)				
		$\frac{1}{8}$ in. Fillet	$\frac{1}{4}$ in. Fillet	$\frac{3}{8}$ in. Fillet	$\frac{1}{2}$ in. Fillet	$\frac{5}{8}$ in. Fillet
$\frac{1}{2}$	2356	1 $\frac{1}{4}$	1	1 $\frac{1}{8}$	$\frac{3}{4}$	1 $\frac{1}{2}$
$\frac{5}{8}$	3682	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1	$\frac{3}{4}$
$\frac{3}{4}$	5301	2 $\frac{1}{8}$	2	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{4}$
$\frac{7}{8}$	7216	3 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{4}$	1 $\frac{3}{4}$	1 $\frac{1}{2}$
1	9425	4 $\frac{1}{4}$	3 $\frac{3}{8}$	3	2 $\frac{1}{2}$	1 $\frac{3}{4}$

Note:  $\frac{1}{8}$ -inch is added to calculated length of fillet.

TABLE III—Properties of Weld Metals and Mild Rolled Steel

Material	Tensile Strength	% Elongation in	Density	Endurance	Notched Bar Test
	lbs./sq. in.	2 inches	grams per cc	lbs./sq. in.	ft. lbs.
Weld metal made with shielded arc	65,000 to 75,000	20-30	7.84 to 7.86	28,000 to 32,000	25-80 (Izod)
Mild rolled steel	55,000 to 65,000	20-30	7.86	24,000 to 28,000	20-80 (Izod)
Weld metal made with bare or washed electrode	40,000 to 55,000	5-10	7.5 to 7.7	12,000 to 15,000	8-15 (Izod)

\*Maximum stress in outside fibres, 10 million reversals without failure, rotating beam test.

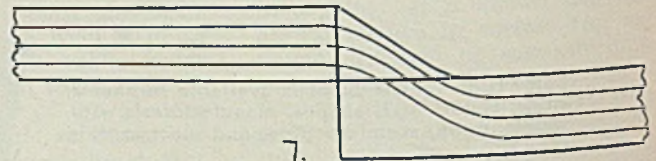
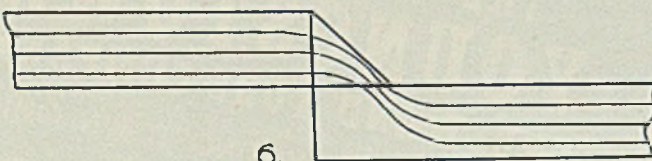
repeated loadings this matter should have the attention of the designer.

Stress in a weld having its linear dimension approximately parallel to the line of force is not evenly distributed. It is not at all unusual under many load conditions to have the stress at the ends of the weld greater than in the middle. There-

exceeded by 20 per cent or more, depending upon the type of load and character of joint. Then, it would

Fig. 6—A lap weld having a more even distribution of stress through weld

Fig. 7—Example of lap weld in which there is a fairly uniform transfer of stress through the weld



still give a factor of safety of about four.

Interesting comparisons between physical properties of weld metal made with shield and unshielded arc and mild rolled steel are afforded by Table III.

## Traces Development of The Forging Industry

■ Forging is one of the oldest means of mechanical working of metal, and yet forging with present mechanical equipment is primarily a development of our modern times, its status extends back less than 100 years.

This fact was brought out by John L. Young, manager, machinery sales, United Engineering & Foundry Co., Pittsburgh, at the Pittsburgh district meeting of the Association of Iron and Steel Engineers, William Penn hotel, Pittsburgh, Nov. 18.

He mentioned that up to the twentieth century forging was used largely by the machine tool industry. Today motor cars could not be produced without the forging industry.

A hammer forges the surface of the steel leaving its core unaffected whereas a press imparts deeper effects on the grain structure. On small commercial forgings a hammer produces faster and is economical. A press is more effective where over-capacity forgings are worked.

One of the largest forging presses ever constructed is now being built. It is a 14,000-ton unit and stands 57 feet above and 19 feet below floor level.

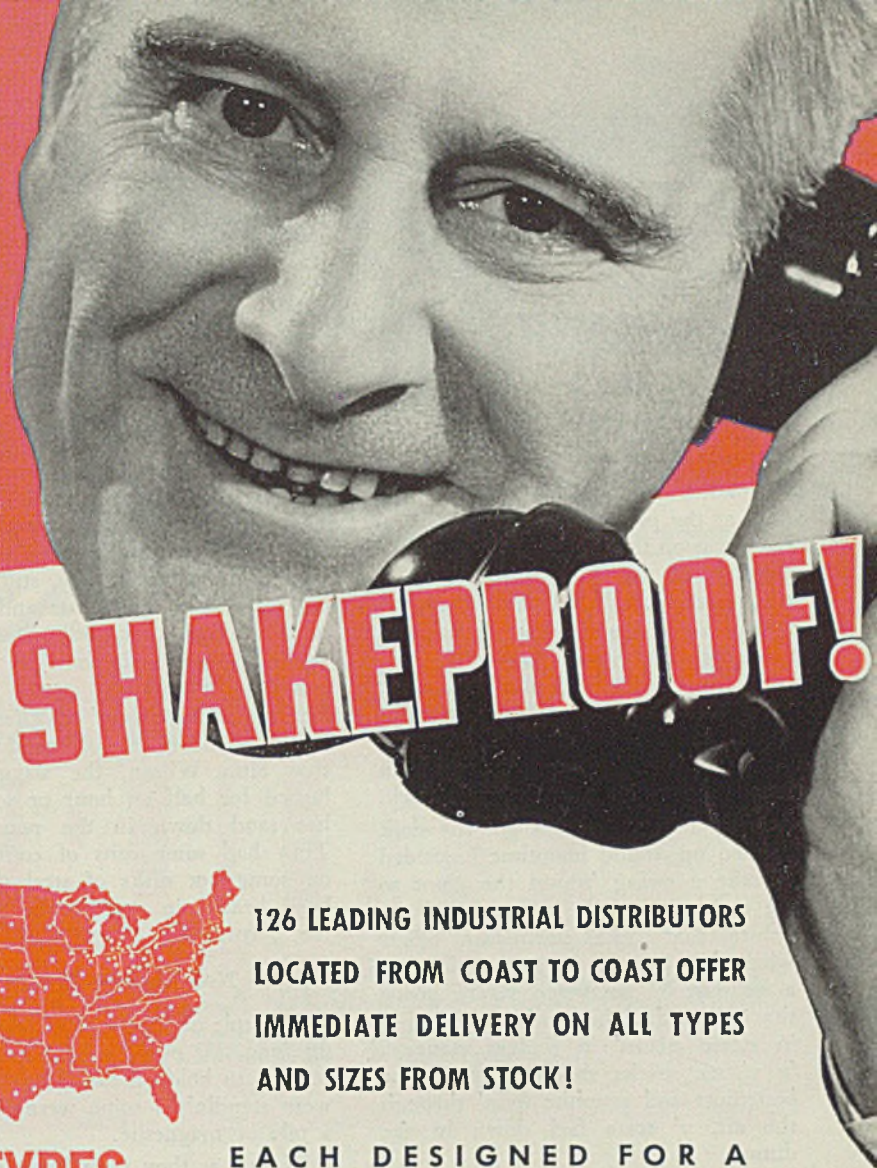
Discussion brought out that three types of furnaces are being used for heating shell steel—the batch, pusher and rotary types, the latter finding greater demand at present. Shellmakers are maintaining a furnace temperature of 2300 degrees Fahr.

## Belts Now in Stock

■ Because of the increasing use of its short, flat endless belts on short-center and pivoted-motor-base drives, Manhattan Rubber Mfg. division, Passaic, N. J., announces that Condor whipcord endless belts are now available from stock for prompt shipment in a number of sizes and in two styles.

The two styles carried are capable of handling drives from  $\frac{1}{4}$  to 25 horsepower.

Need  
Lock Washers  
in a hurry?



'phone for **SHAKEPROOF!**



**EXTERNAL**—for U.S. Standard nuts and large head machine screws, such as binder, oven and washer head types.



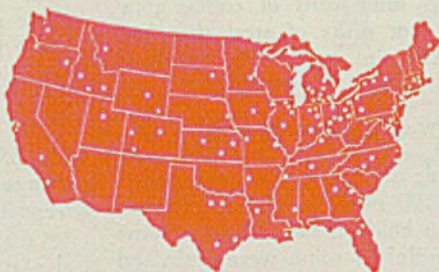
**INTERNAL**—for S. A. E. nuts and small head machine screws, such as round, hexagon and fillister head types.



**COUNTER-SUNK**—for all countersunk machine screws, such as flat and oval head types.



**EXTERNAL-INTERNAL**—for applications where a large bearing surface is necessary.



**126 LEADING INDUSTRIAL DISTRIBUTORS LOCATED FROM COAST TO COAST OFFER IMMEDIATE DELIVERY ON ALL TYPES AND SIZES FROM STOCK!**

**FOUR TYPES . . . EACH DESIGNED FOR A PARTICULAR LOCKING JOB!**

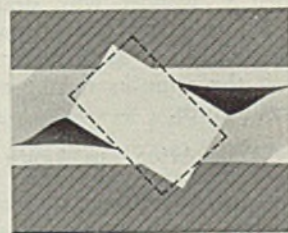
A leading Industrial Distributor located near you is ready to deliver from stock the exact sizes and types of Shakeproof Lock Washers that you need to give your product thorough protection against vibration. The powerful locking action of the exclusive tapered-twisted tooth design plus the fact that there are four separate types—each one engineered to lock a particular kind of screw or nut fastening—assures greater locking efficiency. Don't merely ask for lock washers—specify Shakeproof!



**FREE SAMPLE RING!**

Ask your distributor's salesman for a free test ring of Shakeproof Lock Washers. Test their locking power in your own shop—you'll quickly realize how they can help improve the performance of your product!

If you don't know who handles Shakeproof in your city, write us and we will send you the name of our nearest distributor immediately!



**Actually Locks Tighter Under Vibration!**

When vibration attacks a nut or screw locked with Shakeproof, the tapered-twisted teeth dig deeply into both surfaces, setting up a powerful lock. As vibration increases, the teeth dig deeper—never allowing any loosening action even to start!

**SHAKEPROOF LOCK WASHER CO.**

*Distributor of Shakeproof Products Manufactured by ILLINOIS TOOL WORKS*

**2525 North Keeler Avenue, Chicago, Illinois**  
Plants at Chicago and Elgin, Illinois  
In Canada: Canada Illinois Tools, Ltd., Toronto, Ontario  
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**SHAKEPROOF**

SEMS Fastener Units . . . Lock Washers

"Fastening  
Headquarters"

Thread-Cutting Screws . . . Locking Screws

# BETWEEN HEATS

WITH *Shorty*



## ■ Say Fellers:

Few days ago was Thanksgivin' and I wouldn't 'ave missed puttin' in my licks at the plant for anything. Everybody was on the job from the big boss' clear down the line to the hunkies that sweep the yard. Everything is hummin'. I don't know of a single wheel in the whole plant that isn't turnin'. Y' see we're hittin' 'round 95 per cent operation same as most other plants in the country 'n you can betcher life we're scratchin' to keep tonnage movin' out on the main track.

Well, anyway, after I got my desk cleaned up 'round noontime I decided to take a swing 'round the plant to see if I could shake off some of the "blues" that strikes steelmakin' fellers when they have to be at the plant on a holiday. Y' see when you're inside the mill and y' hear whistles blowin' 'n steam hiss'n 'n sledges clangin', 'n y' see sparks shootin' out of the bessemers and graphite flyin' through the air, y' sorta feel down in the dumps.

Y' wonder what the Mrs. and the kids are doin' at home. Y' wonder if they've got their feet under the table munchin' turkey n' all the trimmin's. 'N then y' wonder why steel mills weren't made to shut down on Thanksgivin' day so a feller could enjoy it the same as the boys up at the main office.

## Went After 'em Again

'N so jus' when the temperature of my feelin's got pretty low I put on my reefer, pulled the collar up 'round my neck, slipped a cap on 'n started out in the frosty air over to the steel mill. I took the walkway leadin' up over the highline which enters the chargin' floor of the open he'rth shop at the end of No. 12 furnace. 'N when I pulls open the door and steps inside the buildin' a sight greeted my eyes. Never had seen anything like it in all my steelmakin' days.

The fellers workin' on the chargin' floor had a couple of lengths of galvanized roofin' sheets restin' on some wooden kegs to serve as a table top down at No. 6 furnace. Newspapers were laid over the sheet iron 'n spread out on this covering were paper plates

loaded with food that would make a tongue-tied guy lick 'is lips. All had come out of dinner buckets which were settin' back near the instrument panel. There was turkey, stuffin', celery, cake, pie, doughnuts and a lotta other things. 'Ol Bill Duffy had opened a couple of cans of cranberries that he had hid in the drinkin' fountain all mornin' to keep cool. They had a big pile of baked potatoes that Slim Wilson, the slagger, had buried for half an hour or so in the hot sand down in the pourin' pit. They had some cans of coffee goin' on some hot disks of steel that had been heated in one of the ports of No. 7 furnace.

## Not Enough Seats

A couple of benches had been pulled up 'long side of the table but it wasn't enough to hold all the fellers so some were standin' 'n some were sittin' on a pile of magnesite.

'N jus' as they were 'bout ready to start munchin', I came on the scene 'n I guess the gang was sorta scared. But I walks right up and joins them 'n sez, "I smelled the coffee clear over at the office 'n decided I'd better get a place at the table 'fore all the stuff was gone." 'N with that I crowded in between a couple of fellers in sweat shirts with blue glasses restin' on their foreheads and sez, "Let's go."

"Wait a minute, fellers," shouted Sandy Sanderson, an ol' Scotchman who 'tends No. 1 gate. "This is Thanksgivin' day and we're goin' to give out some thanks 'fore we start messin' up this food. We're livin' in a country where we can come and go without havin' to sleep in tunnels at night like they're doing over there. So if you haven't used your harp for a long time, then this Thanksgivin' is the time to get 'er out and play. Use it. Every man here that handles a shovel can learn to play some Thanksgivin' tunes. Think and then you fellers will thank. Recall your many blessin's 'n then you'll soon begin to finger the Thanksgivin' harp."

"Never heard y' play one before, Sandy," sez Mickey Duffy. "Last time I see y' playin' anything was some

kind of a contraption that looked like your ol' woman's sofa pillow with some exhaust pipes stickin' out."

"That so," sez Ol' Sandy. "Listen to me, Irish—No one wants to live in a house where there is quarrelin' goin' on all the time. Same with one's country. Folks want to live in peace and be happy. Don't y' wanta say 'thanks' for such a land as ours—huh? Don'tcha?"

Sure was funny to see the bunch takin' it from Sandy without battin' an eye.

## Dropped in on the Fellers

"When your boss does somethin' for y', it's an everyday courtesy to say 'thanks', isn't it? Then why don't y' lift up your head in thanksgiving today? I sw of you fellers workin' on the furnaces here know what hard times really are. We're all livin' like kings compared to our forefathers and the people 'cross the water. Come on, fellers, off with your hats 'n put your chin on your chest 'n thank God for these good things. He says, 'In every-thing give thanks'. 'N, fellers, if you'll do this you'll 'ave 365 happy Thanksgivin' days."

'N with that every hat came off. Heads dropped. 'N they all said some things that aren't anyone's concern 'cept their own.

'Y should 'ave seen them pitch into the stuff on the table. There was enough chatter to make a cage full of monkeys run to a dugout. 'N then one by one they slipped off to their furnaces 'n 'fore y' knew it, there was a different set of faces at the table for y' see the late comers had been watchin' the heats while their buddies had been doin' their stuff with the turkey.

The whole affair was entirely too short but steel was in the makin' 'n tappin' had to go on. Jim Fowler climbs up on 'is chargin' machine and starts pullin' levers that set the chargin' boxes full of scrap tumblin' on the hearth of No. 7 furnace. Bill Hobart sends a couple of short blasts from his chubby little dinkey ingine that brings the chargin' boxes on the floor, so as to thank the boys for lettin' him in on the party.

Shovels started rapping on the steel plate floor and soon the boys had steel comin' out of No. 6 in great shape. Wish you fellers could 'ave been there for it was a gladsome Thanksgivin' dinner that was eaten on the chargin' floor that day.

So long, fellers. I'll be seein' ya.

*"Shorty" Long*

STEEL

There must be a reason why



MANY OF THE  
LARGEST  
RAILROADS



LEADING  
PUBLIC  
UTILITIES



PROMINENT  
ENGINEERING  
CONSULTANTS



OUTSTANDING  
INDUSTRIAL  
CONCERNS

SPECIFY AND USE REPUBLIC

# ELECTRUNITE

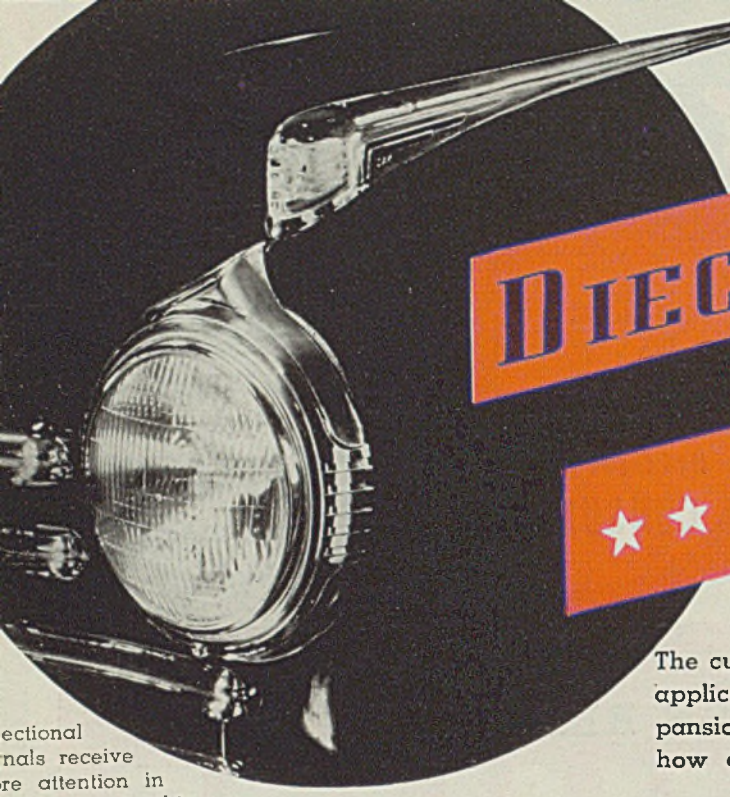
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ELECTRIC RESISTANCE WELDED BOILER, CONDENSER  
AND HEAT EXCHANGER TUBES

-In fact, there are 6 important reasons,  
and here they are:

- 1. Strong, safe and sound**—ELECTRUNITE Tubes are cold-formed from flat-rolled steel and electric resistance welded into a homogeneous tube with a *WELD AS STRONG AS THE WALL*.
- 2. Easy to install**—Because they are *consistently UNIFORM* in diameter, wall thickness, concentricity, straightness and ductility, ELECTRUNITE Tubes slide through tube sheet holes freely and expand, prosser, roll in and bead easily. Users report up to 30% savings in installation costs.
- 3. Scale-free surface**—ELECTRUNITE Tubes are full normalized in a controlled reducing atmosphere—without oxidation and *WITHOUT THE FORMATION OF SCALE*. As a result, ELECTRUNITE Tubes have a glass-like surface—entirely free from corrosion-inviting scale and scale pits.
- 4. Thoroughly tested and inspected**—Samples taken at various stages in the manufacture of ELECTRUNITE Tubes are subjected to severe destructive tests, as a matter of rigid routine. Every tube is tested under hydrostatic pressure far in excess of code requirements and each tube is painstakingly inspected by a thoroughly trained "watch-dog of quality."
- 5. Wide approval**—ELECTRUNITE Tubes meet the requirements of A. S. M. E.; U. S. Dept. of Commerce, Steamboat Inspection Service; American Bureau of Shipping; Lloyd's Register of Shipping; Association of American Railroads.
- 6. Availability**—ELECTRUNITE Tubes are made in a complete range of sizes and gauges—in carbon steel, copper-bearing steel and \*Toncan Iron. They are stocked by distributors in larger cities.

Why not investigate for yourself the advantages of Republic ELECTRUNITE Boiler, Condenser and Heat Exchanger Tubes? We shall be glad to send literature or to have an engineer call at your convenience. We can give you names of well-known users, too, if you wish. Write Steel and Tubes Division, Republic Steel Corporation, Cleveland, Ohio.



# DIECASTINGS

## ★★ SHINE IN '41

ectional  
nals receive  
re attention in  
cars, as in this  
w Chrysler

The current crop of new cars includes many interesting novel applications of diecastings. These as well as important expansions of previous applications are described here to show how diecasting presents increased possibilities for making many parts better and at lower cost

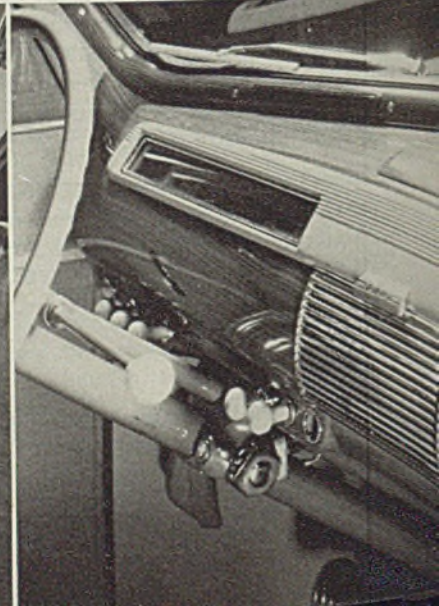
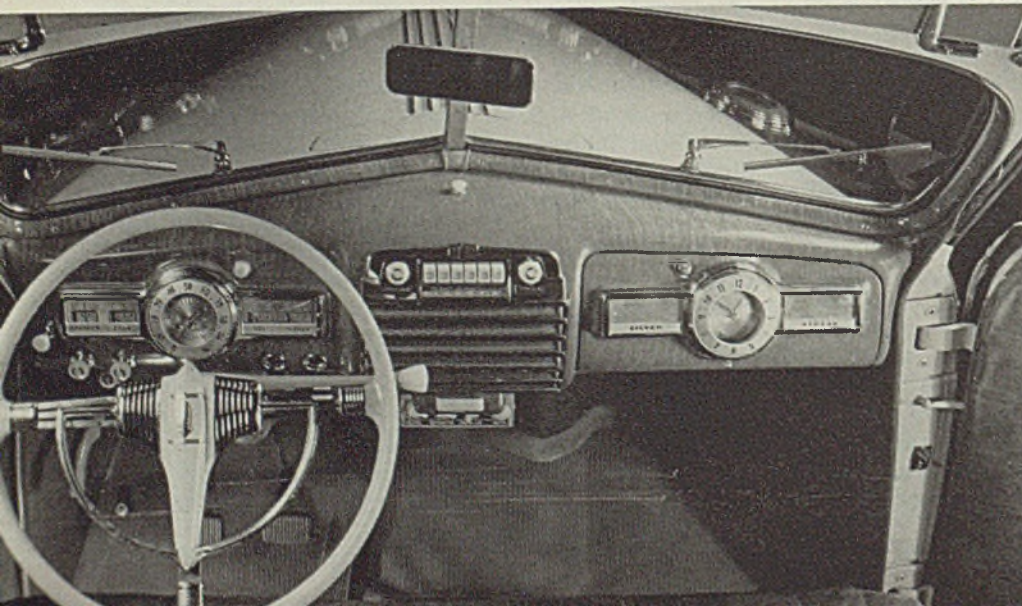
■ ZINC alloy diecastings, most of them heavily plated with nickel and chromium, furnish more of the highlights on 1941 editions of American cars than in any prior year. Hidden below the surface and usually requiring no applied finish, there also are a greater number of diecastings than before. As a result, every diecaster equipped to handle automotive business finds his plant at maximum capacity. One reports more than 200 new dies in service and many other shops nearly equal this record. Plants with facilities for plating diecastings in large quantities and to exacting specifications are correspondingly busy.

Except for front and rear bumpers, diecastings dominate among plated external parts. They also contribute to enameled areas. In interiors, where much more bright trim is used, diecastings again furnish most of the highlights. Several cars have instrument panels covered with diecast grilles, frames, moldings

and glove doors. Even knobs formerly in plastics have reverted to diecastings. Steering wheels carry their complement of brightwork over diecast surfaces. Hardware continues mainly diecast.

Examining the interiors of such cars as Buick and Olds reveals large castings which include not only the radio grille but which also provide housings or frames for adjacent units. Many makes, including some Chryslers, have diecast glove doors, some with a separate or integral frame for a clock. A few have large areas covered with wood graining set off by bright integral moldings. Buick, Mercury and many General Motors cars use diecast knobs, some with decorative plastic inserts. As heretofore, diecast instrument frames are popular. Pontiac, for example uses a

One die was used to produce both instrument and clock housings at right and left on the Pontiac dash shown at left below. Horn ring and steering post cover also is a combination one-piece zinc-alloy diecasting. Ford de luxe, below, carries a diecast panel that extends practically the entire length of the dash



Front end of the new Dodge is outstanding example of important part played by diecastings. Grille incorporates head lamp and parking lamp housings

frame duplicated right and left for clock and speedometer units, respectively.

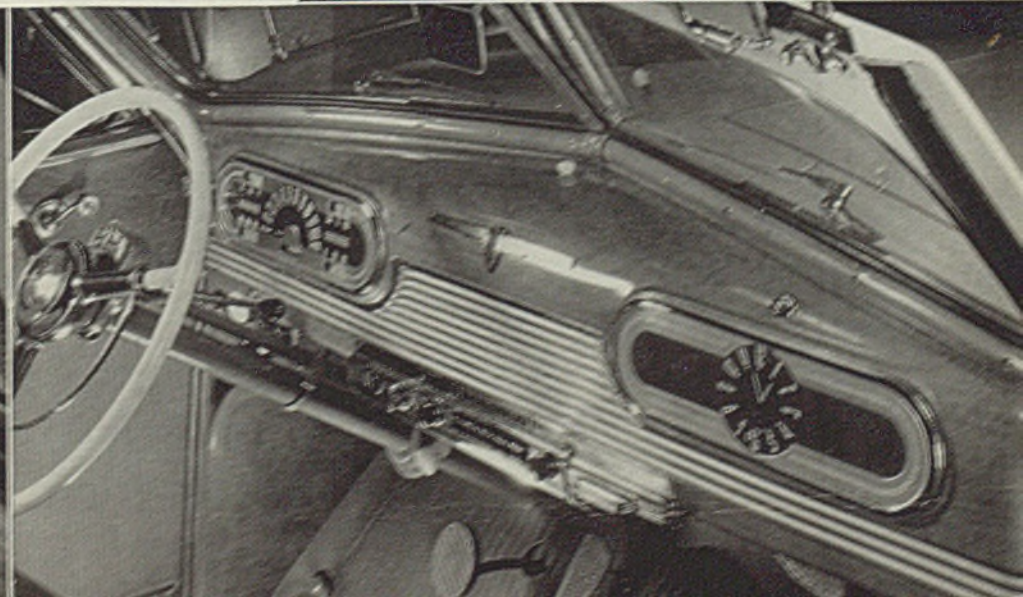
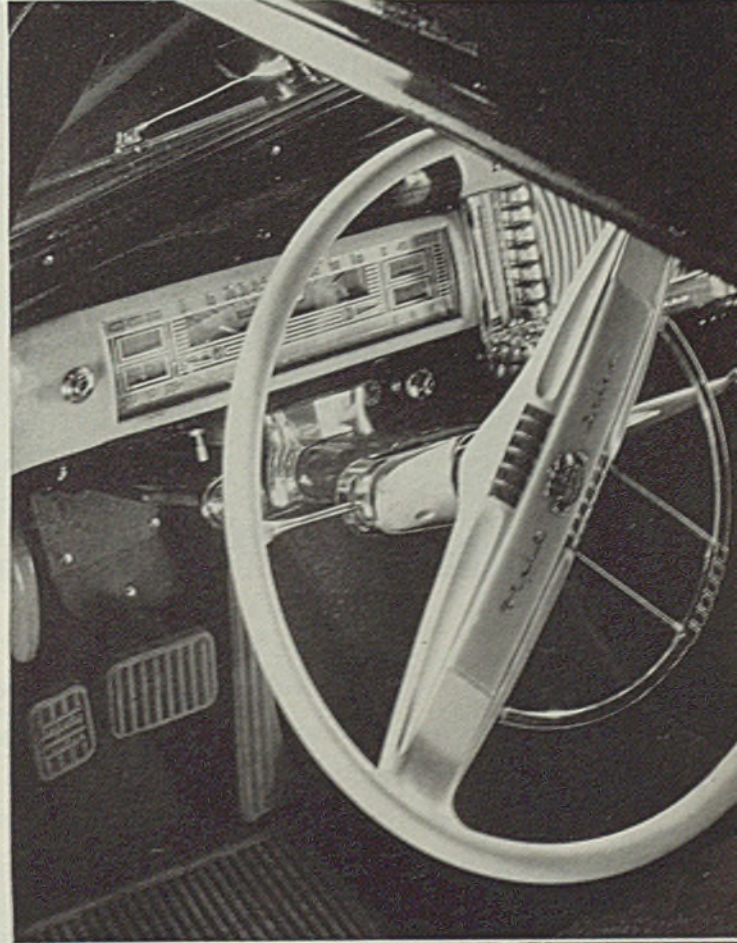
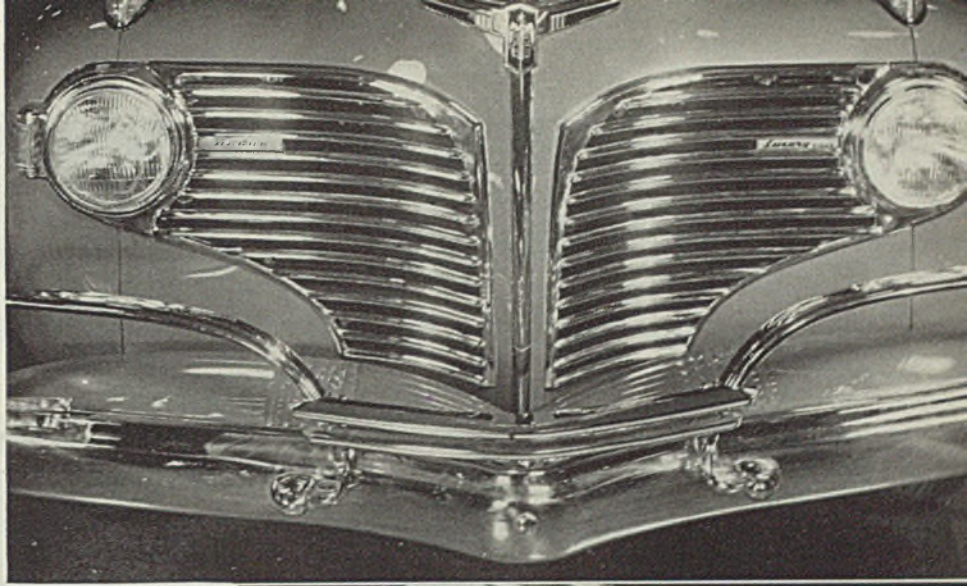
Many horn rings have given place to sectors to leave the two upper quadrants of the steering wheel open—an aid in viewing instruments. Both full rings and sectors are usually diecast. Also there is the decorative steering wheel cap with integral extended arms easily reached by the thumbs. Some Mercury, Nash and Pontiac cars use this control, decorated with plastic parts added to the diecasting.

Cadillac for the first time is using wide interior diecast moldings at the belt line. Some are from the same dies as running board moldings. Exterior moldings in some models extend across fender skirts and wheel covers. Many cars make use of diecast interior trim, especially for medallions on the garnish molding below windows.

Some models of Packard, Chrysler and Lincoln are among those equipped with new hydraulic window lifts. An electric switch, when moved up or down, results in corresponding movement of the respective window. Several diecast parts in this system constitute new mechanical applications.

There is an increased use of direction signals with diecast housings for control parts on the steering column and for the signal lights. Automatic transmissions used in combination with fluid drives, including those on some Chrysler makes and on Olds, have diecast parts. Other diecastings are used with vacuum shifts, now standard on Chevrolet and available

Right, fluid drive controls of new Chrysler employ several diecast parts. Some are shown here. Below at right, diecast ornamental dash panel strip of new Olds cleverly incorporates the radio speaker grille. The Hydramatic shift housing, horn ring and ash tray door also are diecast



# ECONOMY IN STEEL MILL HAULAGE ..... WITH WHITCOMB LOCOMOTIVES



Switching and haulage service in modern steel mills requires the best equipment available, particularly at a time like this, when all plants are operating at near peak capacity. Locomotives must withstand terrific punishment under these conditions of long hours of continuous service—and they must perform with minimum maintenance attention. Pictured above is one of many Whitcomb 50 ton Diesel-Electrics. A design especially developed for heavy-duty steel mill service; like other WHITCOMB LOCOMOTIVES effecting economies in mills and industrial plants all over the country, it is our best salesman, second only to our clients. We assume that you would like to obtain particulars concerning WHITCOMB LOCOMOTIVE performance and construction, so if you ask for information, we would be pleased to send you a copy of our latest book: "Maximum Performance at Low Cost".



*The Whitcomb Locomotive Co.*

SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

PLANT AT ROCHELLE, ILLINOIS



on other makes. Practically all cars have diecast brackets for shifter lever shafts and some for parts of the lever itself or for other portions of the shifting hook-up.

Radiator grilles continue most prominent in front end styling. A preponderant number are diecast as heretofore. With the exception of Cadillac and Olds, which make use of a large one-piece diecast grille, and the Willys "Amercar," which uses an entirely different design extending straight across the front below hood level, the grilles are all cast in two or more sections. Chrysler and Dodge have gone back to the diecast form and Pontiac to a new design in stamped form. Ford's use of diecast grille sections is extended and Chevrolet is using, for the first time, a grille in which the frame is diecast, in six sections. This leaves all cars in the low price group, except Plymouth, with grilles which are partly or full diecast, likewise all cars in higher priced brackets except Pontiac. Hence grilles alone will account for a large tonnage of diecastings.

Most grilles are flanked by headlamps with diecast bezels. Some include openings for parking lights or direction signals. In others, the

parking lights are separate diecastings with a long integral streamlined tail for fender ornamentation in certain designs. A new note is struck by Cadillac where a combination casting serves as a tail light housing and cover for the gas tank filler cap. Other new uses of diecastings in lighting equipment include reflector housings for "courtesy" lights and bezels for dome lights.

Buick and Olds are among cars having diecast fittings on fenders to provide high-lighted "speed lines"—lines to accentuate the appearance of speed and length. Many hoods have diecast fittings. Other diecastings take the place of louvers. Diecast car name or model designations add a decorative touch. Some body and hood moldings are diecast because the final plating in chromium perfectly matches other adjacent diecast parts.

Buick's use of two carbureters means a further increase in diecastings under the hood. There, too, are many other diecastings about which the average car owner knows little or nothing. These complex castings, rapidly and accurately produced in dies, play an important function in reducing costs without any sacrifice in quality.

as 40-foot radius or 143 degrees. The average steam consumption is 578 pounds an hour. When charged to 120 pounds pressure per square inch, it performs average work for a period of five hours before recharging is necessary. The time for charging is about 17 minutes.

## Outlines Legal Status Of Federal System

■ *Federal Regulatory Action and Control*, by Frederick F. Blachly and Miriam E. Oatman; cloth, 356 pages, 6 x 9 inches; published by Brookings Institution, Washington; supplied by STEEL, Cleveland, for \$3.

This volume, prepared by the Institute for Government Research of the Brookings Institution, is designed to be largely preliminary in nature, describing briefly the organization, legal status and relationships of the federal administrative system. It also examines various plans advocated for its improvement.

The primary object of the book is to contribute toward an understanding of the multitude of problems in law and administration which must be solved if federal intervention in the economic realm is to be efficient and legal. No questions are raised concerning the value of the constitutional structure within which federal administration must function or the wisdom of congress in adopting certain economic policies and establishing the present type of government intervention.

The inquiry is confined to the narrower problem of explaining the principal features of the administrative system through which the policies are carried out and evaluating suggestions for the improvement of that system, without reference to possible changes in the constitution.

## Fireless Locomotive Serves Eastern Open-Hearth Shop

■ LOCOMOTIVE haulage at open-hearth plants offers numerous problems, especially at shops where capacities and weights of ingots have been increased. Bigger ingots and heavier charging trains require heavier and more powerful locomotives to haul them. Standing in the way of larger engines are narrow track gages, extremely sharp curves and limited height and width clearances.

The fireless locomotive not only solves the problems of clearances, curves and power requirements at open-hearth plants, but offers an economy of operation. Waste-heat steam at pressures as low as 100 pounds can be used for the operation of a locomotive of this unusual type.

Maintenance and hostling expense usually amounts to less than 20 per cent of the upkeep cost of a conventional steam locomotive. Even when operating 24 hours a day the availability of the fireless loco-

motive frequently averages higher than 99 per cent.

The locomotive shown in the accompanying illustration and built by the Heisler Locomotive Works, Erie, Pa., weighs 47 tons. It is 9 feet 2 inches high and 6½ feet wide. It will pass curves as sharp



Fireless locomotive negotiating sharp curve at open-hearth shop located in Eastern Pennsylvania

# LIGHT "BARRIERS"

## Can Protect Your Plant

*As a protection against sabotage, adequate floodlighting of boundary fences, plant yards and building exteriors affords an important precaution. Basic principles are quite simple*

■ OUR World war experience proved that *industry's first line of defense against sabotage is LIGHT*. A fence of light is a barrier through which no intruder dares pass. It creates a "no man's land," easily patrolled as any suspicious person is instantly detected.

The purpose of protective lighting is to deter intruders from entering the property and to make them readily visible if they do enter. The amount of light and type of distribution required depends on the importance and vulnerability of the property as well as other means of protection such as guards, fences and alarms. Each property must be studied to determine the most

vulnerable places which then should be adequately lighted. While no one system of lighting will take care of all cases, there are fundamental floodlighting principles which can be applied to provide adequate protective lighting to meet most conditions.

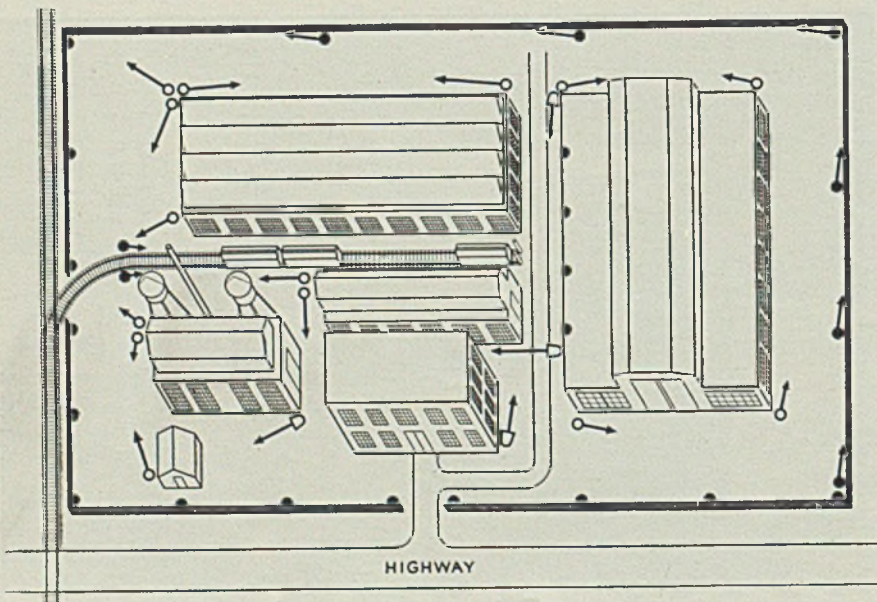
Fencing a property is important because the more difficult the entrance—the more conspicuous the intruder can be made if he attempts to enter, the more effective the guard can operate. Fencing should be lighted because guards cannot see in the dark and a properly lighted fence not only reduces the number of guards required but simplifies patrolling.

It is desirable to have guards located in shadows so an intruder cannot know their location—so they may see the intruder more easily. Also the visibility of distant points is materially affected by the amount of light in the immediate vicinity of the guard. If he is standing in a lighted area, more light must be provided at the distant point to provide equal visibility.

### Keep Light from Guard's Eyes

The conventional way of lighting a fence line is to place a narrow beam 1000-watt floodlighting projector at each corner and place additional projectors approximately 300 feet apart. The projectors should all be aimed in the direction in which the guard is patrolling, so that the light does not shine in his eyes. Local conditions, such as the type of fence, the location of the guard, the method of patrolling, the size of the yard, the location of the building and the surroundings of the yard may make a different system of lighting more effective.

If buildings are close to a fence line it may be desirable to place the floodlighting projectors on the roofs of adjacent buildings and light the area up to as well as beyond the fence. If there is a wire fence and the guard is patrolling inside the fence, it may be desirable to use a wider beam projector and direct



Typical plant layout and how it is lighted by various types of reflector units. Illustration courtesy Benjamin Electric Mfg. Co., Des Plaines, Ill.

most of the light outside of the fence so that the edge of the beam is along the fence line. This leaves the guard in relative darkness and provides a wide space outside of the fence in which he can observe any intruder.

If the fence is opaque, it should be painted white. Thus an intruder will stand out in bold silhouette against the light background. In other places as well it often is possible to lighten backgrounds which help the guards to see an intruder in silhouette.

In some cases, particularly in small yards, it is entirely feasible to light the fence line with units spaced 50 to 75 feet apart and mounted high enough so a passing person cannot easily strike the lamps. Place the units sufficiently close together so no large section is in darkness if one lamp is broken or burned out. Close spacing is also desirable to provide the coverage necessary to reveal intruders in fog and bad weather when they are most likely to operate.

#### Many Vulnerable Areas

While the boundary fence is the first line of defense, there are many vulnerable areas around a property which should receive careful study to provide satisfactory lighting. Some of the most vulnerable of these are: Spaces along railroad tracks and highways, narrow alleys between buildings, narrow spaces between buildings and fence lines, all entrances to yards, entrances to important buildings, areas where there is concealment such as shrubbery or outbuildings, near to the fence line, streets that dead end at the property line.

A number of freight cars parked in the yard will provide a point where a large group may hide and sally forth to do their destructive work. Piles of lumber or stacks of other material affords shadow in which an intruder can find shelter and wait for the opportune time to strike. In spots like these, small fires may be started to distract attention from other locations where greater deprecations are planned.

Accompanying diagram shows a typical medium size plant enclosed on four sides by a fence and fronting on a main highway with a railroad along one side and a spur track into the yard.

The primary problem here is fence lighting. Along the highway, wide-angle porcelain enamel flood-

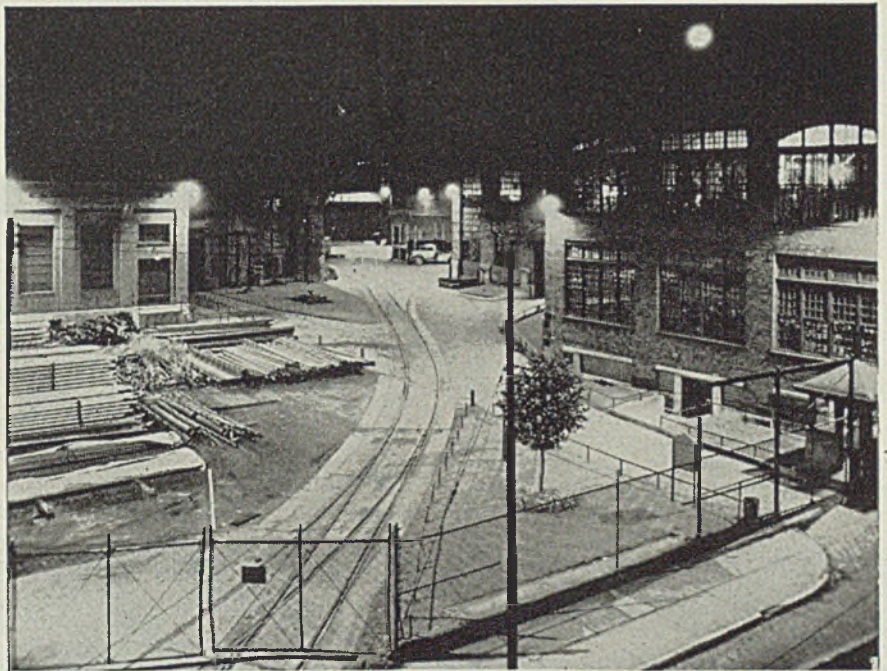
lights are used at or near the fence line pointed outward at right angles to the highway and directed downward to reduce possibility of glare to passing motorists. These floodlights are also used along the fence paralleling the railroad and are similarly aimed and directed to minimize glare. Floodlight projectors are indicated along the other fence lines where no glare is present. They should be concentrated-beam types and directed nearly parallel with the fence as shown.

Particular attention has been given the spur track and its alley between the buildings, floodlighting projectors being recommended to throw light the length of the spur and brilliantly illuminate its gate through the fence. Additional medium-spread and concentrating-

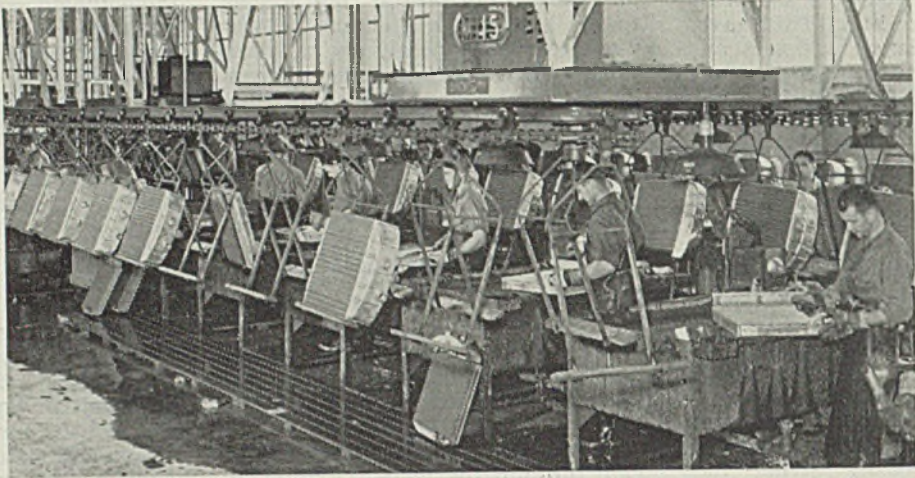
beam floodlights are indicated on the building corners near the spur entrance—one of the most vulnerable points in the entire plant layout.

The factory street on the right-hand side of the office building is lighted with concentrating-beam floodlights directed the length of the street from each end. In addition, there are porcelain enamel floodlights on the roof of the adjacent building.

General yard lighting, for protection as well as to facilitate night operations, is provided by medium-spread and concentrating floodlights—depending on the size of the area and their distance from it. Floodlights can be located advantageously on building corners and directed as required.



Here are two examples of good protective lighting. Note areas inside and adjacent to the boundary fence are well lighted as well as all interior yard areas. In lower view, note all stock piles are illuminated with no shadows



Here operators give pressure test to radiator to detect and correct leaks. Photos courtesy Mechanical Handling Systems Inc., 4600 Nancy street, Detroit

# New Radiator Plant Spotlights Efficient Handling

## Part II

■ IT MAY BE well now to back-track and to trace operations involved in fabricating brass tanks and steel sidewall assemblies of the radiator units. Top tanks are made in two pieces, upper and lower. The upper piece is formed in the following sequence of operations: Cut to length; draw; trim four sides; punch filler hole; punch inlet hole, four rivet holes and identification. One shear and four medium-size punch presses handle this piece.

Top tank bottoms are formed as follows: Cut to length; notch and form; edge; roll edge; tin and solder to upper half. These operations are handled by presses and a roll machine.

Bottom tanks are in one piece and proceed through the following sequence of shear and press operations: Cut to length, draw, trim

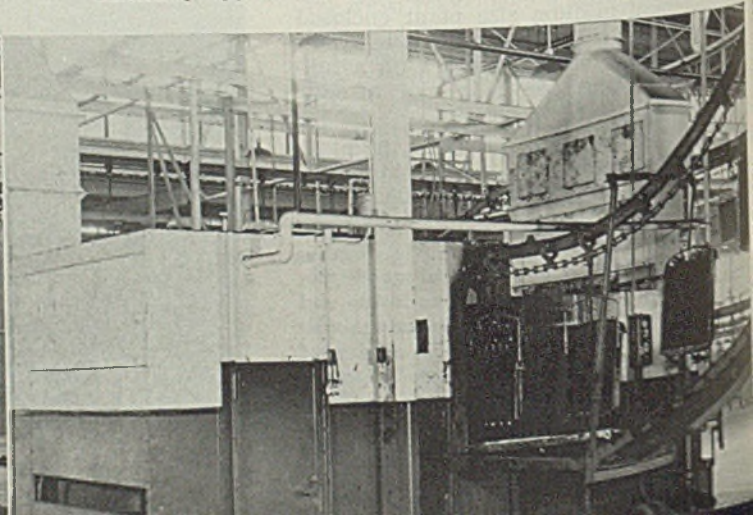
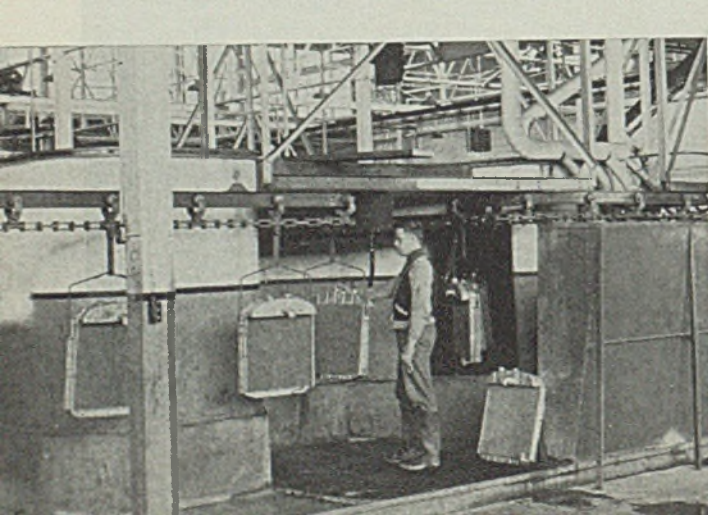
four sides, punch outlet and drain holes, assemble and set tie clips. During assembly, top tanks are

handled off and on a merry-go-round conveyor 320 feet in length, carrying triple-deck wood trays on 48-inch centers. Six tank assemblies are carried on each tray. Parts from the presses which fabricate the tanks are moved to the assembly conveyor on a 20-inch belt conveyor, 96 feet in length, which transfers them to a second belt conveyor at right angles to the first, 44 feet in length, and then to the assembly conveyor.

Sidewall strips and reinforcing, as mentioned before, are formed from lead-coated plate to facilitate soldering. This material is received in sheets 31½ x 60½ inches for

Conveyor carries assembled radiators through washer booth where both inside and outside are cleaned

Radiators, lower right, are conveyed through spray booth where black paint is efficiently applied automatically



the sidewall strips, and 35½ x 77½ inches for the reinforcements. Six presses are operated to blank and perforate the strips, then form them to shape, following which they are transferred to skids which are moved to spot welders where the strips and reinforcements are welded, two at a time, 14 welds to each piece. The sidewalls then are trucked to the proper assembly station, previously mentioned.

Returning to this point, when sidewall strips have been soldered in place the units are hung on an 86-foot conveyor with 29 hangers which moves them to the second and final test, also made under air pressure, and then to the wash conveyor which is 380 feet long, 28 carrying hooks on 40-inch centers, and travels through a special type of washer cabinet in which a hose is placed into the inlet fitting and air blown through it, followed by a cold water spray. After washing, the units travel past a strong air blast which partially dries them off.

They are next hung onto the main oven conveyor, 2280 feet in length, with hooks on 40-inch centers.

This, the longest conveyor in the plant, follows a devious path, first through the lower section of the oven where temperature is held at 240 degrees Fahr., then to a spray booth where black paint is sprayed over the exterior, then back through the upper section of the oven where temperature is held to 220 degrees, and finally to the shipping department.

TABLE I—Conveyor Tabulation

	Length, feet
Bake oven conveyor .....	2280
Tank delivery conveyor.....	1220
Ribbon stock to rolls.....	680
Wash conveyor.....	380
Top tank merry-go-round.....	320
Ribbon conveyor .....	180
Delivery to first test.....	108
Delivery from second test.....	86
First test to sidewall solder-off.	60
Overhead core frame return....	60
Core makeup conveyor.....	58
Tank and core assembly.....	40
Sidewall solder-off .....	40
Belt conveyor, tank parts.....	140
<b>Total .....</b>	<b>5630</b>

The oven is heated by three burners in the lower section and one in the upper portion, using butane gas at the rate of 1,000,000 B.t.u. per hour. About 15,000 gallons of butane, which is liquid under pressure, are held in a storage tank outside the building proper.

Malleable castings to be attached to the radiator tanks for inlet and outlet fittings are received from an outside supplier. They are pickled, washed, rinsed, fluxed, dipped into solder kettle and then placed in a spinner to remove excess solder. Some must be drilled and tapped, or pierced for rivets, before assembly to tanks.

From this brief review of essential operations, the prominent part

played by chain conveyors, with hooks, carriers, trays and other types of transporting means, in the manufacturing operations is apparent.

As a matter of fact, the only movement of material not handled by such conveyors is the trucking of castings from the receiving dock and the transfer of sidewall strips from welding machines to assembly stations.

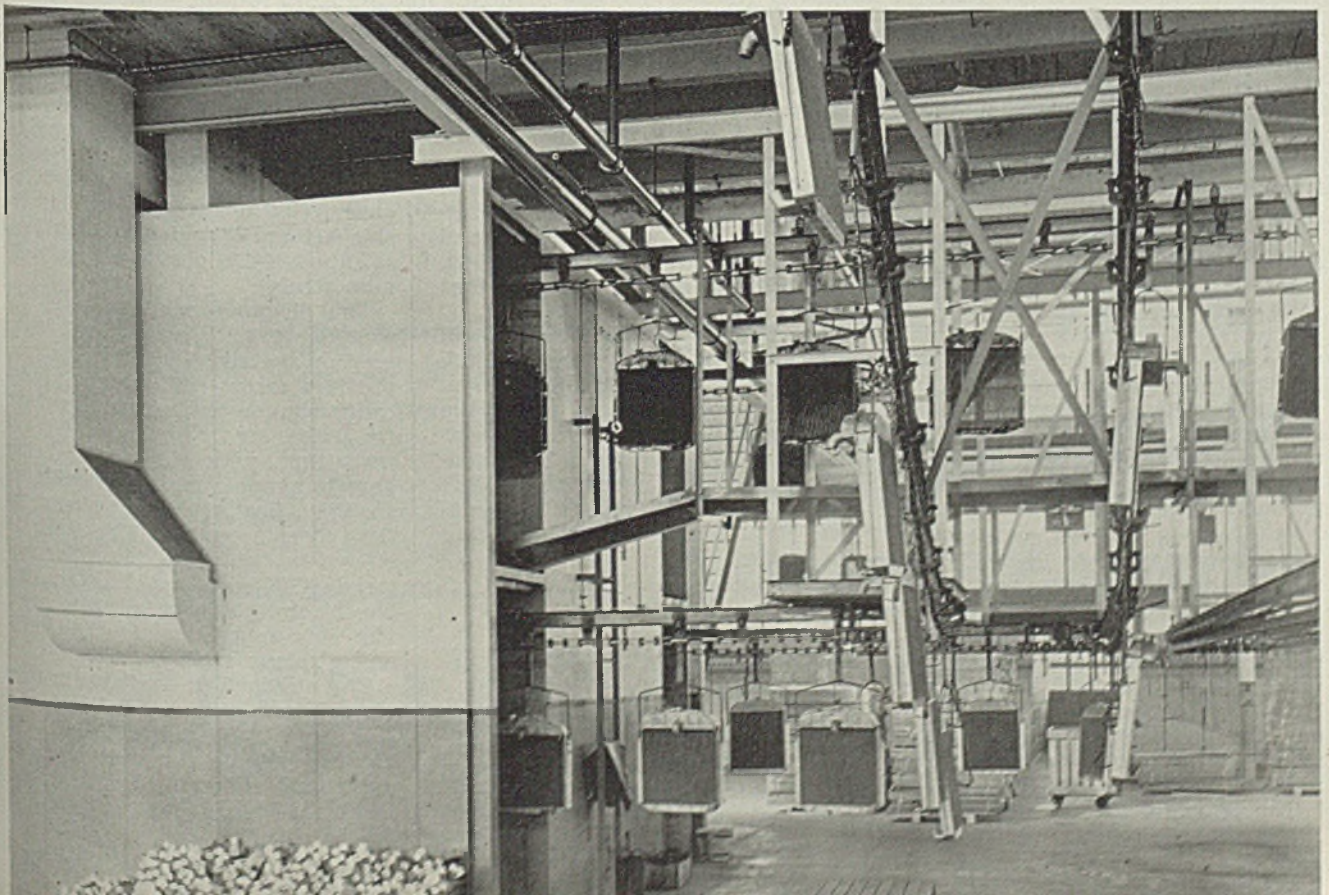
Raw material is received at the plant in railroad cars, a siding extending the full length of the plant inside and accommodating 13 cars. An outside siding will handle seven more cars.

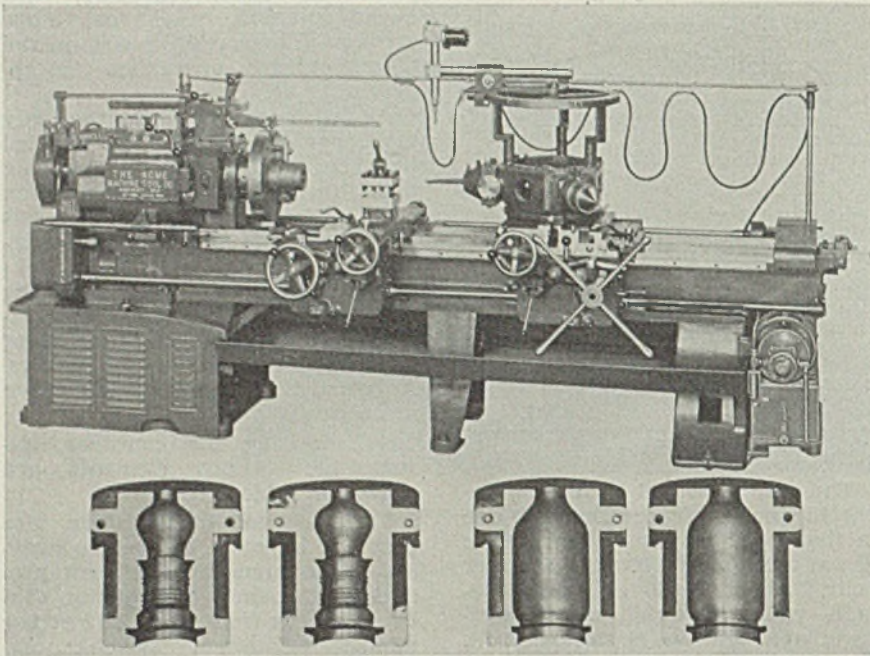
Summarizing the conveyor system, the various elements are shown in Table I.

Variable-speed drive units are provided on most of these conveyors to accommodate different production demands and giving conveyor speeds from 10 to 32 feet per minute. Conveyor systems and plant arrangement were developed by Mechanical Handling Systems Inc., Detroit.

Steam requirements of the plant are supplied from a separate boiler house with two 250-horsepower oil-fired Wickes boilers, operating at 100 pounds pressure at the boiler, reduced to 50 pounds in the plant. Mainly used for heat, steam also is required for pickling kettles, test tanks and for miscellaneous steam cleaning operations.

Double-deck bake oven, butane fired. Lower section is used to dry radiators before painting and upper level to bake paint after spraying





Above, control unit mounted on Acme turret lathe for production manufacture of glass bottle molds. Pictures at right (below) are of molds prior to polishing and show absence of ridges. Intricate shape at left was used to test duplicating control accuracy

## Glass Bottle Mold Production Stepped Up by Contour Boring

■ ABSOLUTE symmetry of mold halves and marked reduction in polishing time are results of a new method of making cast iron molds for glass bottles in the plant of a bottle manufacturer. Contour boring on a standard turret lathe equipped with a standard duplicating attachment to provide automatic control is currently producing more mold halves than previous methods.

The control mechanism, manufactured by Detroit Universal Duplicator Co., 217 St. Aubin street, Detroit, actuates the cross slide of the turret of a standard Acme turret lathe to move the boring bar in conformity with a metal outline template which conforms to the shape of the finished mold. This is accomplished with such accuracy that considerable savings in actual production time are realized.

In operation, the two mold halves are clamped together in the lathe by a special chucking device. After facing one end, the operator moves the turret-mounted boring bar up to starting position and then starts the duplicating control mechanism. Upon completion of the internal cut, the work is removed and reversed in the lathe to complete the mold by facing the opposite end.

The template for contour boring

is mounted on the head of the lathe, and the tracer head on the turret. The tracing finger follows the template and transmits a series of interrupted electric impulses to the control unit which, in turn, actuates the cross feed of the boring bar in exact conformity with the template.

In order to assure close conformity of the work with the template, a solenoid actuated clutch, operating from the tracer head, and mounted on the cross slide feed, provides fine control for the feed of the cutting bar.

An example of the close control possible with the solenoid clutch is shown at left in the illustration. This mold was run to prove the accuracy of the setup before acceptance by the purchaser. The accuracy of control provided by the clutch permits stopping the operation at any time without gouging the work.

### Economic Life and Government Control

■ *Government and Economic Life, Vol. II*, by Leverett S. Lyon and Victor Abramson; cloth, 1301 pages, 6 x 9 inches; published by Brookings Institution, Washington, for \$3.50.

In this study the two volumes

are a single unit. Volume I was reviewed in *STEEL*, Dec. 11, 1939, page 66. The first volume dealt with governmental implementation and regulation of private enterprise as it had been applied generally to a wide range of industrial and commercial life, without important distinctions between one type of industry and another.

This volume begins with a further analysis of a type in striking contrast to that in volume I. The relationships here considered are those in which limited areas of economic life or limited time periods have been singled out for special governmental treatment. Objectives sought, method used and administrative and enforcement devices employed in the special treatment of private enterprise differ greatly from case to case.

In the second part of this volume the government is considered as an actual producer of final goods and services, in some cases involved directly in all phases of allocation, conversion and distribution. In other cases it involves only distribution of privately produced commodities or controlled private production by subsidies, tariffs and loans.

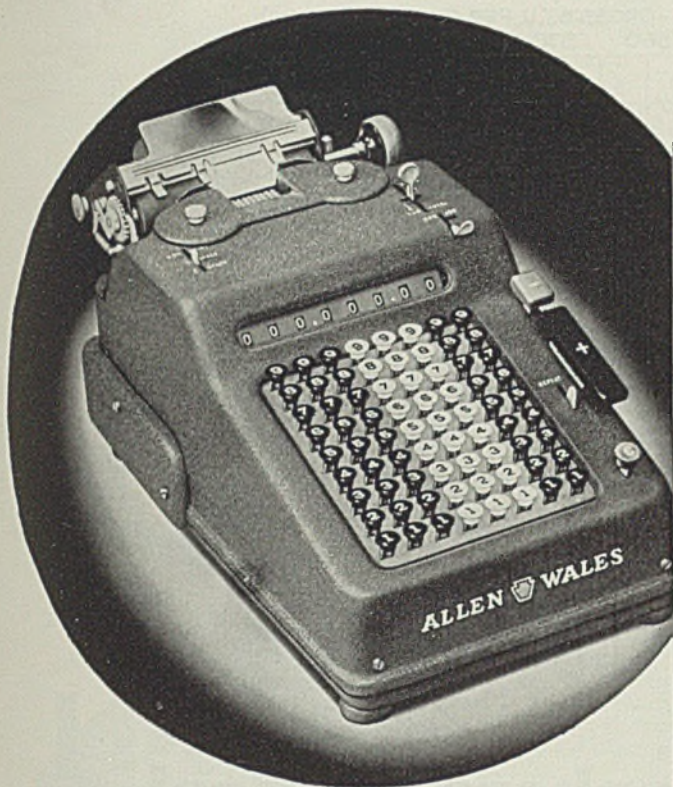
An analysis is presented of the special treatment of private enterprise, under two major headings—first, special treatment of individual industries, and, second, exercise of special controls on certain specific occasions.

### Electrode Widens Use Of Welding in Aircraft

■ Prompted by the necessity for fast production in national defense, Lincoln Electric Co., 12818 Coit road, Cleveland, has developed a new Planeweld electrode for welding engine mounts and landing gear forks in aircraft. It is of the shielded arc type for welding SAE 4130 and X4130 chromium molybdenum steels.

The electrode may be used for welding in all positions and when used on the above mentioned steels, provides metal with physical properties similar to the metal welded. Its welds are smooth without undercutting, with the spatter being kept to a minimum. The welds respond to heat treatment similar to the parent metal. Planeweld is offered in two types, No. 1 for material 0.120-inch and heavier, and No. 2 for light gage airplane parts (up to approximately 7/64-inch) and airplane tubing.

The electrode is available in four sizes: No. 1 in 1/8 and 5/32-inch and No. 2 in 1/16 and 3/32-inch. It also is suitable for welding fuselages, tail supports, torque tubes, bomb mountings, etc.



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Orthosil—the original Pennsalt Cleaner—quickly made an important place for itself in heavy duty metal cleaning throughout industry generally. Companion cleaners, meeting every need with laboratory precision, have been developed for varied and extreme requirements. The entire line is known today as the Pennsalt Cleaners.

They all have unusual dissolving and emulsifying action, and enormous lasting power. Their action is fast and efficient. Why not let one or more of them start saving money in your processes? Write Dept. E and we will gladly supply full details. Pennsalt Cleaner Division, Pennsylvania Salt Mfg. Co., Phila., Pa.



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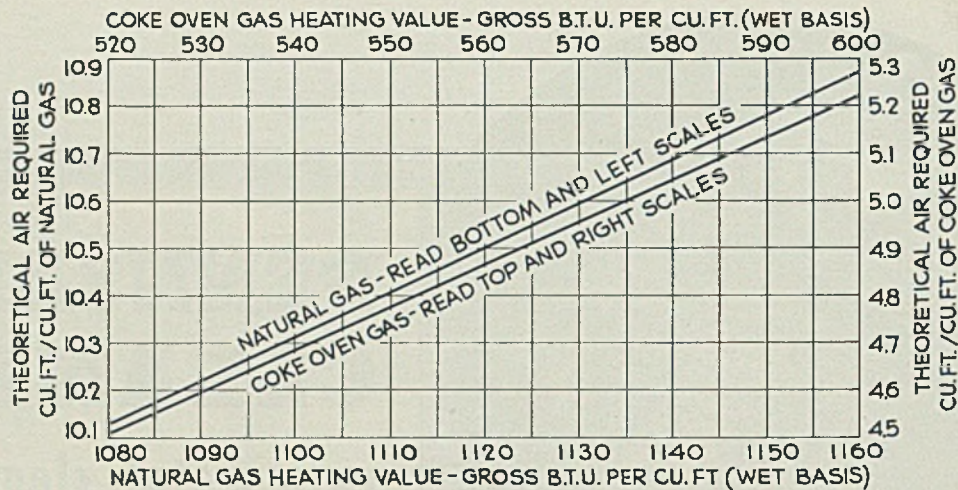


Fig. 1—Relation between heating value and theoretical air required for complete combustion of natural and coke oven gases

## Some Light on . . . . . Furnace Atmosphere Control

*Merely controlling air-gas ratio does not assure uniform composition of products of partial combustion of fuel gas . . . nonoxidizing atmosphere is obtained only by balancing free oxygen, carbon monoxide, carbon dioxide, hydrogen and water vapor*



■ SINCE heat-treating furnaces are employed for some type of work in practically every metal fabricating plant, control of furnace atmospheres is a subject of extremely wide general interest. Because partial combustion of fuel gas—burning gas with a deficiency of combustion air—is depended on to provide the desired furnace atmosphere in so many furnaces, the American Gas association through its committee on industrial gas research has made detailed studies of the factors affecting the composition of the furnace atmosphere in such work. Many facts not generally appreciated are brought to light.

For example, in an attempt to control the chemical effect of a furnace atmosphere on the material being heated, often a procedure previously used with success is duplicated but without obtaining the desired results. The reason lies in the fact that furnaces generally are op-

erated at a specified air-gas ratio without proper regard to composition of the fuel being burned at the time. The term "air-gas ratio" really does not embody sufficient information as it is also necessary to relate it to the theoretical air-gas ratio for the gas used or to know what percentage of the theoretical air requirements is being supplied at the time.

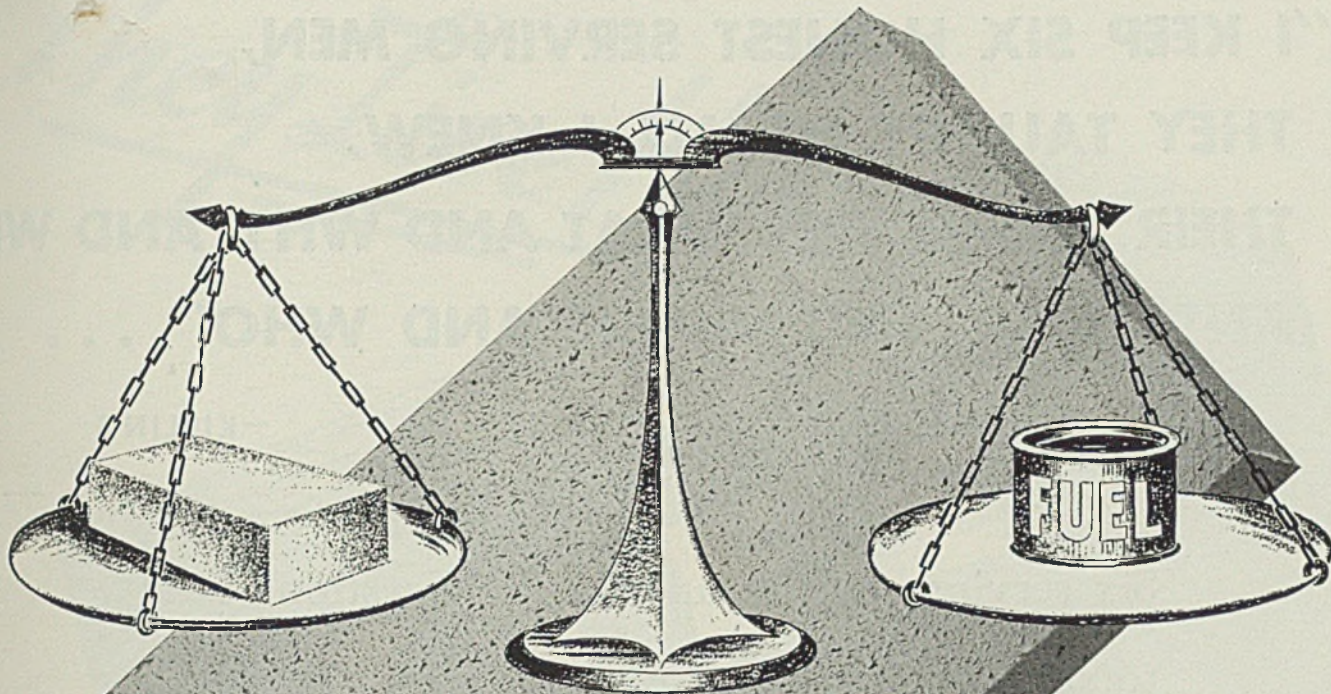
To show the importance of this particular factor, Fig. 1 reveals a relation between heating value and theoretical air required for complete combustion of natural and coke oven gases. Note that a natural gas with a heating value of 1100 B.t.u. per cubic foot theoretically requires 10.32 cubic feet of air for each cubic foot of gas. If burned with an air-gas ratio of 10.40, excess air would be present and an oxidizing atmosphere would result. At a later date however, the gas supplied might easily have a heating value of 1120 B.t.u. per cubic foot—a reasonable variation. Now if the previous air-

gas ratio were maintained, the flue products would be reducing in nature since theoretical air requirements are 10.50 cubic feet of air for that B.t.u. content.

This brings up another important factor which affects the nature of the furnace atmosphere—composition of the fuel gas burned—since both heating value and theoretical air-gas ratio required are fixed by this factor. Thus variations such as easily occur in the constituents of coke-oven gas also affect the heating value, thus changing the theoretical air-gas ratio required for complete combustion and so may easily produce a change from oxidizing to reducing atmosphere or vice versa.

It is evident that composition of flue products resulting from partial combustion of gas is influenced by a large number of variables, many of which are so interrelated that it is extremely difficult to determine the effect on composition directly attributable to any one. A relationship was discovered between flue





# Lighter Weight

# Less Fuel

There is one simple guide to the ability of an insulating firebrick to effect maximum fuel savings in an industrial furnace—weight. The lighter the weight the less fuel will be burned; the greater the weight the greater the fuel consumption. This is because insulating value and heat-storage capacity, which affect fuel consumption, are related to weight.

In their respective temperature ranges B&W Insulating Firebrick are the lightest in weight—hence represent the greatest potential fuel savings. The K-16, weighing but 1.1 lb. per 9-inch straight, is over 90 per cent air in the form of tiny, uniformly distributed cells. Others in the B&W series have similarly low weight and corresponding high index of fuel savings.

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### **B&W INSULATING CONCRETE**

B&W Concrete Mix is a light-weight castable with high insulating qualities and strength. It is ideal for cast or rammed furnace foundations, car top insulation, door linings, and similar uses, either exposed to furnace gases or as backing-up insulation. It may be reinforced in the same manner as ordinary concrete.

Two grades are available: B&W K-20 for 2000 F operating temperature and B&W K-22 for 2200 F.

**"I KEEP SIX HONEST SERVING MEN,  
THEY TAUGHT ME ALL I KNEW.  
THEIR NAMES ARE WHAT AND WHY AND WHEN  
AND HOW AND WHERE AND WHO" . . . .**

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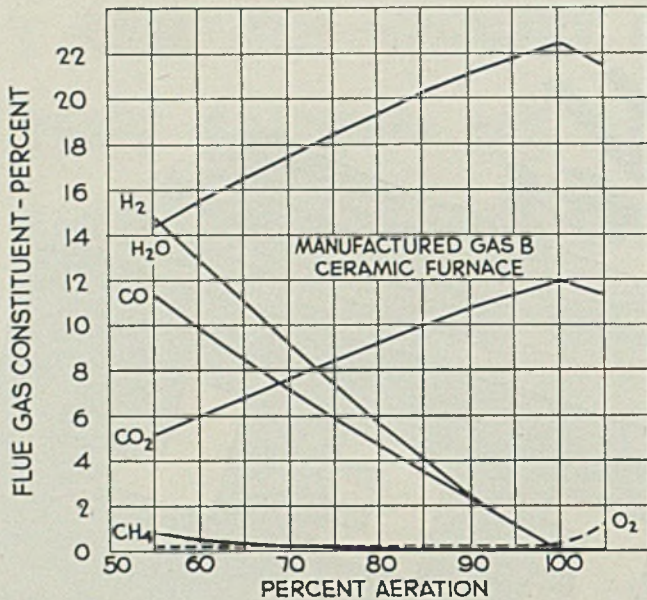
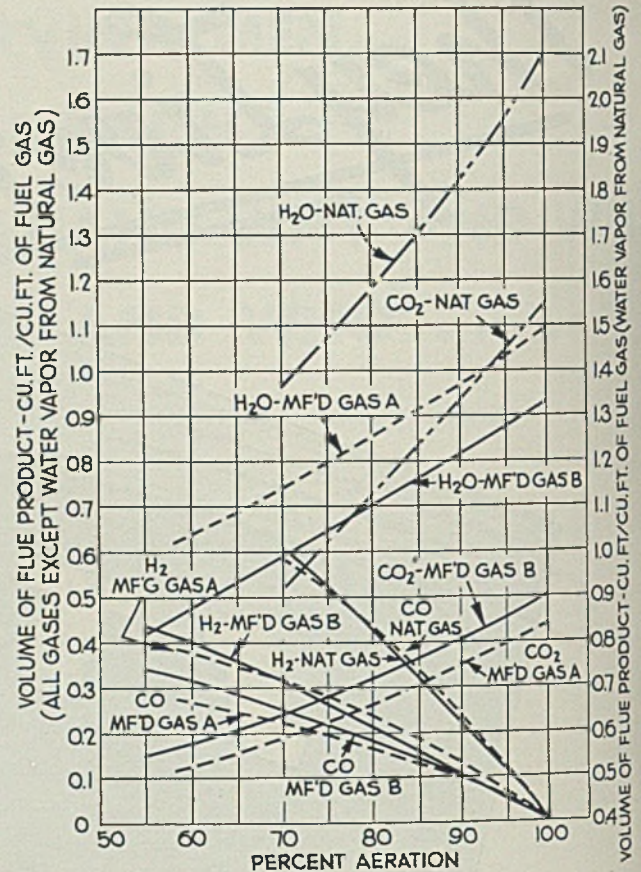


Fig. 2. (Above)—Flue products resulting from combustion of manufactured gas with a limited air supply. Minimum free oxygen occurs at 95 to 97 per cent aeration

Fig. 3. (Right)—Here is shown how volumes of individual flue gas constituents resulting from combustion of a single cubic foot of natural or manufactured gas vary with amount of air supplied



gas composition and fuel gas composition. Now it is possible to predict with reasonable accuracy the composition of flue products which will result when a fuel of known composition is burned with a given amount of air. This relationship shows that the total combined carbon in the fuel is proportionately distributed between carbon monoxide and carbon dioxide in the flue products at any given aeration. Total hydrogen (free or combined) in the fuel is similarly divided between water vapor and free hydrogen.

The American Gas association studies were made to determine effects on products of combustion of five variables — the amount of air supplied, fuel gas composition, the temperature of combustion chamber walls, temperature of flue products and cooling rate of flue gases. An attempt was made to isolate successively each variable so its effects could be studied independently. While close laboratory control approached this ideal condition, many characteristics are so interrelated as far as furnace performance is concerned that it is hardly possible to obtain complete isolation. Thus effects on products of combustion produced by different variables overlap to some extent.

Since elimination of free oxygen is essential in much heat treating and other furnace work, special attention was given to this element in the investigation. From Fig. 2, showing flue gas constituents in per cent resulting from burning a typi-

cal manufactured gas with limited air supply, note the lowest free oxygen concentration occurs at approximately 95 to 97 per cent aeration with this concentration increasing slightly as the aeration was decreased from that point. Combustion tube wall temperature apparently has no appreciable effect on the oxygen content of the flue gases, natural gas yielding the same percentage when burned in a water-cooled furnace as in the ceramic furnace. The manufactured gas gave the highest oxygen concentration — about 0.2 per cent — of any in the test.

#### Some Oxygen Always Present

It appears not possible to eliminate free oxygen entirely in the flue gases but the concentration can be held to an extremely low value by reducing the air supplied to 97 per cent aeration or lower. Since appreciable quantities of reducing constituents, carbon monoxide and hydrogen, are present in flue products at such aerations, any oxidizing effect of the free oxygen on materials being heated would be more than neutralized by the carbon monoxide and hydrogen.

Some interesting field experiences in this connection showed oxidation or scaling of metals heated in atmospheres from combusting gas at 97 per cent aeration or lower probably occurred from the oxidizing effect of water rather than the small concen-

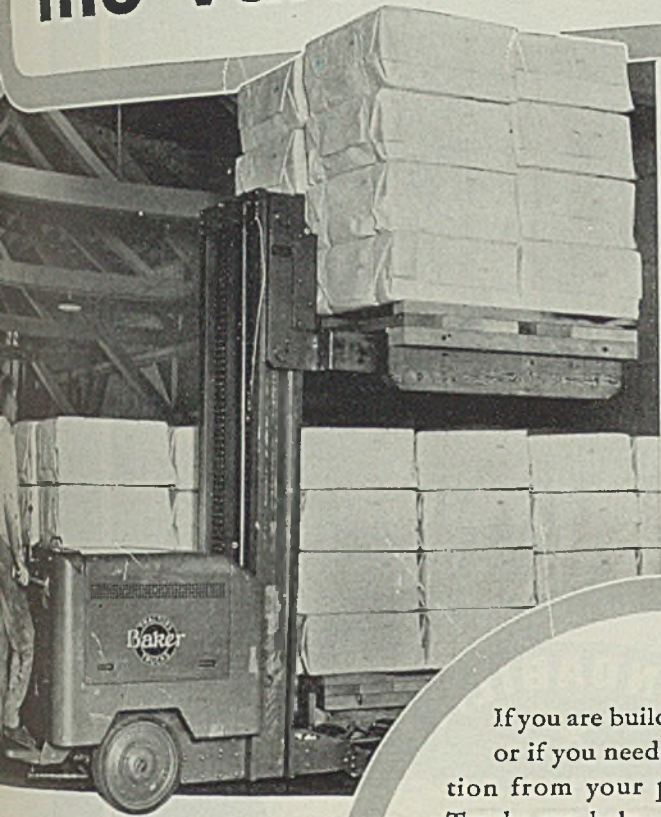
tration of free oxygen present.

For all practical purposes, oxygen may be considered eliminated from flue products at less than 97 per cent aeration. However, special attention must be directed to investigating methods for removal of water vapor for best results. Carbon dioxide also has an oxidizing effect on some materials, and its effect may be more important than that of small amounts of free oxygen.

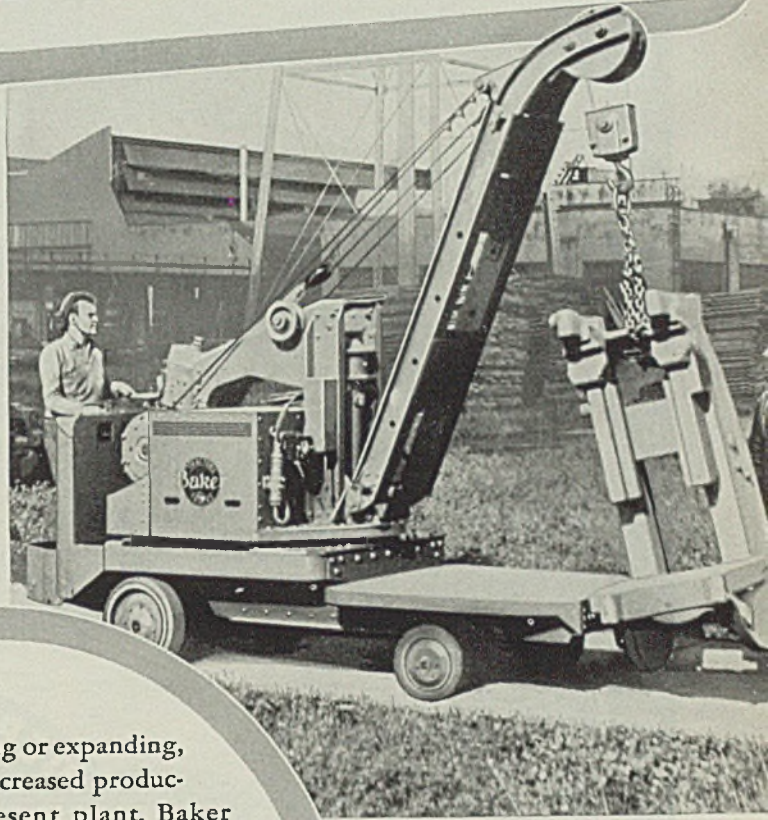
Fig. 3 shows how volumes of individual flue gas constituents vary with per cent of air supplied and also how they vary widely with different types of gas. This emphasizes what was said before—that the composition of the gas is extremely important and even slight variations may upset the reaction of the furnace atmosphere on the work.

It is recommended that anyone wishing to study this subject in detail obtain a copy of the complete report known as bulletin No. 11, project No. 36, published by the committee on industrial gas research, from the American Gas association testing laboratories, 1032 East Sixty-second street, Cleveland. In this publication is presented a complete correlation of data from detailed studies of the effects of each variable on volume and content of products of combustion. A number of flue-loss charts are presented and a chapter is devoted to practical aspects of gas combustion under reducing conditions. Price is \$1.25 per copy.

# BAKER TRUCKS Multiply the Value of Plant Floor Space



Two- or three-high tiering with Baker Lift Trucks doubles or triples the value of storage floor space, making additional plant space available for production.



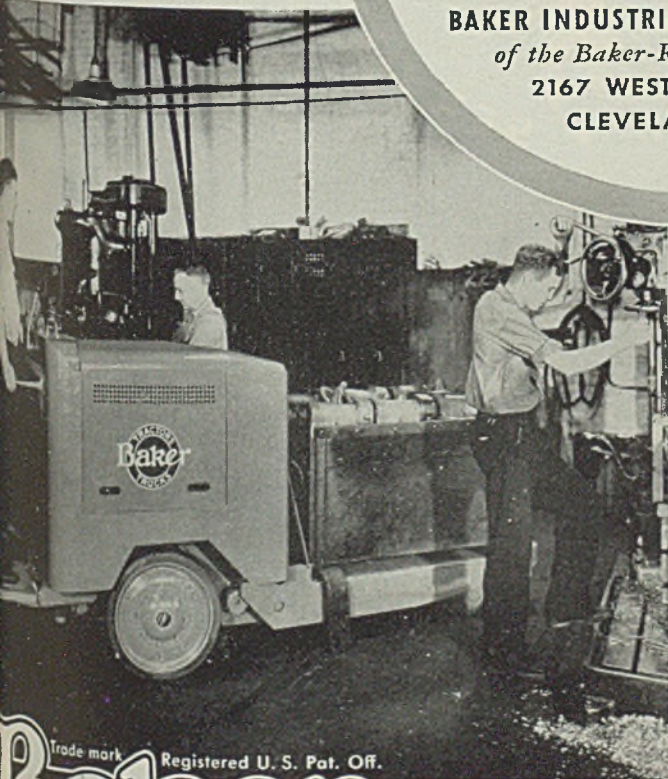
Baker Crane Trucks store heavy pieces in idle yard space, freeing inside floor space for production. One hundred feet is as near as ten feet with a Baker Truck.

No cluttered aisles or production jams in this plant, where Baker Elevating Trucks bring the work right up to the machine, and take it away when finished.

If you are building or expanding, or if you need increased production from your present plant, Baker Trucks can help you make the most of your floor space. Here are four typical cases, taken from hundreds in our files, where this has been done... Baker offers the services of a material handling expert to work with you toward reduced overhead and greater production efficiency.

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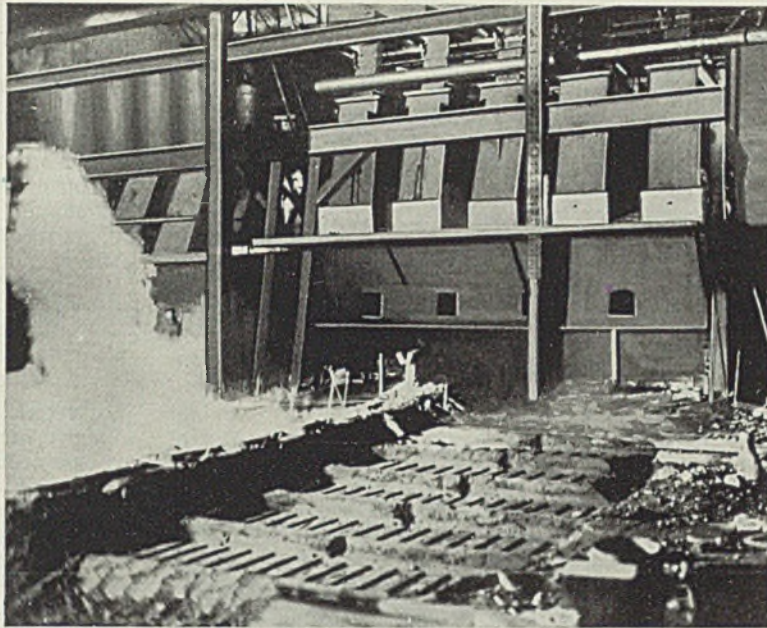


Fig. 5—Electric furnace having four electrodes suspended between five charging stacks and originally operated by the Noble Electric Steel Co., Heroult, Calif. The furnace tapped every eight hours and made 11 tons per day



## Electric Furnace Iron

By CHARLES HART  
President  
Delaware River Steel Co.  
Chester, Pa.

### Part II

*Comparison of many types of electric furnaces employed in other countries for smelting iron ores indicates that electric energy from Bonneville dam will find best use in ferroalloy production. Power rates make new project appear commercially profitable*

■ SWEDEN was the leader in electric smelting, and the furnaces as designed met conditions as they existed at the time the art was introduced. Norway was forced to meet existing conditions and turned to the pit-type furnace.

For general use and for world-wide conditions, the Spigerverks furnace has the following advantages: (1) lateral filling, which increases the life of the furnace; (2) higher voltages, which make possible increased production; (3) higher temperatures, which permit better sulphur removal; (4) use of low-grade fuels, which materially reduces costs; (5) closed type in design, absolutely explosion proof; (6) the fur-

nace acts as a "metal mixer" as well as an "electric accumulator." These advantages give the Spigerverks furnace the call in practically all new installations, which have included two recently erected in Sweden. In spite of the great improvement manifest in these two types of electric furnaces, world production of electric pig iron is relatively small and is confined entirely to European countries. The average annual output for 1935 and 1936 was 205,517 gross tons, or less than 0.25 per cent of the world total for the same period.

Sweden. — In 1937, 58,810 gross tons<sup>†</sup> of electric pig iron was produced, or 36.4 gross tons average

per day for six furnaces using current in connection with charcoal. The electric current consumption was approximately 2400 kilowatt hour per ton of product. These furnaces operated at an average of 243 days for the year, as compared with an average of 281 days for the 39 charcoal furnaces, which produced an average of 28.6 tons per day. The output of nonelectric iron was about evenly divided as between coke and charcoal iron, made in ordinary blast furnaces.<sup>10</sup> The coke furnaces produced a daily average make of 130 gross tons.<sup>10</sup>

The rate for electric power in Sweden<sup>1</sup> was 3.5 mills per kilowatt-hour at the customers' transformers, subject to a rebate of 10 per cent to the electric smelters. In addition to this rebate, seasonal power was furnished at reduced rates, depending upon the number of months the furnaces operated during the year. These rates ranged from 0.63-mill

<sup>†</sup>References were presented at end of first installment last week.

for one month to 3.15 mills for the entire year. This schedule of rates would indicate that for 1937 the average rate paid on the 2400 kilowatt hours consumed per ton of iron was 1.89 mills. In that year charcoal sold at about \$12.50 per net ton. Sweden's charcoal consumption in blast-furnace practice is placed at 1350 pounds per ton of iron, which indicates a fuel cost of \$8.44 per ton. Table 1\* indicates a possible fuel cost of \$11.49 per ton on electric pig iron, assuming continuous operation throughout the year. The figures are based upon the use of agglomerated ores in the charcoal furnaces as well as in the electric furnaces.

#### Output Is Not Large

The total annual capacity of electric smelting furnaces in Sweden may be placed at 100,000 gross tons. Sweden is credited with a total potential waterpower capable of producing 32,500,000,000 kilowatt hours per year. Only 5,500,000,000 kilowatt hours are now available, which represents only one-sixth of the possible electric energy. Viewed in this light and in conjunction with the increased costs for charcoal due to diversion of lumber products to more remunerative markets, it would seem that the electric smelting of iron ores has not been the bonanza prophesied for it at the time of the introduction of the art. Sweden, however, should be credited with being the initiator of this unique method of iron metallurgy.

*Norway.*<sup>10</sup>—Norway, for the same period, 1935 and 1936, had an average annual output of 33,497 gross tons of pig iron. Of this tonnage, 32,068 gross tons, or 92.7 per cent, was produced by the electric method with the use of low-priced and inferior coke and coke breeze. This fact emphasizes the adequacy of the pit-type furnace for Norway's requirements.

The cost of power is said to be about 1 to 1.5 mills per kilowatt-hour. This cost of power has attracted ferroalloy manufacturers, to the end that 145,000 tons of these products were produced in the year 1937. In the same year 32,000 gross tons of electric pig iron was produced. The operation consumed an average of 2550 kilowatt-hours and 893 pounds of coke and coke breeze per ton of product.<sup>10</sup> In addition, 4000 tons of iron was produced as a by-product in an aluminum plant operated by the Pederson process.

*France.*—Only meager information is obtainable as to the types of electric furnaces used in France for the production of pig iron. It is intimated that much of this iron is synthetic in nature, and the indus-

try depends largely on scrap and ore as the materials to be smelted. For 1935 and 1936, the average annual output is placed at 53,645 gross tons, or 0.9 per cent of the country's entire production for the period. The power cost is placed at 2 mills per kilowatt-hour, and is known as "white coal."

*Italy.*—An interest in electric smelting in Italy may be attributed to the fact that there is a woeful lack of good coking coal, as well as that 30 per cent of the iron-bearing materials as offered to the smelters consists of agglomerated py-

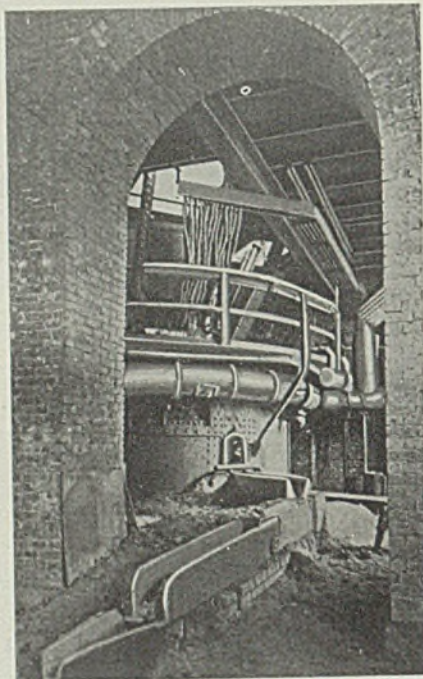


Fig. 6—Gronwall electric furnace located at Trollhatten, Sweden

ritic residues. The pit-type furnace is highly appreciated because of the high temperatures obtainable, whereby it is easy to reduce the 0.50 per cent sulphur found in this material to 0.03 per cent in the pig iron. These facts account for the production of 62,567 gross tons of electric pig iron, from this material, in low-shaft furnaces. Italy produced a greater tonnage of electric pig iron than any other country engaged in this industry during the periods under discussion.

*Finland.*—A Spigerverks furnace (Fig. 3) of the latest design was installed at Imatra, Finland, early in 1938. It has an intake of 12,000 kilovolt amperes and at a 0.90 load factor is capable of producing 30,000 tons per year. Here again agglomerated pyritic residues or "blue billy" is smelted, and the resultant iron is sold under a guarantee of 0.020 per cent phosphorus and 0.01 per cent sulphur maximum. This furnace was abundantly satisfactory and represented the last word in

the Ivar Hole design. It fulfills the requirements as to being a metal mixer and electric accumulator. This is confirmed by Fig. 3, which shows the elevation of the electrode tip in reference to the furnace bottom, whereby an entire day's run of iron may be stored in the hearth, and tapped out in fractional casts. This furnace plant, if still in existence, is now under Russian domination, as Imatra is within territory ceded to that nation by a recent treaty.

#### North America

In regard to smelting ore in the western hemisphere, complete failure has occurred in every cast. The causes for failure are apparent in each instance and may be attributed to improper furnace designs or to commercial troubles, which developed later.

*Canada.*—The fact that electric current was available in parts of Canada at rates varying between \$4.50 and \$6.00 per horsepower-year led to an interest in the art of electric smelting. Dr. Heroult introduced the direct-heating arc furnace, which consisted of a circular steel tank properly lined. One carbon electrode was included in the bottom and the other was suspended from above. The furnace was unenclosed. This electrode suspension led to troubles that were insurmountable and the furnace was abandoned. Haanel tried to obviate these difficulties, and a double furnace was built in which the electrode was more firmly set in place and did not contact the raw materials until they more nearly approached the hearth. Turnbull brought forward his complicated direct-heating furnace with six electrodes. This furnace also had a rotating nodulizing kiln attached. All these types were failures, although some electric pig iron was produced during the World war and 27,000 gross tons were produced as late as 1918. This operation was carried on in steelmaking furnaces by using steel scrap, and the product was a "synthetic" pig iron.

*California.*—In 1906 Dr. Heroult transferred to Shasta county, Calif. He still clung to the direct-heating arc principle but increased the electrodes to three in number. The closed furnace included five charging stacks, Fig. 5, around which the escaping gases were burned. This furnace was guaranteed to make 20 tons per day. It was blown in July 4, 1907 and proved to be a failure in every way. Dr. Dorsey Lyon, after due experimentation, designed a high-shaft furnace essentially the same as the early Electrometals furnace, of which the modern furnace (Fig. 1) is the outgrowth. The gases were not recycled but were burned in the fur-

\*Presented in last week's issue.



nace top with air introduced through tuyeres inserted just above the stock line. This furnace operated from 1909 until 1911. The next effort in California was the Noble furnace, designed by Dr. Frickey. A second and larger furnace of the same design was erected in 1913. In principle these two furnaces followed the lines shown in Fig. 4, and the fuel consisted of 60 per cent coke and 40 per cent charcoal, both of inferior quality. These three furnaces completed efforts at Heroult on the pit. All ended in commercial disaster, no doubt largely because of a rise in the power rate from \$12.50 to \$25.00 per horsepower-year.

In 1918 another pit-type furnace was built in Shasta county with an input of 1400 kilowatts, and an effort was made to smelt the same ores previously used. Inasmuch as the costs were \$27.19 at the furnace without overhead, this attempt also ended in failure—and with it electric smelting in California ceased.

*British Columbia.*—The efforts in Canada and California cover the actual attempts at the commercial smelting of iron ores in North America, although Dr. Stansfield prepared a report for British Columbia that indicated a cost of \$29.75 per gross ton in that province, with electric current delivered at \$15.00 per horsepower-year.

#### South America

One effort was made in Brazil, which depended upon seasonal power, a condition resulting from the use of the current by the "coffee hullers" during the summer months. This plant consisted of two Electrometalls furnaces, each capable of producing 30 gross tons per day, in conjunction with two 6-ton converters with adequate rolling-mill capacity. An electric-steel furnace was also included, and may be looked upon as a curer of ills arising from conditions existing at the plant. This company failed in 1929—a failure attributed to the "petering" of the ore supply. This seems anomalous in a country as rich as Brazil is known to be in iron reserves, and other ores were available with a haul of less than 600 miles.

#### Electric Smelting in U. S.

The situation now is different from that which obtained at the time of the attempts made in California, owing to the expansion of water power by the government. It has been stated that with the completion of the government projects, an annual output of 100,000,000,000 kilowatt-hours per year will be available in addition to commercial power, which as of today stands at 107,000,000,000 kilowatt-hours per

year. The government dams have four distinct aims—power, navigation, flood control and irrigation. These projects, except the Tennessee Valley Authority, are found west of the Mississippi river, and more particularly in the Pacific states.

Some interest in the Tennessee Valley Authority power for electric smelting of iron ore has been shown. These power plants are credited with a cost of 1.70 mills per kilowatt-hour.

The Bonneville dam, in the Columbia river area near Portland, Oreg., is receiving the greatest attention in reference to iron smelting. When completed with generators installed, the Grand Coulee dam will provide

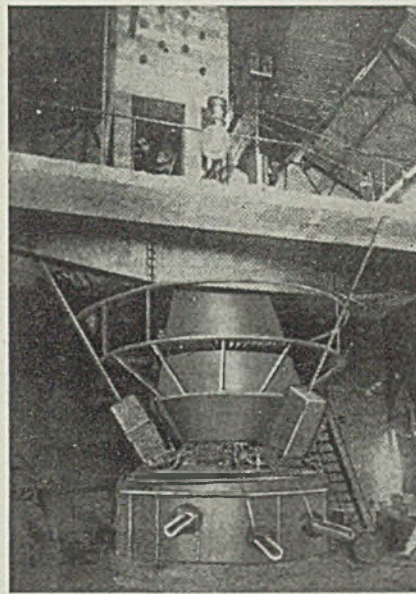


Fig. 7—Heroult-type furnace of 1500 kilowatts which was first operated in 1909 at the plant of the Noble Electric Steel Co., Heroult, Calif.

a total capacity of 1,890,000 kilowatts. Including the 518,400 kilowatts at Bonneville, the available power will thus amount to about 2,400,000 kilowatts now installed and under construction. The Columbia river when ultimately harnessed will have a total of 8,000,000 kilowatts at 10 dams, all of which have not yet been authorized. The Bonneville power is now available at \$17.50 per kilowatt-year, or 2 mills per kilowatt-hour at a 100 per cent load factor.

The smelting of iron ore with power from Bonneville dam was investigated by the war department, and Edwin T. Hodge<sup>12</sup> was employed to report on the raw materials available, and Raymond M. Miller<sup>13</sup> reported on the feasibility of the proposed operation. Last year Dr. Paul J. Raver<sup>14</sup> made a complete summary of the information contained in the two reports mentioned, and

it was published by the department of the interior.

*Ores.*—Among the ores favored by Hodge and Miller may be found the Scappoose ore of Washington, at an estimated price of 7½c, the Ship Mountain ore at 10c, and the Cave Canyon ore at 8.30c. Consideration is also given the El Tofo ore from Chile at 8.15c, and possibly the Las Trucas ore from Mexico at 7c per unit of iron delivered at Portland. Of these possible ores, based upon cost and quality, the last mentioned would be the most desirable if it were not for the fact that investments in Mexico are un dependable.

*Fuel.*—The fuel to be considered may be either coke, coal or charcoal. The coking coals of Pierce county, Washington, offer the best source for coking operations, and are obtainable at a price whereby a coke at a cost of \$5.90 per net ton is possible, when produced in by-product ovens under the most advantageous conditions. The ash content approaches 18 per cent. Sub-bituminous coal suitable for electric smelting use may be had at \$3.50 or less per ton delivered at Portland, while coking coals are available at prices ranging between \$4.00 and \$5.00. Charcoal, if found desirable for the purpose, would cost \$9.00 per net ton, unless the Ruzicka methods are workable, whereby a cost of \$4.00 per net ton is assumed. Limestone of excellent fluxing quality is available at \$2.80 per gross ton.

*Feasibility.*—The feasibility of electric smelting depends upon the assembly of these materials at the prices indicated, and used in conjunction with power at a price low enough to permit operation on a competitive basis. It is also evident that conversion of the materials considered above could not be done in a blast furnace on a basis competitive with iron produced on the Atlantic seaboard or at Birmingham, plus transportation to the Pacific coast competitive points.

#### Pig Iron or Finished Steel?

It would seem that this problem resolves itself into one of two alternatives, which are: (1) Should the project be restricted to the manufacture of pig iron only, or (2) should it produce pig iron for immediate conversion into steel and finished steel products?

*Pig Iron.*—As to pig iron, estimates have been made that indicate that with Scappoose ore and current at 1 mill per kilowatt-hour for seasonal power, No. 2 foundry iron could be produced for \$20.98 per gross ton.<sup>1</sup> This permits payment of 1.3 mills for firm power for a continuous operation throughout the full year. The 1-mill rate used applies to a 10-month opera-

tion. The 1.3-mills rate for a full year operation amounts to 72c per ton, which is sufficient to make up for the expense incurred on account of the two months idleness. It must also be considered that because of the abundance of power available at Portland any interruptions must come from the furnace operation. The idea, however, originates with the scale of rates in force in Sweden.

**Costs.**—Estimates of costs using El Tofo ore and electric power at the cost shown above indicate a cost of \$19.99 per gross ton of basic iron.

These costs are predicated on the use of the Spigerverks type of furnace, with Soderberg electrodes estimated at \$1.01 per ton of iron. A labor and supervision cost of \$2.66 is based upon 5 man-hours for labor alone per ton of iron, as compared with 0.5 man-hours in our modern blast-furnace practice. No credit is taken into account for the escaping gases, in that use for them is difficult to find.

#### New Type Furnace Contemplated

If the Norwegian furnace were used, the cost of foundry iron would be \$1.78 higher than the estimated cost and would be \$22.76. It is understood, however, that a furnace that as yet has not been used commercially will be perfected and placed in operation. An experimental furnace of this type is credited with a consumption of only 1000 kilowatt-hours per ton. In view of the fact that a definite quantity of energy is required to convert ore to pig iron, the difference in the electric operation must be made up of carbonaceous matter, and it is apparent that the final fuel consumption must be considerably higher than in present commercial furnaces, although the escaping gases partially preheat and prereduce the ore. The type of furnace permits the use of slack coal, but it would seem that, in view of the fact that electric smelting is being considered to consume as much electric current as possible in proportion to the carbon consumed, no merit can be ascribed to a furnace that minimizes this ratio.

After a careful study of all the factors in the matter of electric smelting, Miller<sup>1</sup> has this to say:

"Without the advantages of Bonneville power at the rates above given, the project is definitely not feasible, but with these power rates available it appears that there is some promise of a project being established on a commercially profitable basis."

**Integrated Steel Plant.**—The second choice, or an integrated steel plant, offers a more complex problem in that a plant to be successful must be of greater annual capacity than would be permissible in a plant

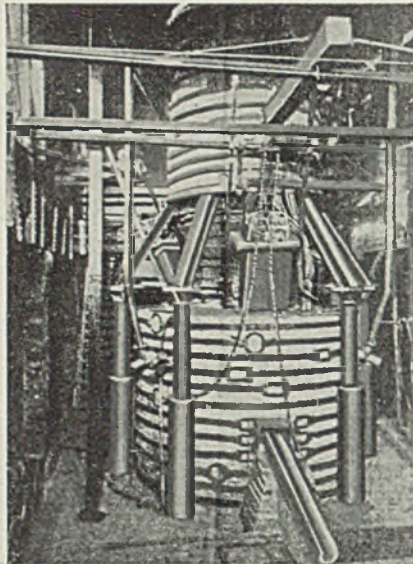


Fig. 8—Gronwall electric furnace at Domnarivjet, Sweden. The unit is 25 feet high and used electrodes 11 x 22 inches in cross section and 63 inches long

producing pig iron alone. On the other hand, the steel plant with its full complement of furnaces, coke ovens, steel-producing and steel-rolling units, would offer greater economy throughout, in which all the by-products would find use within the plant itself, and costs would be materially reduced. Such a plant would be ideal, in that with the exception of the steelmaking department, where tar, coke oven and furnace gases find their best use, all other operations would consume electric energy, and as a result maximum consumption of current would be maintained. Furthermore, it is essential that the finishing departments be relatively few in number and therefore be of sufficient size to warrant low costs. It is essential as well that these departments be equipped with mills of the most modern design. It is regrettable that time and space will not permit a complete analysis of the mechanics of such an installation, the beauty of which is apparent to all steel operators.

**Controlling Factors.**—The commercial phase of this proposition is far more important than the mechanical makeup of the plants projected, for, after all, profits are essential to the permanency of any undertaking. Competition in raw materials and competition in the sale of the finished products are the controlling factors. In the matter of raw materials, scrap is the outstanding factor for consideration, in that it is abundant and consequently the price fluctuates with current conditions. The present competing steel companies are credited with using 90 per cent of scrap

in the open-hearth mixtures, much of which is of their own making. The 10 per cent of pig iron required is produced in their own plants as well. It should be noted that the full benefit of pig iron in the mixture lies in its introduction as hot metal in sufficient quantities to reduce time of heat and fuel consumption. The disappearance of cold pig iron from the steel industry is regrettable, for even in the steel-producing centers such plants as may be without blast furnaces have been driven to the use of scrap in increasing proportions, which in extreme cases has brought about the complete elimination of pig iron from their mixture. This trend is reflected in the amount of iron ore consumed per ton of iron and steel products produced. In 1890 about 2.10 tons<sup>14</sup> of ore was required, as against an average of 0.96 tons<sup>14</sup> for the industry as it now operates.

It is evident that the electric furnace, in order that it may compete, must produce pig iron at a much lower cost than the competitive prices for pig iron delivered at Portland. All of which leads to the conclusion that the electric energy from the Bonneville dam will find its best uses in the production of ferroalloys and the smelting of some of the more valuable metallic ores, the lead in which has been taken by the aluminum industry, and rumors indicate a contract for 65,000 kilowatts for this purpose.

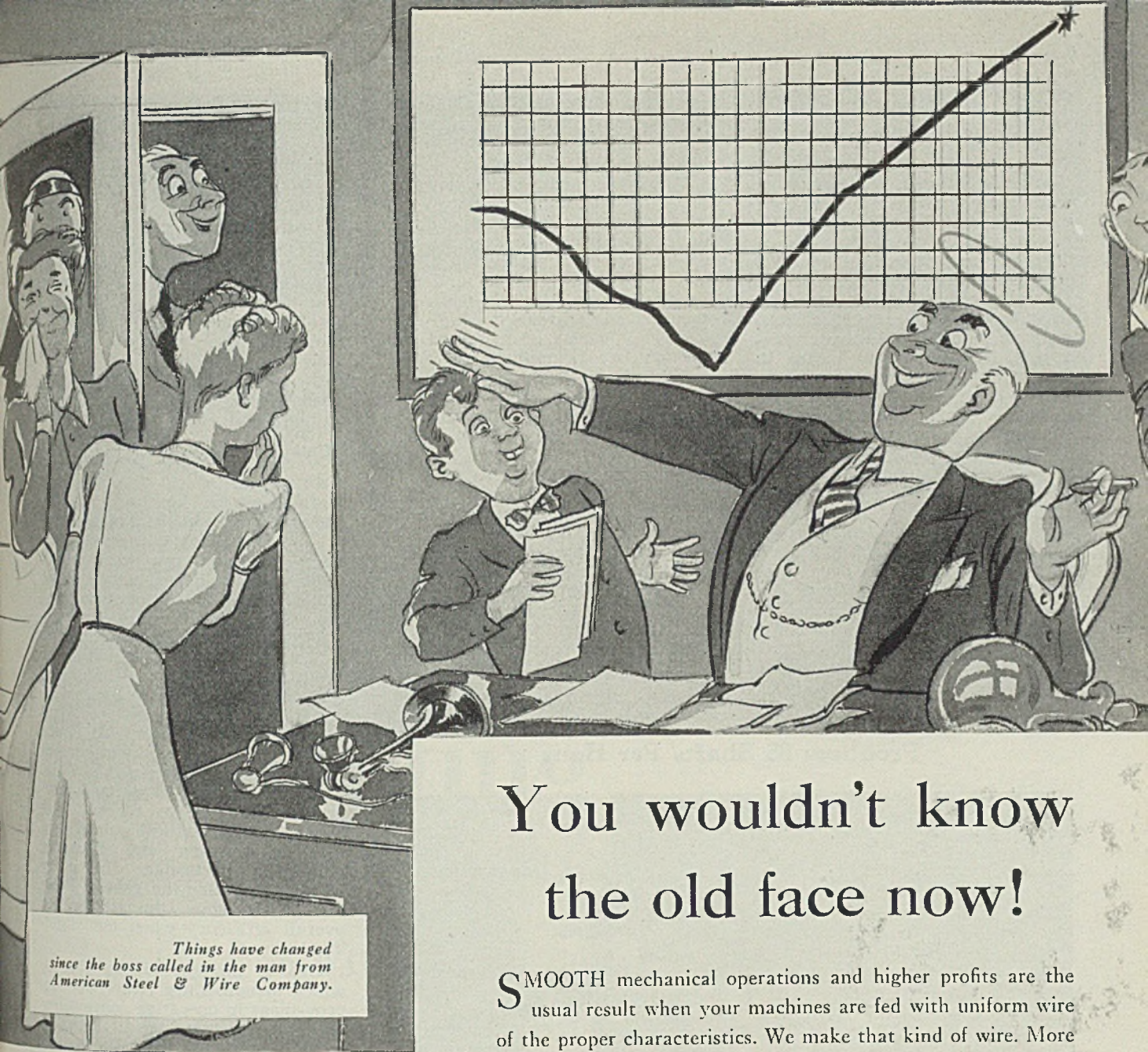
As to the possibilities of a steel plant, Dr. Paul J. Raver<sup>15</sup> has the following to say:

"It is concluded from a consideration of the problem that steel interests, adequately financed, could establish successfully a large integrated iron and steelworks and a tin plate mill in the Columbia river area, if a steady outlet for the tin plate could be assured; and further provided that the company could gain control of the most suitable and lowest cost iron ore, coking coal and limestone deposits available to the area.

#### New Cleaner Suitable For Steel and Brass

■ A new cleaner suitable for still tank work and recommended for cathodic cleaning of steel, brass and copper is announced by Metal Cleaner department of Cowles Detergent Co., 7016 Euclid avenue, Cleveland. Known as MC, it is a medium pH material of unique anionic balance, containing an effective detergent accelerator.

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## "Give them Light—"

(Concluded from Page 51)

Glareless, unvarying intensity on the order of 300 foot-candles on work-in-process (as compared to an average level of approximately 3 foot candles revealed by a survey of older manufacturing plants) is an important principle in the modern philosophy of "Better light—better sight" as it applies to the metal-working industry. General acceptance of this philosophy means the end of the "dark shop" tradition and with it the idea that night shifts are bound to be unduly fatiguing to workers, unduly hard on mechanical equipment, and unduly wasteful of time and materials.

Electrical power as a driving medium long has been accepted by management as one of the cheapest of all factors entering into successful mass production of metal products. Management no longer hesitates in replacing an outmoded machine tool requiring 20-horsepower, with a new model requiring 60-horsepower—because management

has been educated to evaluate the new machine in terms of increased profits which far outweigh its slightly increased power cost.

This same management, however, is all too apt to question sharply increased use of power when it shows up in terms of increased wattage on the meters of plant lighting circuits. Apparently some kind of a practical "yardstick" is needed to measure improved "seeing efficiency" in terms of increased production per hour for each added lighting kilowatt, just as increased machining efficiency is judged in terms of added pounds of chips removed per hour for each added driving horsepower.

Therefore, as the basis for such a test of seeing efficiency, there is suggested a comparison between the number of *acceptable* pieces per shift—preferably a night shift—which a good workman can get off a given machine under properly specified high-level illumination, and the number which this same workman can get off this same machine during the same shift un-

der conventional low-level shop illumination. In practically every case, the increased number of acceptable pieces per watt of increased lighting current will amply justify the increased meter reading.

To clinch the argument, management should check up with the good workman as to his personal reactions to the two levels of illumination. What he will tell should be of particular value from the employer-employee relations point-of-view—especially if there is any concern over the problem of keeping good workmen satisfied—especially on night shifts.

### Unit Lighting Equally Important

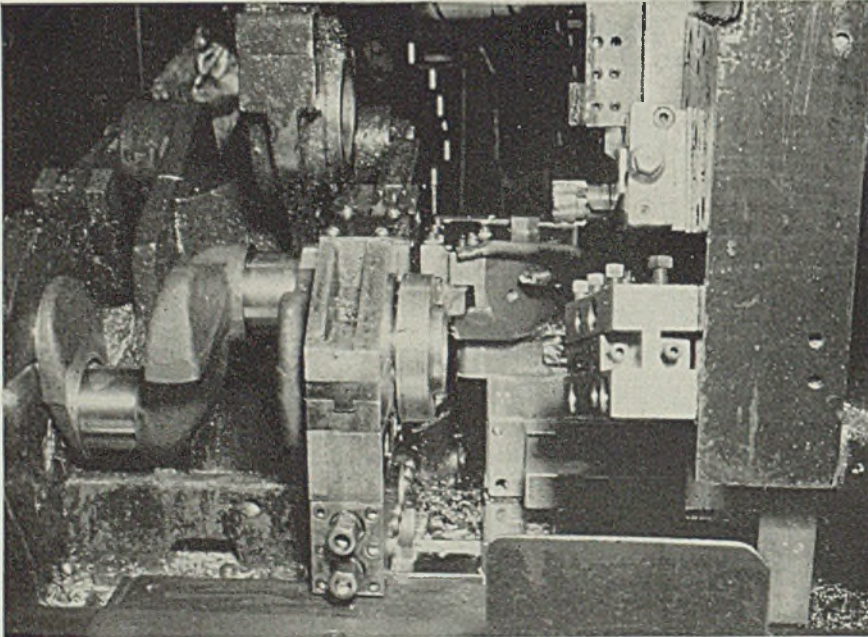
As may be indicated by the illustrations, space lighting was only one of the subjects in mind for discussion when this article was planned. The other was that of unit lighting facilities as built onto or built into certain modern machine tools—especially those of high precision variety. Please bear in mind that these unit lighting facilities are not presented as eliminating the need for adequate space illumination in a machine shop, any more than automobile head lamps eliminate the desirability of general illumination of arterial highways. The units merely supplement general illumination by concentrating added light at critical points in a machine—working and gaging points in particular. In other words, the better the general lighting of the shop, the greater the overall efficiency when unit lighting is used.

This is brought out by Fig. 3, which demonstrates clearly the improvement in operating convenience of a standard cylindrical grinding machine through the simple expedient of attaching to it on an adjustable arm a simple reflector-type lamp—this machine being located in the Nuttall gear works of the Westinghouse company in Pittsburgh—a plant wherein the general level of illumination is high.

This may seem such a simple expedient as hardly to deserve mention, but if the average shop be canvassed to determine where similar inexpensive unit lighting installations might profitably be made—the number found will surprise the investigator and lead to action which will eliminate a lot of eyestrain and spoiled work.

With all due respect to those who already have accomplished smart things in the way of unit and built-in lighting facilities in connection with machine tools, it is a fact that designers so far have barely scratched the surface in this big field of opportunity. Machine tool designers have gone infinitely further in the acceptance and ingenious building-in of complicated electrical

## Produces 25 Shafts Per Hour

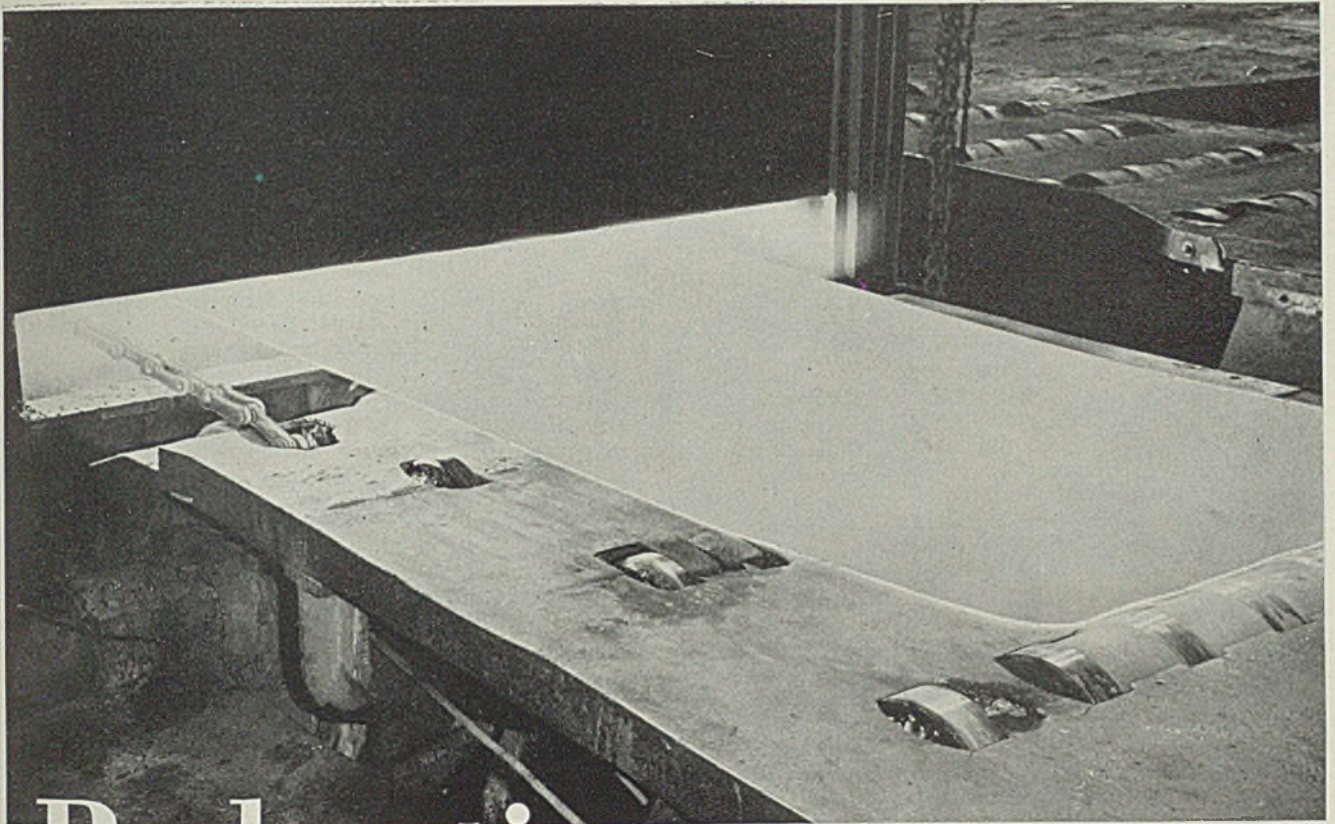


■ Electric chucking and use of cemented carbide tools are features of this Sundstrand lathe for turning the ends of crankshafts at the plant of a leading car producer. The lathe is provided with three tool posts, one a vertical and two on horizontal slides at the front and back of the machine.

The operation is completely automatic. The crankshaft is merely placed on the machine and removed by the operator when machining is completed. Machining consists of

boring and reaming the transmission pilot bearing hole, boring the retainer hole, facing the crankshaft flange, and end of pilot and turning the outside diameter of the flange and pilot, and finally, turn groove and chamfer.

Production is approximately 25 shafts per hour per machine. Approximately 600 pieces are obtained per tool grind—one grind for every 24 hours of machine operation. Photo courtesy of Carboloy Co. Inc., P. O. box, 239 P. Rk. A., Detroit.



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Cleveland, Ohio, E. F. Bond • Detroit, Mich., H. L. Sevin • Portland, Oregon, Barde Steel Co.  
Los Angeles, Calif., Ducommun Metals & Supply Co. • Montreal and Toronto, Canada, Drummond, McCall & Co., Ltd.

drive and control apparatus than they have with the relatively simple but effective lighting facilities which the electrical industry has developed. Perhaps this is just another manifestation of the astounding persistence of the "dark shop tradition."

In view of what has been accomplished lately in the unit lighting of various other types of mechanical equipment—instrument panel illumination on automobiles and aircraft for example; and in view of developments in apparatus and materials having to do with lighting technique—including elongated "showcase" bulbs; sealed unit projector type bulbs; fluorescent tubes; translucent plastics for illuminated dials and panels and transparent plastics through which light actually can be "piped around corners" to illuminate otherwise inaccessible points; and safety glass for protective screens—there certainly are plenty of precedents for machine tool men to follow and a wealth of material with which they can work.

It may be interesting to note in passing that several of the most successful built-in illumination schemes lately adopted as standard, originally were intended merely as temporary expedients on equipment which was to have been exhibited at the National Machine Tool show, cancelled following the outbreak of the war.

Getting back once more to the illustrations, Fig. 1 shows a small Dumore grinder on which illumination is furnished by a showcase bulb adjustably mounted on the same support which carries a transparent safety shield. Similar combinations of lights and eyeshields have wide possibilities on various

other types of machines where the operator must watch high speed operations at close range.

Fig. 2 shows another ingenious combination unit in which elongated bulbs are used. This unit, which is an integral part of the work table assembly of the Taft-Peirce precision surface grinder, fulfills the dual functions of guard and lighting panel. In addition to lighting up the working area, its evenly illuminated ground safety glass screen facilitates "sighting" of work under the wheel—an important aid to the operator when carrying out the exacting operations required of a machine tool of this character.

While not illustrated herewith, a lighting unit somewhat similar to the foregoing is now built into the underside of the top plate or bridge of Greenlee 6-spindle automatic screw machines. This unit, which likewise is sealed in and protected by a heavy glass screen, brightly illuminates all slides, tools and collets in the working area. This is a great convenience when setting the tools and checking the many closely co-ordinated operations in a multiple spindle automatic.

The machine depicted in Fig. 4 is a Kearney & Trecker rotary head tool and die milling machine, whose operation entails precise settings by built-in micrometer controls and subsequent close observation of the work in process. For example, when used in sinking precision die casting and plastic molding dies, it is necessary to watch critical operations in deep pockets and on other ordinarily hard-to-see interior surfaces.

Dual projector-type fixtures are mounted on bosses at the sides of

the column—these fixtures being given a wide range of easy adjustment by a combination of swivel joints and flexible metallic tubing in the supporting arms. Having been engineered as integral parts of the machine, rather than "grafted on" after the mechanical design was completed, loose wiring has been eliminated by building the leads for these lighting fixtures into the frame of the machine, just as the power and control wiring is built-in.

Increased efficiency of machine tools through incorporation of simple refinements such as the foregoing obviously is out of all proportion to their cost. The amazing thing about the whole plant illumination situation is that in these enlightened times when there is so much talk about "bottle-necks in production," hundreds of highly skilled American mechanics and toolmakers still are trying to work to "split-thousandths" in light which would strain the eyes of a carpenter laying out the framework for a barn.

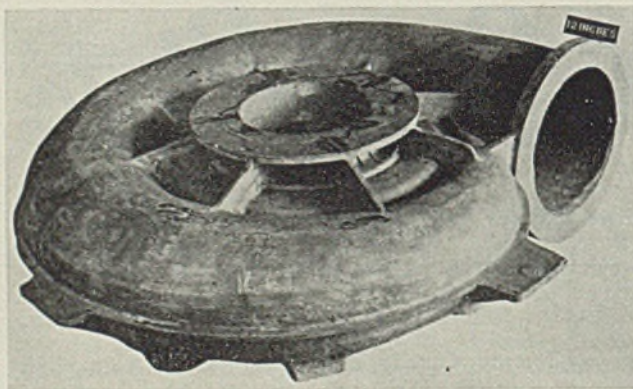
## To Furnish Fluorescent Units in Ten Colors

■ Fostoria Pressed Steel Corp., Fostoria, O., is now making available its entire line of fluorescent and silver bowl lighting units in a variety of ten different colors for the outside finish. The colors include hammered gray, hammered tan, hammered green, gloss white, gloss ivory, gloss gray, gloss green, wrinkle gray, wrinkle black and wrinkle brown. Other colors are available on special order.

This feature is made possible by the fact that all finishes on Fostoria units are baked by the near infra-red process in ovens.

## High Pressure Water Turbine Employs Unusual Casting

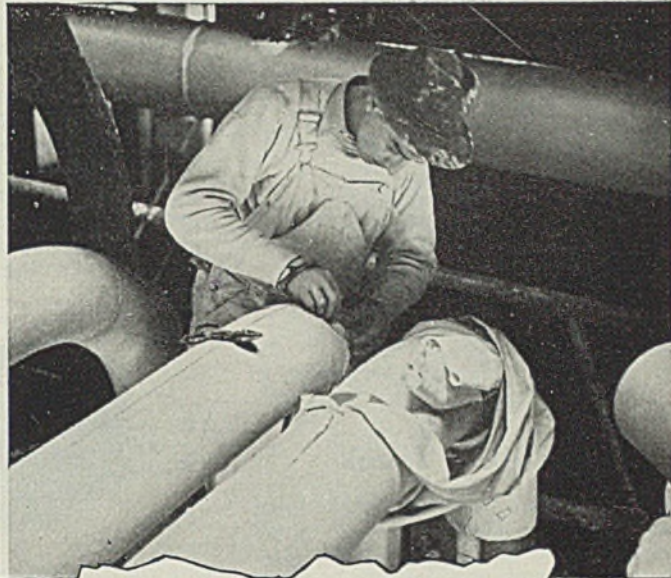
■ The cast steel scroll case shown weighs approximately 21,000 pounds and is one of two cast by Commercial Steel Casting Co., Marion, O., for vertical hydraulic turbines to be installed at the Shasta Dam, Ken-



nett division, Central Valley project, Calif. Each turbine will operate under maximum head of 475 feet of water, developing 7150 horsepower at 600 revolutions per minute.

Cast steel was required for these scroll cases because of the high unit stresses occasioned by the water pressure, and all dimensions had to be held within close limits to pass rigid government inspection.

Pressure castings such as these, and other pressure parts, are usually produced of cast steel. The designing engineers are not limited in reference to curves or curved sections in the part which they are designing. The fact that a part may be an unusual shape when completely designed need not compel the engineer to "slight" his idea because the part would be too expensive to produce, by other than casting. Therefore, the engineer can put strength into a part where it is needed and reduce sections where strength is not needed. This particular job is an excellent example of what can be done by the modern steel foundry with properly designed and constructed pattern equipment. Photo courtesy Steel Founders' Society of America, Cleveland.



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Out of the J-M Laboratories comes this lighter, stronger, more efficient insulation for temperatures up to 1500° F.—L-W Superex

For temperatures to 600°, J-M 85% Magnesia; to 700°, J-M Asbesto-Sponge Felted; to 1900°, J-M Superex. This has been standard insulation practice in thousands of plants.

Now, for intermediate temperatures up to 1500°, the J-M Laboratories have developed a companion product for these outstanding insulations—the new L-W Superex. Within this temperature range, L-W Superex blocks and pipe insulation provide the durability and permanence so characteristic of all J-M Insulations,

with the added advantages of light weight, high strength and increased insulating efficiency.

Between 1500° and 1900°, the former Superex, now known as H-T Superex, still remains No. 1 choice for reliability and maintained efficiency in service.

Detailed information on L-W Superex is now available in engineering data sheets. For your copies and facts on the complete line of J-M Insulations, just write Johns-Manville, 22 East 40th Street, New York, N. Y.



## Johns-Manville INDUSTRIAL INSULATIONS

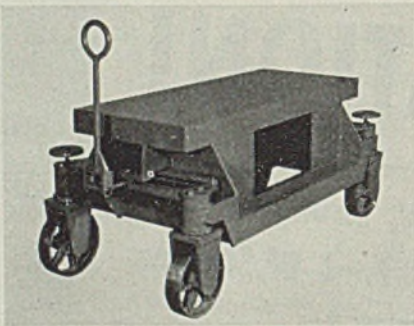
FOR EVERY TEMPERATURE... FOR EVERY SERVICE...

L-W Superex Blocks and Pipe Insulation... H-T Superex Blocks... Asbesto-Sponge Felted...  
85% Magnesia... Sil-O-Cel C-22 Brick... Rock Cork... JM-20 Brick



## Die Handling Truck

■ Lyon Iron Works, 580 Madison street, Greene, N. Y., has introduced a die handling truck for handling heavy dies near presses where the space for maneuvering is limited. It is furnished with auto steer at both ends which aids in maneuvering in close quarters. Wheels are controlled by a turning bar to which

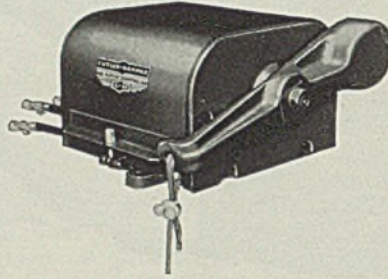


a removable handle is attached. This handle is arranged for hand drawing or towing. The truck is arranged so that wheels on either end may be locked in position for drawing at the opposite end. One wheel on each end is furnished with a braking arrangement. Capacity of the truck is 8000 pounds. Its platform measures 24 x 60 x 30 inches, and wheelbase 60 inches. Its overall length is 72 inches, wheel tread 31 inches, and overall width 34 inches. Trucks of other specifications, but of similar design also can be furnished. They may be equipped with either a stationary table as shown or with hydraulic elevating table.

## Crane Limit Stop

■ Cutler-Hammer Inc., 315 North Twelfth street, Milwaukee, announces a new main circuit crane safety limit stop to prevent over-travel of the crane hook when hoisting. It operates by means of a counter weighted lever and a suspended reset weight. As the hook approaches its limit of travel the reset weight is raised allowing the

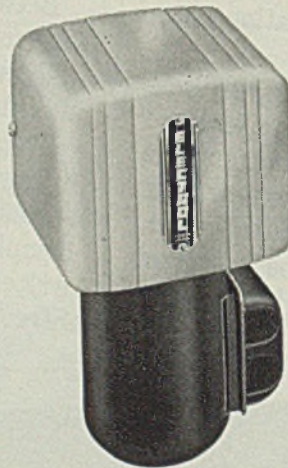
counter weight to trip the switch. A quick make and break mechanism opens the normally closed power contacts to disconnect the motor from the line and closes another set of contacts to connect a resistor across the motor circuit establishing quick, dynamic braking. Taps are provided to adjust the braking in accordance with the service condition. When the limit stop is in



tripped position, a by-pass circuit is established which permits backing out at slow speed. Features of the device include quick make and quick break tripping mechanism and enclosed weatherproof case. The limit stop may be mounted in any of four quadrants. It embodies flexible leads brought out through bushings in the case with lugs for external connecting. It has a rating of 100 horsepower at 230 volts direct current.

## Oven Burner

■ Electrol Inc., Clifton, N. J., has introduced a model LF burner for annealing ovens, core ovens, kilns, mold drying torches, ignition torches and all types of high temperature applications. It is particularly adapt-

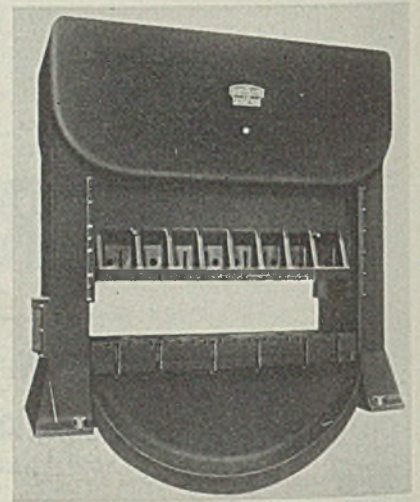


ed for large annealing ovens where a battery of burners is needed. It also is good for preheating large castings prior to welding. The burner is less than 1 foot high and less than 6 inches in depth. It can burn No. 1, 2, 3, 4 and light grades

of No. 5 oil. Equipped with a single nozzle, it has a capacity of ½ to 7 gallons of oil—with a dual nozzle, ½ to 14 gallons of oil. All working parts are protected by an aluminum cover.

## Two-Point Press

■ Cleveland Punch & Shear Works Co., 3917 St. Clair avenue, Cleveland, has introduced a new 2-point press which measures 156 inches between the uprights and has an overall height of 260 inches. It is symmetrical front and back, the double gearing and drive unit being located in the box type crown. It is equipped with a pneumatically operated friction clutch and brake. The flywheel is provided with an air brake which provides quick stops whenever the power is shut off. The bed, which has an area of



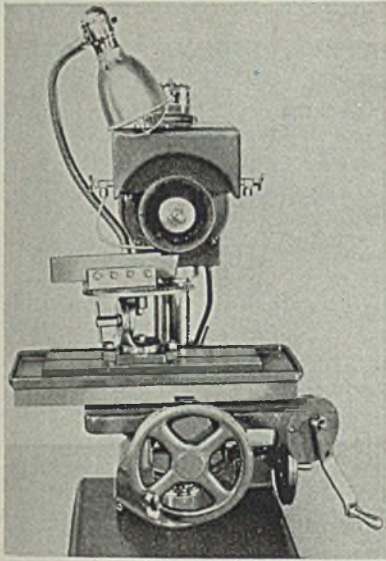
52 inches front to back and 156 inches right to left, is equipped with a T-slotted bolster plate and arranged with pneumatic cushions. The stroke of the slide is 12 inches. The press operates at a speed of 9 strokes per minute. All gears run in oil and there is an overflow limit in all gear housings to permit excess oil to return to the reservoir in the slide. The bearings are lubricated by an automatic pump. Press has capacity of 750 tons.

## Chip-Breaker Grinder

■ Carboloy Co. Inc., Box 239 R.Pk.A., Detroit, has introduced a low priced grinder for grinding chip-breakers in carbide tools. With it, exact forms of chip-breakers can be quickly duplicated when the tool is reground. The wheel-feed is provided with graduations so that chip-breakers can be ground to the exact depth desired. Resinoid diamond wheels of 100 grit are recommended for the grinder. Coolants recommended in order of



efficiency in keeping the wheel open, include: Stadoil, water with just enough soluble oil added to prevent



mushroom type floor switch, or by a special 2-stage toe operated floor switch. They also may be equipped for single spot nonbeat or automatic repeat operation. The welders feature heavy fabricated steel bases, transparent bowl pulsating type lubricators, jewelled pressure gages, bronze pressure regulators, test switches and piston packed air cylinders. Heat regulation is available from 6 to 48 points.

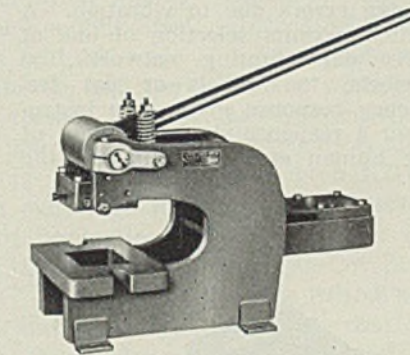
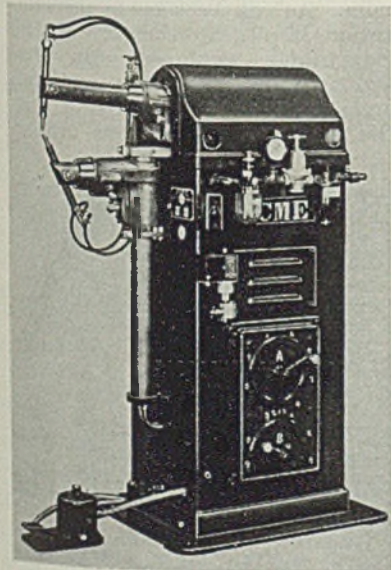
### Hand Punch Press

■ Leslie Welding Co., 2943 Carroll avenue, Chicago, announces a new hand operated punch press that has no ram, ways or slides, yet has the accuracy of a leader pin die set. It is especially adapted to blanking or punching small stampings or punching along the edges of large sheets. A feature of this press is the means for maintaining alignment or registration of punches and dies in a leaf arm that is rigid except at its

rusting, and kerosine. The grinder is designed for use with tools up to 1 1/4 inches wide. Operation is through a 110-volt 60-cycle single dustproof ball-bearing alternating current motor, equipped with reversing switch. Special motors for 220-volt and 25 or 50-cycle current are available.

### Spot Welders

■ Acme Electric Welder Co., Huntington Park, Calif., announces a complete line of air-operated rocker arm spot welders in transformer



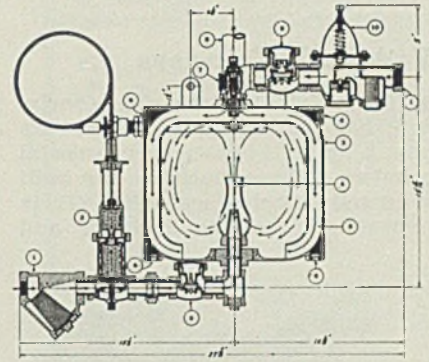
flexing point. Because of the rigidity of the leaf arm, and also because of the wide bearing, it is unnecessary to center the load on the punch plate.

Designed to accommodate readily most blanking punches ordinarily used on small presses, the punch plate is 4 x 4 1/4 inches. The clearance from punch plate center to frame is 6 inches. The stroke is 7/16-inch and stroke adjustment 1/4-inch. Press capacity is 2-inch diameter hole through 14 gage mild steel or 16 gage 18-8 stainless steel.

### Injection Type Steam And Water Mixing Unit

■ W. J. O'Brien Co., Syracuse, N. Y., has introduced a new industrial injection type steam and water mixing unit capable of producing up to 3000 gallons per hour at any desired controlled temperature. Only three connections are necessary for its installation; one connection to the cold water line, another to the high pressure (50 to 150 pounds) steam line and a third for the hot water outlet. The unit measures only 2 1/2 feet long by 2 feet high and weighs less than 100

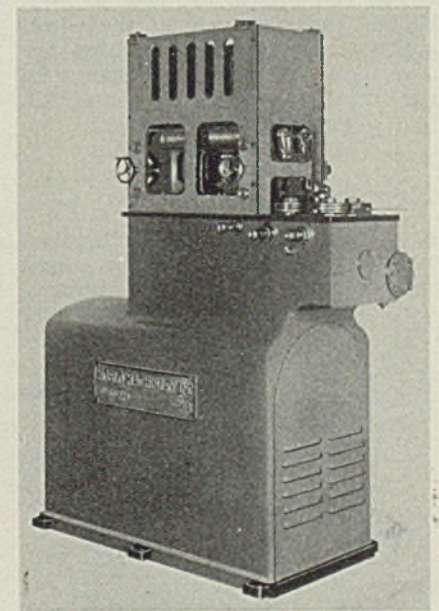
pounds. It is available in either 1/2, 3/4 or 1-inch steam connections, and with any one of four selected, ad-



justed water temperature ranges. Provision for tempering inlet water and recirculating mixer water reduces noise and lime deposit.

### Welding Rod Hopper Feeding Machine

■ Moslo Machinery Inc., 5005 Euclid avenue, Cleveland, has introduced a welding rod hopper feeding machine, which passes straightened and cut wires or rods into an extrusion press for application of coating material to the rods. Built of steel plates, it has a capacity of about 500 pounds of wire rods. Guide plates of the feeding mechanism are arranged so adjustment is obtained from a hand screw. Speed is controlled through an adjustable drive. The feeder rolls are



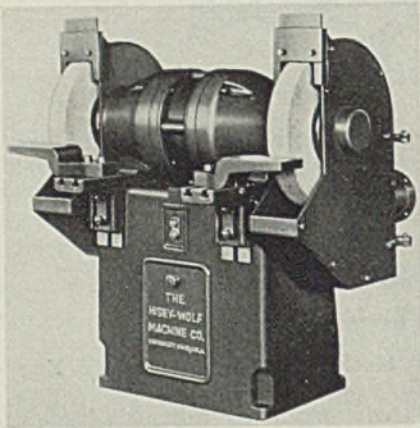
placed in a vertical plane while support shafts are positioned horizontally. The pickup rolls have a hand screw adjustment so that movement in or out is simultaneous. Feed pressure is maintained through a heavy duty spring. The

capacities of 10 to 75 kilovolt amperes. These are equipped with automatic weld timers and welder service magnetic contactors. They are offered in various styles—actuated by either a foot valve and limit switch, by a solenoid operated

power drive mechanism is totally enclosed, running in oil. The feeder is supplied in sizes to take wire in 18, 24 or 36-inch lengths.

## Pedestal Grinders

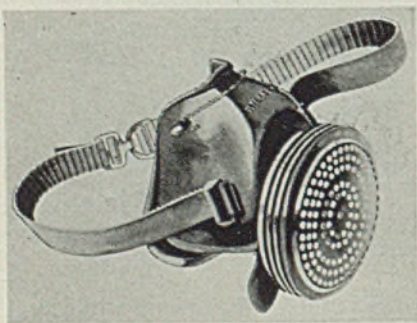
■ Hisey-Wolf Machine Co., Cincinnati, has placed on the market its new 5 and 7½-horsepower pedestal grinders. These machines are built in 18 and 20-inch wheel sizes. Their motors are totally enclosed and



ventilated through the large pedestal. A continuous circulation of air passes through the motor and out of one motor foot into the pedestal and then into the other motor foot and through the motor again. These machines can be supplied with the new guards as illustrated. The guards make it impossible for a piece of work to jam in between the wheel and guard. It also extends beyond the periphery of the wheel so that all sparks and chips are arrested. In addition, the flange on the outlet makes an easy connection to the dust collecting system.

## Respirator

■ Wilson Products Inc., Reading, Pa., has introduced a new light weight Bantam filter-type respirator which can be worn for long

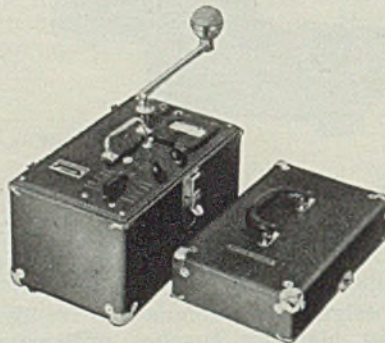


periods without causing any noticeable discomfort or slowing down of the worker. From headband to exhaust valve it is a completely rugged assembly. It does not fea-

ture any delicate parts and can stand rough punishment. Its all rubber face piece cannot be crushed out of shape and the screw type filter assembly is readily put together.

## Sound-Level Meter

■ General Electric Co., Schenectady, N. Y., announces a new light-weight portable sound-level meter which may be used readily for almost any kind of noise study. It weighs only 19 pounds, but has a range of 24 to 120 decibels or roughly from the rustle of leaves to the scream of a factory whistle. Essential parts of the device are a microphone, an amplifier and an indicating instrument. An arm extension protects the microphone from sound reflected from the case. The amplifier consists of five stages which are resistance coupled. The battery-operated tubes are mounted on a shock-proof base, thus reducing errors due to vibration. A switch permits selection of one of three ear-weighting networks, 40 decibels, 70 decibels or flat frequency response giving the instrument a response similar to that of the human ear. In field use the

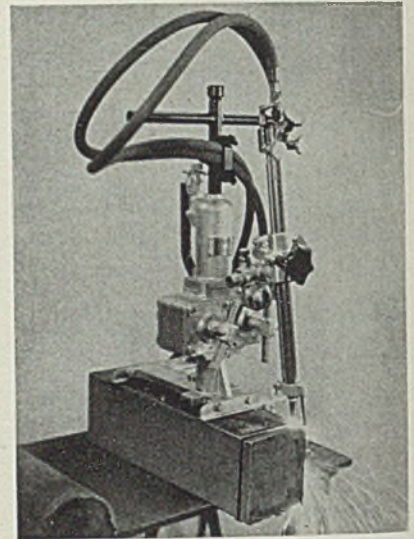


instrument is calibrated by applying a precision mouth-blown calibrating unit to the microphone. After adjustment a single knob controls the instrument. The complete instrument is contained in a carrying case 12¾ inches long, 7¾ inches wide and 9¼ inches high. The instrument is designed so a vibration velocity unit may be substituted for the microphone.

## Bar Cutting Machine

■ The Linde Air Products Co., unit of Union Carbide & Carbon Corp., 30 East Forty-second street, New York, announces an oxyacetylene cutting machine for cutoff operations on round and square bars. Known as the Oxweld CM-35, the machine will cut with a minimum of adjustment and is driven by a self-contained spring-power unit, the speed of which is controlled hy-

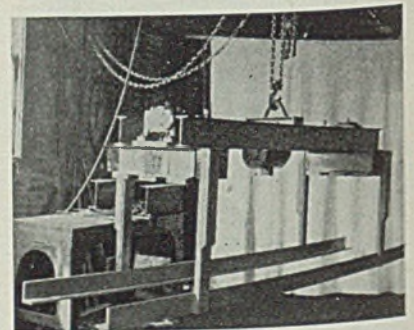
draulically. The correct blowpipe motion for cutting is transmitted by an adjustable linkage mechanism. The hydraulic control provides an



almost infinite variation of cutting speeds between 1 and 75 inches per minute. The cutting machine can be used indoors or out, and can be moved to a new location since neither electric power nor guide track is necessary for its operation.

## Motor-Driven Grab

■ J-B Engineering Sales Co., New Haven, Conn., has placed on the market a newly designed Mansaver grab for handling sheet steel, loaded boxes and trucks. Its construction is such that it requires little headroom. As can be seen in the illustration, the grab consists of two end frames equipped with slide beams, four drop legs and two angle irons for carrying the load. The legs and angle irons are at-



tached to the slide beams. By means of a rack and pinion arrangement, the slide beams can be moved in and out in unison, enabling it to pick up loads of various widths. The motor is inverted so that no part of it comes below the main frame of the grab. These units are available in capacities up to 50,000 pounds.

# Steel Stability Apparent

## For Remainder of 1940

*Industry looking towards 1941 with prediction of strong rate throughout.*

*Rail steel bars advanced \$2 a ton.*

■ SINCE the pattern of the steel industry for the rest of 1940 is clearly defined more attention is given to prospects for 1941, a typical observation having been that of T. M. Girdler, chairman of Republic Steel Corp., last week, that full operations will be maintained throughout the year provided Britain and Germany still are actively hostile. Many foresee the beginning of second quarter as the zero hour of a tense situation, by which time stocks of pig iron, ingots and semifinished steel may have been exhausted and consumption supplied solely by current production.

Ingot production last week gained 1 point to 97 per cent, the best since May, 1929.

Some of the anticipated bottlenecks have failed to materialize. The industry is fairly well balanced from standpoint of supplies, character of demand and dates of delivery.

Occasionally exceptions to the general trend are encountered. Chicago reports that some lines, such as flat-rolled products, show some decreases in demand, with the suggestion that generally this may be the top of steel activity for the year, small recessions being possible henceforth. The desire to hold down year-end inventories may have a bearing. In other centers warehouses have in rare cases reported sales volume as less than a month ago. Wire rope deliveries from mills have been made in as little as 48 hours.

Consumers have become more reconciled to late deliveries and are more willing to submit to rationing and other measures to promote greatest good for the largest number. The situation is better in many respects than during the World war. Then pig iron ranged in price from \$33 to \$55 per ton as against \$23 today. Deliveries on fabricated structural steel then were nine to ten months off as against 60 to 90 days now. Ingot capacity is now around 80,000,000 tons yearly as against under 50,000,000 tons when the World war closed.

Rail steel bars have been advanced \$2 per ton to a parity with billet steel bars because of scarcity of scrap rails. General first quarter price announcements are expected at any moment.

Pennsylvania railroad has ordered 75,000 tons of

rails, the largest so far this fall. Considering that this is usually the main rail buying season of the year demand has been rather slow, especially compared with other steel items.

Automobile production is down 9603 units at 102,340 for the week ended Nov. 23, the first drop in several weeks, comparing with 72,520 a year ago.

Structural shape awards for 1940, through Nov. 23, have been 1,317,506 net tons as against 1,305,049 tons for all of 1939.

The severe bombing of British industrial centers, such as Coventry and Birmingham, is expected to increase British purchases of steel in this country. Some estimate that between 300,000 and 400,000 tons of iron and steel for Britain are now in active negotiation. Shipments to Canada are reported as 100,000 tons monthly, with South America counted on for purchase of 100,000 tons monthly over the near future. Steel exports for 1940 to date, are estimated to have closely approached, or exceeded, the 6,300,000 tons in all of 1917.

Steel operations last week increased in six districts as follows: Pittsburgh by 3 points to 97 per cent; Chicago 1 point to 95; Buffalo 2½ points to 93; Cincinnati 9½ points to 97½, St. Louis 2½ points to 87½ and Detroit 3 points to 96. Youngstown and Eastern Pennsylvania were unchanged at 93 and 94 per cent, respectively. Output fell in four districts as follows: Wheeling 5 points to 93½, Cleveland 2 points to 86, Birmingham 3 points to 97 and New England 3 points to 82 per cent.

Galvanized sheet production has been raised 1 point to 82 per cent of capacity, a new high for the year. Tin plate, however, is merely holding its own at around 45 per cent.

Iron ore consumption in October at 6,051,347 tons was the second largest since records were kept from 1918, that of May, 1923 having been 6,119,000 tons. Cumulative consumption for the year to Nov. 1 has been 50,280,269 tons, or 50 per cent higher than the same period of 1939.

STEEL'S three composite prices are unchanged, iron and steel at \$38.07, finished steel at \$56.60 and steel-works scrap at \$20.71.

## MARKET IN TABLOID ★

### *Demand*

*Shows no sign of receding.*

### *Prices*

*Rising in few items*

### *Production*

*Up 1 point to 97 per cent, top since May, 1929.*

# COMPOSITE MARKET AVERAGES

	Nov. 23	Nov. 16	Nov. 9	One Month Ago Oct., 1940	Three Months Ago Aug., 1940	One Year Ago Nov., 1939	Five Years Ago Nov., 1935
Iron and Steel....	\$38.07	\$38.07	\$38.06	\$38.07	\$37.70	\$37.50	\$33.15
Finished Steel ....	56.60	56.60	56.60	56.60	56.60	55.90	53.70
Steelworks Scrap..	20.71	20.71	20.54	20.56	18.71	20.06	12.92

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

## COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material	Nov. 23,	Oct.	Aug.	Nov.	Pig Iron	Nov. 23,	Oct.	Aug.	Nov.
	1940	1940	1940	1939		1940	1940	1940	1939
Steel bars, Pittsburgh .....	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh .....	\$24.34	\$24.34	\$24.34	\$24.34
Steel bars, Chicago .....	2.15	2.15	2.15	2.15	Basic, Valley .....	22.50	22.50	22.50	22.50
Steel bars, Philadelphia .....	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia .....	24.34	24.34	24.34	24.34
Iron bars, Chicago .....	2.25	2.25	2.15	2.15	No. 2 foundry, Pittsburgh .....	24.21	24.21	24.21	24.21
Shapes, Pittsburgh .....	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago .....	23.00	23.00	23.00	23.00
Shapes, Philadelphia .....	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham .....	19.38	19.38	19.38	19.38
Shapes, Chicago .....	2.10	2.10	2.10	2.10	Southern No. 2 del. Cincinnati .....	23.06	23.06	23.06	23.06
Plates, Pittsburgh .....	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ. av.) .....	25.215	25.215	25.215	25.215
Plates, Philadelphia .....	2.15	2.15	2.15	2.275	Malleable, Valley .....	23.00	23.00	23.00	23.00
Plates, Chicago .....	2.10	2.10	2.10	2.10	Malleable, Chicago .....	23.00	23.00	23.00	23.00
Sheets, hot-rolled, Pittsburgh .....	2.10	2.10	2.10	2.00	Lake Sup., charcoal, del. Chicago .....	30.34	30.34	30.34	30.34
Sheets, cold-rolled, Pittsburgh .....	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh .....	23.17	23.17	23.17	23.17
Sheets, No. 24 galv., Pittsburgh .....	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh .....	125.33	125.33	125.33	105.33
Sheets, hot-rolled, Gary .....	2.10	2.10	2.10	2.00					
Sheets, cold-rolled, Gary .....	3.05	3.05	3.05	3.05					
Sheets, No. 24 galv., Gary .....	3.50	3.50	3.50	3.50					
Bright bess., basic wire, Pitts. ....	2.60	2.60	2.60	2.60					
Tin plate, per base box, Pitts. ....	\$5.00	\$5.00	\$5.00	\$5.00					
Wire nails, Pittsburgh .....	2.55	2.55	2.55	2.55					

### Semifinished Material

Sheet bars, Pittsburgh, Chicago ..	\$34.00	\$34.00	\$34.00	\$34.00
Slabs, Pittsburgh, Chicago .....	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh .....	34.00	34.00	34.00	34.00
Wire rods No. 5 to 3/4-inch, Pitts. ..	2.00	2.00	2.00	1.92

### Scrap

Heavy melt. steel, Pitts. ....	\$21.50	\$21.30	\$18.75	\$21.90
Heavy melt. steel, No. 2, E. Pa. ....	19.75	19.75	18.35	19.25
Heavy melting steel, Chicago .....	20.25	19.85	18.15	17.45
Rails for rolling, Chicago .....	24.50	24.05	22.00	20.50
Railroad steel specialties, Chicago ..	23.25	23.25	21.05	21.50

### Coke

Connellsville, furnace, ovens .....	\$4.75	\$4.75	\$4.75	\$5.00
Connellsville, foundry, ovens .....	5.75	5.75	5.75	6.00
Chicago, by-product fdry., del. ....	11.75	11.75	11.25	11.25

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

### Sheet Steel

Hot Rolled	
Pittsburgh .....	2.10c
Chicago, Gary .....	2.10c
Cleveland .....	2.10c
Detroit, del. ....	2.20c
Buffalo .....	2.10c
Sparrows Point, Md. ....	2.10c
New York, del. ....	2.34c
Philadelphia, del. ....	2.27c
Granite City, Ill. ....	2.20c
Middletown, O. ....	2.10c
Youngstown, O. ....	2.10c
Birmingham .....	2.10c
Pacific Coast ports .....	2.65c
Cold Rolled	
Pittsburgh .....	3.05c
Chicago, Gary .....	3.05c
Buffalo .....	3.05c
Cleveland .....	3.05c
Detroit, delivered .....	3.15c
Philadelphia, del. ....	3.37c
New York, del. ....	3.39c
Granite City, Ill. ....	3.15c
Middletown, O. ....	3.05c
Youngstown, O. ....	3.05c
Pacific Coast ports .....	3.70c
Galvanized No. 24	
Pittsburgh .....	3.50c
Chicago, Gary .....	3.50c
Buffalo .....	3.50c
Sparrows Point, Md. ....	3.50c
Philadelphia, del. ....	3.67c
New York, delivered .....	3.74c
Birmingham .....	3.50c

Granite City, Ill. ....	3.60c
Middletown, O. ....	3.50c
Youngstown, O. ....	3.50c
Pacific Coast ports .....	4.05c
Black Plate, No. 29 and Lighter	
Pittsburgh .....	3.05c
Chicago, Gary .....	3.05c
Granite City, Ill. ....	3.15c
Long Ternes No. 24 Unassorted	
Pittsburgh, Gary .....	3.80c
Pacific Coast .....	4.55c
Enameling Sheets	
	No. 10 No. 20
Pittsburgh .....	2.75c 3.35c
Chicago, Gary .....	2.75c 3.35c
Granite City, Ill. ....	2.85c 3.45c
Youngstown, O. ....	2.75c 3.35c
Cleveland .....	2.75c 3.35c
Middletown, O. ....	2.75c 3.35c
Pacific Coast .....	3.40c 4.00c

### Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.			
Chrome-Nickel			
	No. 10	No. 302	No. 304
Bars .....	24.00	25.00	
Plates .....	27.00	29.00	
Sheets .....	34.00	36.00	
Hot strip .....	21.50	23.50	
Cold strip .....	28.00	30.00	
Straight Chromes			
	No. No.	No. No.	No. No.
	410	430	442 446
Bars .....	18.50	19.00	22.50 27.50

Plates .....	21.50	22.00	25.50	30.50
Sheets .....	26.50	29.00	32.50	36.50
Hot strip .....	17.00	17.50	24.00	35.00
Cold stp. ....	22.00	22.50	32.00	52.00

### Steel Plate

Pittsburgh .....	2.10c
New York, del. ....	2.29c
Philadelphia, del. ....	2.15c
Boston, delivered .....	2.46c
Buffalo, delivered .....	2.33c
Chicago or Gary .....	2.10c
Cleveland .....	2.10c
Birmingham .....	2.10c
Coatesville, Pa. ....	2.10c
Sparrows Point, Md. ....	2.10c
Claymont, Del. ....	2.10c
Youngstown .....	2.10c
Gulf ports .....	2.45c
Pacific Coast ports .....	2.65c

### Steel Floor Plates

Pittsburgh .....	3.35c
Chicago .....	3.35c
Gulf ports .....	3.70c
Pacific Coast ports .....	4.00c

### Structural Shapes

Pittsburgh .....	2.10c
Philadelphia, del. ....	2.21 1/2 c
New York, del. ....	2.27c
Boston, delivered .....	2.41c
Bethlehem .....	2.10c
Chicago .....	2.10c
Cleveland, del. ....	2.30c
Buffalo .....	2.10c

### Tin and Terne Plate

Tin Plate, Coke (base box)	
Pittsburgh, Gary, Chicago .....	\$5.00
Granite City, Ill. ....	5.10
Mfg. Terne Plate (base box)	
Pittsburgh, Gary, Chicago .....	\$4.30
Granite City, Ill. ....	4.40

### Bars

Soft Steel	
(Base, 20 tons or over)	
Pittsburgh .....	2.15c
Chicago or Gary .....	2.15c
Duluth .....	2.25c
Birmingham .....	2.15c
Cleveland .....	2.15c
Buffalo .....	2.25c
Detroit, delivered .....	2.47c
Philadelphia, del. ....	2.52c
Boston, delivered .....	2.50c
New York, del. ....	2.49c
Gulf ports .....	2.50c
Pacific Coast ports .....	2.80c

### Rail Steel

(Base, 5 tons or over)	
Pittsburgh .....	2.15c
Chicago or Gary .....	2.15c
Detroit, delivered .....	2.25c
Cleveland .....	2.15c

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**

<b>New Billet Bars, Base</b>	
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

<b>Rail Steel Bars, Base</b>	
Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.50c

**Wire Products**

<b>Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads</b>	
Standard and cement coated wire nails	\$2.55

<b>(Per Pound)</b>	
Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c

<b>Woven wire fencing (base C. L. column)</b>	
Single loop bale ties, (base C.L. column)	67
Galv. barbed wire, 80-rod spools, base column	70
Twisted barbless wire, column	70

<b>To Manufacturing Trade</b>	
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
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**Cold-Finished Bars**

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	3.35c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c
*Delivered.		

**Alloy Bars (Hot)**

<b>(Base, 20 tons or over)</b>			
Pittsburgh, Buffalo, Chi. Chicago, Massillon, Canton, Bethlehem			
			2.70c
Detroit, delivered			
			2.80c
<b>Alloy Alloy</b>			
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.			
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
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**Strip and Hoops**

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

<b>Hot Strip, 12-inch and less</b>	
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

<b>Cooperage hoop, Young., Pitts.; Chicago, Birm.</b>	
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown Chicago	2.20c
Detroit, del.	2.90c
Worcester, Mass.	3.00c
<b>Carbon Cleve., Pitts.</b>	
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.

<b>Commodity Cold-Rolled Strip</b>	
Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c
Lamp stock up 10 cents.	

**Rails, Fastenings**

<b>(Gross Tons)</b>	
Standard rails, mill	\$40.00
Relay rails, Pittsburgh 20-100 lbs.	32.50-35.50
<b>Light rails, billet qual., Pitts., Chicago, B'ham.</b>	
Do., rerolling quality	39.00
<b>Cents per pound</b>	
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**

<b>F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%. Full containers, add 10%.</b>	
<b>Carriage and Machine</b>	
½ x 6 and smaller	.68 off
Do., ¾ and ¾ x 6-in. and shorter	.66 off
Do., ¾ to 1 x 6-in. and shorter	.64 off
1 ¼ and larger, all lengths	.62 off
All diameters, over 6-in. long	.62 off
Tire bolts	.52.5 off

<b>Stove Bolts</b>	
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

<b>Nuts</b>			
Semifinished hex.	U.S.S.	S.A.E.	
½-inch and less	66	70	
¾-1-inch	63	65	
1-1 ½-inch	61	62	
1 ½ and larger	60		

<b>Hexagon Cap Screws</b>	
Upset 1-in., smaller	.70.0 off
<b>Square Head Set Screws</b>	
Upset, 1-in., smaller	.75.0 off
Headless set screws	.64.0 off

**Piling**

Pitts., Chgo., Buffalo	2.40c
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**Rivets, Washers**

<b>F.o.b. Pitts., Cleve., Chgo., B'ham.</b>	
Structural	3.40c
¾-inch and under	.65-10 off
<b>Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off</b>	

**Welded Iron, Steel Pipe**

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 ½ and 1 ½ less, respectively. Wrought pipe, Pittsburgh base.

<b>Butt Weld Steel</b>			
In.	Blk.	Galv.	
½	63 ½	54	
¾	66 ½	58	
1-3	68 ½	60 ½	

<b>Iron</b>			
¾	30	13	
1-1 ¼	34	19	
1 ½	38	21 ½	
2	37 ½	21	

<b>Lap Weld Steel</b>			
2	61	52 ½	
2 ½-3	64	55 ½	
3 ½-6	66	57 ½	
7 and 8	65	55 ½	

<b>Iron</b>			
2	30 ½	15	
2 ½-3 ½	31 ½	17 ½	
4	33 ½	21	
4 ½-8	32 ½	20	
9-12	28 ½	15	

<b>Line Pipe Steel</b>			
1 to 3, butt weld	67 ½		
2, lap weld	60		
2 ½ to 3, lap weld	63		
3 ½ to 6, lap weld	65		
7 and 8, lap weld	64		

<b>Iron</b>			
¾ butt weld	25	7	
1 and 1 ¼ butt weld	29	13	
1 ½ butt weld	33	15 ½	
2 butt weld	32 ½	15	
1 ½ lap weld	23 ½	7	
2 lap weld	25 ½	9	
2 ½ to 3 ½ lap weld	26 ½	11 ½	
4 lap weld	28 ½	15	
4 ½ to 8 lap weld	27 ½	14	
9 to 12 lap weld	23 ½	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.

<b>Lap Welded</b>			
Sizes	Gage	Steel	Charcoal
1 ½" O.D.	13	\$ 9.72	\$23.71
1 ¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2 ¼" O.D.	13	13.79	21.68
2 ½" O.D.	12	15.16	
2 ¾" O.D.	12	16.58	26.57
3" O.D.	12	17.54	29.00
3 ½" O.D.	12	18.35	31.36
4" O.D.	11	23.15	39.81
4 ½" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
3" O.D.	7	68.14	

<b>Seamless</b>			
Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	\$ 7.82	\$ 9.01
1 ¼" O.D.	13	9.26	10.67
1 ½" O.D.	13	10.23	11.79
1 ¾" O.D.	13	11.64	13.42

2" O.D.	13	13.04	15.03
2 ¼" O.D.	13	14.54	16.76
2 ½" O.D.	12	16.01	18.45
2 ¾" O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 ½" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 ½" O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

**Cast Iron Pipe**

<b>Class B Pipe—Pet Net Ton</b>	
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. figs., Birm., base \$100.00.	

**Semifinished Steel**

<b>Rerolling Billets, Slabs (Gross Tons)</b>	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00
<b>Forging Quality Billets</b>	
Pitts., Chi., Gary, Cleve., Young, Buffalo, Birm.	40.00
Duluth	42.00

<b>Sheet Bars</b>	
Pitts., Cleveland, Youngs., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

<b>Wire Rods</b>	
Pitts., Cleveland, Chicago, Birmingham No. 5 to ¾-inch incl. (per 100 lbs.)	\$2.00
Do., over ¾ to 1 ¼-in. incl.	2.15
Worcester up \$0.10; Galveston up \$0.25; Pacific Coast up \$0.50.	

<b>Skelp</b>	
Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

**Coke**

<b>Price Per Net Ton</b>	
<b>Beehive Ovens</b>	
Connellsville, fur.	\$4.35-4.60
Connellsville, fdry.	5.25-5.50
Connell, prem. fdry.	5.75-6.25
New River fdry.	6.50-7.00
Wise county fdry.	5.50-6.50
Wise county fur.	5.00-5.25

<b>By-Product Foundry</b>	
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**

<b>Spot, gal., freight allowed east of Omaha</b>	
Pure and 90% benzol	14.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xylo	26.00c
<b>Per lb. f.o.b. Frankford and St. Louis</b>	
Phenol (less than 1000 lbs.)	13.75c
Do. (1000 lbs. or over)	12.75c
<b>Eastern Plants, per lb.</b>	
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	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	.....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
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.	23.00	23.00	22.50	23.50
Provo, Utah	22.00	.....	.....	.....
*Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

†Subject to 38 cents deduction for 0.70 per cent phosphorus or higher. \*One producer quotes \$2 higher on bessemer, \$1.50 higher on other grades.

Delivered from Basing Points:	24.39	24.39	23.89	24.89
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	†Neville base, plus 69c, 84c, and \$1.24 freight.			
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	\$22.50 Lake Superior fur. .... \$27.00
Pitts. dist. fur.	22.50 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.)
<b>Fire Clay Brick</b>	Dry press. .... \$28.00
<i>Super Quality</i>	Wire cut. .... 26.00
Pa., Mo., Ky.	<b>Magnesite</b>
<i>First Quality</i>	Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk. .... 22.00
Pa., Ill., Md., Mo., Ky.	net ton, bags. .... 26.00
Alabama, Georgia	<b>Basic Brick</b>
New Jersey	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.
<i>Second Quality</i>	Chrome brick. .... \$50.00
Pa., Ill., Ky., Md., Mo.	Chem. bonded chrome. .... 50.00
Georgia, Alabama	Magnesite brick. .... 72.00
New Jersey	Chem. bonded magnesite. .... 61.00
<b>Ohio</b>	
First quality. .... 39.90	<b>Fluorspar</b>
Intermediate. .... 36.10	Washed gravel, duty pd., tide, net ton. \$25.00-\$26.00
Second quality. .... 31.35	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail. 20.00-21.00
<b>Malleable Bung Brick</b>	Do, barge. .... 20.00
All bases. .... \$56.05	No. 2 lump. .... 20.00-21.00
<b>Silica Brick</b>	
Pennsylvania. .... \$47.50	
Joliet, E. Chicago. .... 55.10	
Birmingham, Ala. .... 47.50	

## Ferroalloy Prices

<b>Ferromanganese, 78-82%, carlots, duty pd.</b> \$120.00	Do., ton lots. .... 11.75c	Do., spot. .... 145.00	<b>Silicon Metal, 1% iron, contract, carlots, 2 x 1/4-in., lb.</b> 14.50c
Ton lots. .... 130.00	Do., less-ton lots. .... 12.00c	Do., contract, ton lots. .... 145.00	Do., 2% . .... 13.00c
Less ton lots. .... 133.50	less than 200 lb. lots. 12.25c	Do., spot, ton lots. .... 150.00	Spot 1/4c higher
Less 200 lb. lots. .... 138.00	<b>67-72% low carbon:</b>	15-18% ti., 3-5% carbon, carlots, contr., net ton. 157.50	<b>Silicon Briquets, contract carloads, bulk, freight allowed, ton</b> \$74.50
Do., carlots del. Pitts. 125.33	Car-Ton Less loads lots ton	Do., spot. .... 160.00	Ton lots. .... \$4.50
<b>Splegeleisen, 19-21% dom.</b>	2% carb. .... 17.50c 18.25c 18.75c	Do., contract, ton lots. .... 160.00	Less-ton lots, lb. .... 4.00c
Palmerton, Pa., spot. .... 36.00	1% carb. .... 18.50c 19.25c 19.75c	Do., spot, ton lots. .... 165.00	Less 200 lb. lots, lb. .... 4.25c
Do., 26-28% . .... 49.50	0.10% carb. 20.50c 21.25c 21.75c	<b>Alsifer, contract carlots, f.o.b. Niagara Falls, lb.</b> 7.50c	Spot 1/4-cent higher
<b>Ferrosilicon, 50%, freight allowed, c.l.</b> 74.50	0.20% carb. 19.50c 20.25c 20.75c	Do., ton lots. .... 8.00c	<b>Manganese Briquets, contract carloads, bulk freight allowed, lb.</b> 5.50c
Do., ton lot. .... 87.00	Spot 1/4c higher	Do., less-ton lots. .... 8.50c	Ton lots. .... 6.00c
Do., 75 per cent. .... 135.00	<b>Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.</b> 0.95	Spot 1/4c lb. higher	Less-ton lots. .... 6.25c
Do., ton lots. .... 151.00	<b>Calcium molybdate, lb. molyb. cont., f.o.b. mill</b> 0.80	<b>Chromium Briquets, contract, freight allowed, lb. carlots, bulk</b> 7.00c	Spot 1/4c higher
<b>Silicomanganese, c.l., 3 per cent carbon.</b> 113.00	<b>Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots.</b> \$1.23	Do., ton lots. .... 7.50c	<b>Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton</b> 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	Do., less-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, 1/4c higher	Do., ton lots. .... 15.00c
<b>Ferrotungsten, stand., lb. con. del. cars</b> 1.90-2.00	Spot 5c higher	<b>Tungsten Metal Powder, according to grade, drum shipment, 200-lb. spot lots, lb.</b> \$2.50	Do., less-ton lots. .... 16.00c
<b>Ferrovandium, 35 to 40%, lb., cont.</b> 2.70-2.80-2.90	<b>Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls.</b> \$2.25	Do., smaller lots. .... 2.60	Spot 1/4c higher
<b>Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric turn., per ton, c. i., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage</b> 75.00	Do., less-ton lots. .... 2.30	<b>Vanadium Pentoxide, contract, lb. contained</b> \$1.10	<b>Molybdenum Powder, 99%, f.o.b. York, Pa.</b> \$2.60
<b>Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots</b> 11.00c	Spot is 10c higher	Do., spot. .... 1.15	200-lb. kegs, lb. .... 2.75
	<b>Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill.</b> 0.80	<b>Chromium Metal, 98% cr., contract, lb. con. chrome, ton lots.</b> 80.00c	Do., 100-200 lb. lots. .... 3.00
	<b>Ferro-carbon-titanium, 15-18% ti., 6-8% carb., carlots, contr., net ton.</b> \$142.50	Do., spot. .... 85.00c	Do., under 100-lb. lots
		88% chrome, cont. tons. 79.00c	<b>Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant</b> 80.00c
		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		Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars		
							Hot Rolled	Cold Rolled			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	4.66	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	4.55	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	8.15	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	8.50	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	8.15	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	6.98
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.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	...	5.25	...	...	...	...
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	4.00	4.00	6.40	4.30	6.50	5.25	...	6.60	10.55	9.80
San Francisco	3.50	4.00	6.00	3.35	3.35	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	4.18	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	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	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; 300-4999 in San Francisco, Portland; 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, San Francisco; 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.

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—

Domestic Prices at Works or Furnace—

	By Cable or Radio		Last Reported				
	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons	**Quoted in gold pounds sterling £ s d	French ††Francs	Belgian ††Francs	Reich ††Mark
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	...	2.77c	...	7 6 0	...	...	...
Structural shapes	2.97c 16 10 0	2.83c	...	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 mm.	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	...	2.78c	...	7 5 0	...	...	...
Plain wire, base	...	2.15c	...	8 6 3	...	...	...
Galvanized wire, base	...	3.75c	...	9 17 6	...	...	...
Wire nails, base	...	3.56c	...	9 7 6	...	...	...
Tin plate, box 108 lbs.	\$6.36	1 11 6	...	...	...	...	...

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

\*\*Gold pound sterling not quoted. ††No quotations.

# 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.	18.00
Bos. dock No. 1 exp.	16.00-16.50
New Eng. del. No. 1	17.00
Buffalo, No. 1.....	21.50-22.00
Buffalo, No. 2.....	19.50-20.00
Chicago, No. 1.....	20.00-20.50
Chicago, auto, no alloy	19.00-19.50
Cincinnati, dealers.	17.50-18.00
Cleveland, No. 1.....	20.50-21.00
Cleveland, No. 2.....	19.50-20.00
Detroit, No. 1.....	†16.00-16.50
Detroit, No. 2.....	†15.00-15.50
Eastern Pa., No. 1.	20.50-21.00
Eastern Pa., No. 2.	19.50-20.00
Federal, Ill., No. 2.	16.75-17.25
Granite City, R. R. No. 1	17.00-17.50
Granite City, No. 2.	16.25-16.75
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.)	23.00-23.50
Pittsburgh, No. 1.	21.00-22.00
Pittsburgh, No. 2.	19.50-20.00
St. Louis, No. 1.....	17.50-18.00
St. Louis, No. 2.....	16.25-16.75
San Fran., No. 1 net	13.00-13.50
San Fran., No. 2 net	12.00-12.50
Seattle, No. 1.....	15.00
Toronto, dlrs., No. 1	11.00-11.25
Valleys, No. 1.....	21.00-21.50

Chicago	14.50-15.00
Cincinnati, dealers.	9.75-10.25
Cleveland, no alloy.	13.50-14.00
Detroit	†9.75-10.25
Eastern Pa.	15.00
Los Angeles	4.00- 5.00
New York	†9.00- 9.50
Pittsburgh	15.50-16.00
St. Louis	11.00-11.50
San Francisco	5.00
Toronto, dealers.	7.25- 7.50
Valleys	14.00-14.50

## SHOVELING TURNINGS

Buffalo	14.50-15.00
Cleveland	14.00-14.50
Chicago	14.75-15.25
Chicago, spl. anal.	15.50-16.00
Detroit	†12.00-12.50
Pitts., alloy-free.	17.00-17.50

## BORINGS AND TURNINGS

<i>For Blast Furnace Use</i>	
Boston district	†8.00- 8.25
Buffalo	14.00-14.50
Cincinnati, dealers.	8.00- 8.25
Cleveland	14.00-14.50
Eastern Pa.	13.00-13.50
Detroit	†11.50-12.00
New York	†8.75- 9.00
Pittsburgh	14.50-15.00
Toronto, dealers	7.00- 7.25

## AXLE TURNINGS

Buffalo	17.00-17.50
Boston district	†12.00-12.50
Chicago, elec. fur.	20.00-20.50
East. Pa. elec. fur.	19.50-20.00
St. Louis	13.25-13.75
Toronto	7.25- 7.50

## CAST IRON BORINGS

Birmingham	8.50
Boston dist. chem.	†9.75-10.00
Buffalo	14.00-14.50
Chicago	13.75-14.25
Cincinnati, dealers.	8.00- 8.25
Cleveland	14.00-14.50
Detroit	†11.75-12.25
E. Pa., chemical.	15.00-15.50
New York	†10.00-10.50
St. Louis	10.00-10.50
Toronto, dealers	7.25- 7.50

## RAILROAD SPECIALTIES

Chicago	23.00-23.50
---------	-------------

## ANGLE BARS—STEEL

Chicago	23.00-23.50
St. Louis	21.50-22.00

## SPRINGS

Buffalo	25.50-26.00
Chicago, coil	24.50-25.00
Chicago, leaf	23.00-23.50
Eastern Pa.	25.00-26.00
Pittsburgh	27.50-28.00
St. Louis	22.75-23.25

## STEEL RAILS, SHORT

Birmingham	19.50
Buffalo	25.50-26.00
Chicago (3 ft.)	23.00-23.50
Chicago (2 ft.)	23.75-24.25
Cincinnati, dealers.	23.75-24.25
Detroit	†23.00-23.50
Pitts., 2 ft. and less	27.00-27.50
St. L. 2 ft. & less.	23.75-24.00

## STEEL RAILS, SCRAP

Birmingham	17.00
Boston district	†16.50-17.50

Buffalo	22.50-23.00
Chicago	20.00-20.50
Cleveland	24.00-24.50
Pittsburgh	24.00-24.50
St. Louis	20.75-21.25
Seattle	18.00-18.50

## PIPE AND FLUES

Chicago, net	13.50-14.00
Cincinnati, dealers.	12.75-13.25

## RAILROAD GRATE BARS

Buffalo	14.50-15.00
Chicago, net	14.00-14.50
Cincinnati, dealers.	12.25-12.75
Eastern Pa.	18.50
New York	†12.00-12.50
St. Louis	14.00-14.50

## RAILROAD WROUGHT

Birmingham	16.00
Boston district	†9.50-10.00
Eastern Pa., No. 1.	20.00-20.50
St. Louis, No. 1.	14.50-15.00
St. Louis, No. 2.	16.75-17.25

## FORGE FLASHINGS

Boston district	†12.75-13.00
Buffalo	19.50-20.00
Cleveland	19.00-19.50
Detroit	†16.25-16.75
Pittsburgh	19.50-20.00

## FORGE SCRAP

Boston district	†7.00
Chicago, heavy	24.00-24.50

## LOW PHOSPHORUS

Cleveland, crops.	23.50-24.00
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	23.00-23.50
Cleveland	22.50-23.00
Eastern Pa.	25.00-25.50
Pittsburgh	26.50-27.00
Seattle	15.00
Detroit	†19.75-20.25

## RAILS FOR ROLLING

<i>5 feet and over</i>	
Birmingham	20.00
Boston	†18.50-19.00
Chicago	24.25-24.75
New York	†18.50-19.00
Eastern Pa.	25.00-26.00
St. Louis	22.75-23.25

## STEEL CAR AXLES

Birmingham	18.00
Boston district	†19.75-20.00
Chicago, net	24.50-25.00
Eastern Pa.	25.00-25.50
St. Louis	24.75-25.25

## LOCOMOTIVE TIRES

Chicago (cut)	23.50-24.00
St. Louis, No. 1	20.50-21.00

## SHAFTING

Boston district	†19.50-19.75
New York	†20.00-20.50

Eastern Pa.	25.00-25.50
St. Louis, 1 1/4-3 3/4"	19.50-20.00

## CAR WHEELS

Birmingham, iron..	20.00
Boston dist., iron..	†16.00-16.50
Buffalo, steel	25.50-26.00
Chicago, iron	21.25-21.75
Chicago, rolled steel	23.50-24.00
Cincin., iron deal.	20.00-20.50
Eastern Pa., iron..	22.50-23.00
Eastern Pa., steel..	25.50-26.00
Pittsburgh, iron..	22.00-22.50
Pittsburgh, steel..	27.50-28.00
St. Louis, iron	20.50-21.00
St. Louis, steel	22.25-22.75

## NO. 1 CAST SCRAP

Birmingham	17.00
Boston, No. 1 mach.	†17.25-17.50
N. Eng., del. No. 2.	17.50-18.00
N. Eng. del. textile.	20.50-21.50
Buffalo, cupola	19.00-19.50
Buffalo, mach.	20.00-20.50
Chicago, agri. net.	16.00-16.50
Chicago, auto net.	18.00-18.50
Chicago, rail'd net	17.75-18.25
Chicago, mach. net.	18.00-18.50
Cincin., mach. deal.	21.00-21.50
Cleveland, mach.	23.00-23.50
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	21.00-21.50
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	19.75-20.25
St. L., No. 1 mach.	20.50-21.00
Toronto, No. 1 mach., net dealers	18.00-18.50

## HEAVY CAST

Boston dist. break.	†17.50-18.00
New England, del.	17.00-17.50
Buffalo, break	18.00-18.50
Cleveland, break, net.	16.50-17.00
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	13.00-13.50
Cincinnati, dealers.	12.75-13.25
Detroit, net	†11.50-12.00
Eastern Pa.	18.50
New York fdry	†13.50
St. Louis	14.50-15.00
Toronto dealers, net	12.00

## MALLEABLE

New England, del.	22.00-23.00
Buffalo	22.50-23.00
Chicago, R. R.	23.75-24.25
Cincin. agri., deal.	18.25-18.75
Cleveland, rail	24.00-24.50
Eastern Pa., R. R.	22.50-23.00
Los Angeles	12.50
Pittsburgh, rail..	25.00-25.50
St. Louis, R. R.	21.00-21.50

## Ores

<b>Lake Superior Iron Ore</b>	
<i>Gross ton, 51 1/2 %</i>	
<i>Lower Lake Ports</i>	
Old range bessemer	4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

<b>Eastern Local Ore</b>	
<i>Cents, unit, del. E. Pa.</i>	
Foundry and basic	56-63% contract. 10.00
<b>Foreign Ore</b>	
<i>Cents per unit, c.i.f. Atlantic ports</i>	
Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos	Nom.

<b>Spanish, No. African</b>	
<i>basic, 50 to 60% nom.</i>	
Chinese wolframite, net ton, duty pd.	\$23.50-24.00
Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c
<b>F.O.B. Rio Janeiro.</b>	
Scheelite, imp.	\$25.00
Chrome ore, Indian, 48% gross ton, c.i.f.	\$28.00-30.00

<b>Manganese Ore</b>	
<i>Including war risk but not duty, cents per unit cargo lots.</i>	
Caucasian, 50-52%	54.00-55.00
So. African, 50-52%	54.00
Indian, 49-50%	50.00
Brazilian, 46%	50.00
Cuban, 50-51%, duty free	67.50
<b>Molybdenum</b>	
Sulphide conc., lb., Mo. cont., mines	50.75



# Sheets, Strip

Sheet & Strip Prices, Pages 94, 95

**Pittsburgh**—Sheet deliveries are well in hand, although bookings over the past week have been heavier than most of the preceding weeks. Price announcement for first quarter will probably be delayed until the last practical moment. Most interests here expect reaffirmation. Miscellaneous buying has been heavy, principally for inventory, and this movement is expected to continue until the end of the year. After that there may be a leveling off, with releases meeting the actual consumption rate. Galvanized sheet production is up 1 point to 82 per cent of capacity, with general sheet production at the same level.

**Cleveland**—Cold-rolled sheets and strip enjoy the best demand for some makers turning out a wide range of steel items. Business increases in volume constantly and deliveries slip behind a little each week. The best shipment on hot-rolled sheets is February or March for some producers, an item which a month ago was booked only four weeks ahead.

**Chicago**—Demand for flat-rolled products moderated somewhat during the week, consumers having estimated their future requirements closely and placing orders against them. This comes as a relief to mills which have heavy backlogs for sheets and strip. Automotive and household equipment requirements continue heavy.

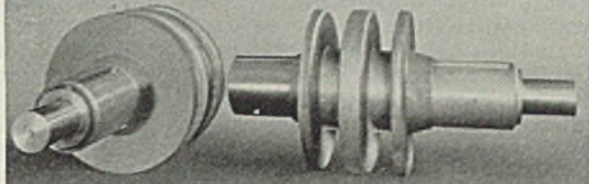
**Boston**—Priorities are appearing with some orders for stainless steel strip for aircraft and pressure for deliveries continues. Incoming volume tops shipments with backlog mounting despite high production. While consumption of narrow cold strip is heavier, consumer inventories are growing.

**New York**—Following relative steadiness, sheet deliveries are again expanding, hot-rolled being five to eight weeks, cold-rolled six to nine weeks and galvanized five to seven weeks. In rare cases galvanized can be had in three weeks where available from mill stocks. Electrical sheets are offered in five to eight weeks and annealing sheets six to eight weeks.

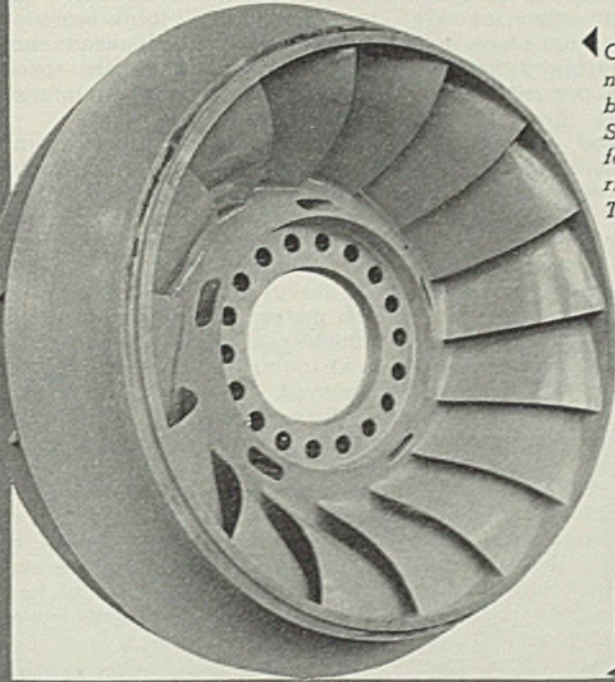
Mill backlogs of narrow cold strip are growing with bookings greater than shipments. Consumption is heavier and most tonnage is going directly into consumption.

**Philadelphia**—Heavy bookings the past few weeks have absorbed producing capacity through December. Mills usually ask six to eight weeks for shipment of hot-rolled sheets and slightly more on the average for cold-rolled. Galvanized demand has been aided somewhat

Forged carbon  
steel sprocket  
shaft produced  
by Standard.  
Diameter 2'  
11"; length 5'  
11¼"; weight  
5160 pounds.



Cast steel runner  
supplied  
by Standard  
Steel Works  
for an I.P. Morris  
Hydraulic  
Turbine.



## LET *Standard* HELP WITH YOUR STEEL FORGING AND CASTING PROBLEMS

If your productive capacity calls for a dependable source of supply for steel forgings and castings of unusual design—try Standard.

Good steel, long experience and close control of every step in manufacture, from open-hearth to finished product, assure the satisfactory quality of Standard's forgings and castings.

Won't you discuss your requirements with us and let us advise you how Standard can help?

CASTINGS • FORGINGS • WELDLESS RINGS • WROUGHT STEEL WHEELS

### STANDARD STEEL WORKS

Division of THE BALDWIN LOCOMOTIVE WORKS  
P H I L A D E L P H I A



by fear prices would be advanced next quarter to compensate for higher spelter costs, although deliveries are the main consideration in forward contracting.

**Buffalo**—With consumers pressing for stock the sheet and strip steel market has a tighter delivery problem to cope with than was in evidence earlier in the month. Considerable tonnage has been placed for first quarter delivery, although books are not formally opened.

**Cincinnati**—Sheet mill backlogs are growing and deliveries are lengthened. Estimates place tonnage definitely bearing a national defense label at 15 per cent of the total. Interest in first quarter needs has increased, considerable tonnage having been already accepted although books are not formally open.

**St. Louis**—Producers of sheets and strip report orders running ahead of current output, and backlogs have increased notably since the end of October. Fabricators of commodities for the defense program and civilian requirements have increased buying, and material for these purposes is increasingly tight, with deliveries on some items deferred well into next year.

**Birmingham, Ala.**—While sheets have fluctuated somewhat in volume of tonnage, due, it is believed, to advent of extremely cold weather, aggregate bookings remain highly satisfactory in both roofing and manufacturers' sheets. Production at close to 85 per cent.

**Toronto, Ont.**—Demand for sheets is increasing and Canadian mills now are heavily committed into 1941. It is stated that war demand, exclusive of the automotive industry, absorbs the greater part of Canadian sheet output and several large new plants are under construction which will greatly augment present consumption.

## Plates

Plate Prices, Page 94

**Pittsburgh**—Buying continues heavy with deliveries running far behind. Priorities on material placed by various service branches of the government will be arbitrated by the new five-man board. Tonnage coming from private sources as yet will have no priority.

**Cleveland**—A large producer finds plates lead in scarcity and belated delivery. Demand still increases and promises to continue. With all available lake vessels carrying ore recently there is talk of further shipbuilding.

**Chicago**—Unprecedented activity of heavy construction industries, including builders of boilers and tanks, and fabricators of special ma-

chinery, cranes, materials handling equipment, and the like, is sustaining demand for steel plates. Mills have heavy backlogs and extended deliveries, and warehouses feel the effect of the tight situation through increased sales.

**New York**—Plate deliveries vary widely, with universal available within three to four weeks and sheared plates from five to ten weeks. Little can be had on widths over 85 inches before eight or ten weeks. Demand is active and diversified, with tank and boiler shops well booked ahead and railroad equipment makers specifying heavily for railroad equipment and armament.

**Philadelphia**—Releases from shipbuilders are heavier. However, it will be several months before the peak is reached in plate shipments to yards, since several shipways are not yet ready for service. January delivery generally is being quoted on plates, particularly on wider and thicker sizes. Mill backlogs still are expanding, with deliveries further delayed.

**Birmingham, Ala.**—Backlogs in plates continue upward and mills are considerably behind on delivery. In some cases, delivery is not probable until after the first of the year at the earliest, with a tendency to advance the date even beyond that. Car production and shipbuilding are responsible for most of the tonnage.

**Seattle**—Shipbuilding and general construction have raised demand for plates above the best for ten years. Fabricating shops, for the first time in several years, have backlogs. Steel Tank & Pipe Co., Portland, has 3000 tons involved in ore pots and bins for the Aluminum Co. of America plant at Vancouver, Wash., and 2000 tons for similar equipment has been taken by Puget Sound Machinery Depot, Seattle.

**San Francisco**—Awards of plates included 540 tons for submarine tenders, two of which will be built at the Mare Island, Calif., navy yard and one at the Puget Sound navy yard, Bremerton, Wash. Steel Tank & Pipe Co. took 282 tons for a dredger hull. Awards aggregated 2822 tons and brought the total to date to 186,733 tons as compared with 90,326 tons for the corresponding period in 1939.

**Toronto, Ont.**—Present indications point to plate buying on a much broader scale. During the past week eight vessels were launched in Canadian shipyards and new keels are to be laid immediately for which plates will be required. As no plate is available in Canada from domestic production for an indefinite period, most of the new business is expected to go to United States producers.

## Plate Contracts Placed

3000 tons, including shapes, ore bins and pots for Vancouver, Wash., plant of Aluminum Co. of America, to Steel Tank & Pipe Co., Portland, Ore.

2000 tons, including shapes, ore pots and cradles for Vancouver, Wash., plant of Aluminum Co. of America, to Puget Sound Machinery Depot, Seattle.

1200 tons, including shapes, United States survey steamer, to Bethlehem Steel Co.; Lake Washington Shipyards, Seattle, general contractor.

400 tons, water storage tank, army airfield, Anchorage, Alaska, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

360 tons, two submarine tenders for navy to Mare Island, Calif., navy yard.

282 tons, dredger hull, Yuba Mfg. Co., San Francisco, to Steel Tank & Pipe Co., Berkeley, Calif.

200 tons, caisson for United States engineer, Bonneville dam, to Puget Sound Machinery Depot, Seattle.

180 tons, submarine tender for navy to Puget Sound navy yard, Bremerton, Wash.

Unstated tonnage, one 500,000-gallon and one 50,000-gallon, steel tank, Fort Bliss, Texas, to Chicago Bridge & Iron Co., Chicago, \$47,500; bids Nov. 7, constructing quartermaster, inv. 6289-2.

## Bars

Bar Prices, Page 94

**Pittsburgh**—Some bar mill capacity remains open, although its availability is secondary to the fact that bar mills have been hard put to get enough steel to keep busy. Backlogs run fairly high. Diversion of semifinished tonnage to other products has kept the quota of steel for bar mills down so that output is around 80 per cent, compared with more than capacity output in other districts. Inventories good at both warehouses and consuming plants.

**Cleveland**—Bars are usually sold up for the rest of the year and are among three or four items most behind on delivery. Demand is varied as is characteristic, with many small orders rather than few large. Rail steel bars have been advanced \$2 per ton, to a parity with billet bars, now being quoted at 2.15c, mill, at all producing centers, delivered prices being up the same amount. One important producer of this grade has withdrawn from the market.

**Chicago**—Merchant bars are in best demand of all steel products. Orders are increasing slightly and mill backlogs are growing, necessitating longer deliveries. Considerable first-quarter business is being put on books. Alloy bars are in the tightest situation.

**Boston**—Upward trend in consumption tends to bring out more spot orders for bar tonnage, alloys and specialty stock on which buyers are unable to place advance protective specifications and on which pressure for shipment continues

against lengthening mill deliveries. Situation is also complicated by releases by warehouses and direct secondary distributors seeking to keep inventories in balance. Demand for specialties entering into machine tool building and defense work is mounting, enhanced by protective inquiry on the part of suppliers for regular civilian needs.

**New York**—Under pressure of increasing demand, bars have been booked virtually solid for this year. Certain small rounds and flats can yet be had and certain larger sized rounds can be picked up for this year. Cold-drawn carbon bars are a little tighter and in alloys shipments are far more extended. On an average, hot and cold alloy bars are available within 15 to 16 weeks.

**Philadelphia**—Mills find few openings in rolling schedules to insert additional tonnage for delivery before January, the large bulk of recent orders being for first quarter shipment or later. Forward buying is more extended, and specifications covering first quarter blanket orders are increasing.

**Birmingham, Ala.** — Mills are comfortably booked on merchant and reinforcing bars. Output remains consistently high at 80 per cent or better, due to an aggregate of relatively small individual orders.

**Buffalo** — Mills are having difficulty avoiding still further lengthening in delivery as consumers press for tonnage for immediate use and inventory. Opening of Bethlehem's new mill, which will work on a triple shift, is expected to ease the delivery situation. In addition to heavy domestic demands, local mills are receiving an increased volume of Canadian orders.

**Toronto, Ont.** — Merchant bar sales are growing in volume, with some recent purchases made in Buffalo to augment supply for quick delivery. Canadian producers report backlogs into first quarter, with all output for this year absorbed. Building trades and manufacturers are calling more extensively for supplies and orders generally involve larger tonnages than formerly.

## Ferroalloys

Ferroalloy Prices, Page 96

**New York**—Although ferroalloy prices were reaffirmed earlier in the month for first quarter, ferroalloy shipments in November will be exceptionally heavy. Stocks laid in against the \$20 advance on contracts July 1 have been well worked off and this, combined with the all-time high record in ingot production, is resulting in a heavy movement.

## Pipe

Pipe Prices, Page 95

**Pittsburgh**—Production is still at virtual capacity on standard pipe. Demand is fairly heavy for pressure tubing, but the lull continues in oil country goods, both line pipe and casing. Deliveries in alloy tubing show no improvement. Mechanical tubing releases have been fairly active.

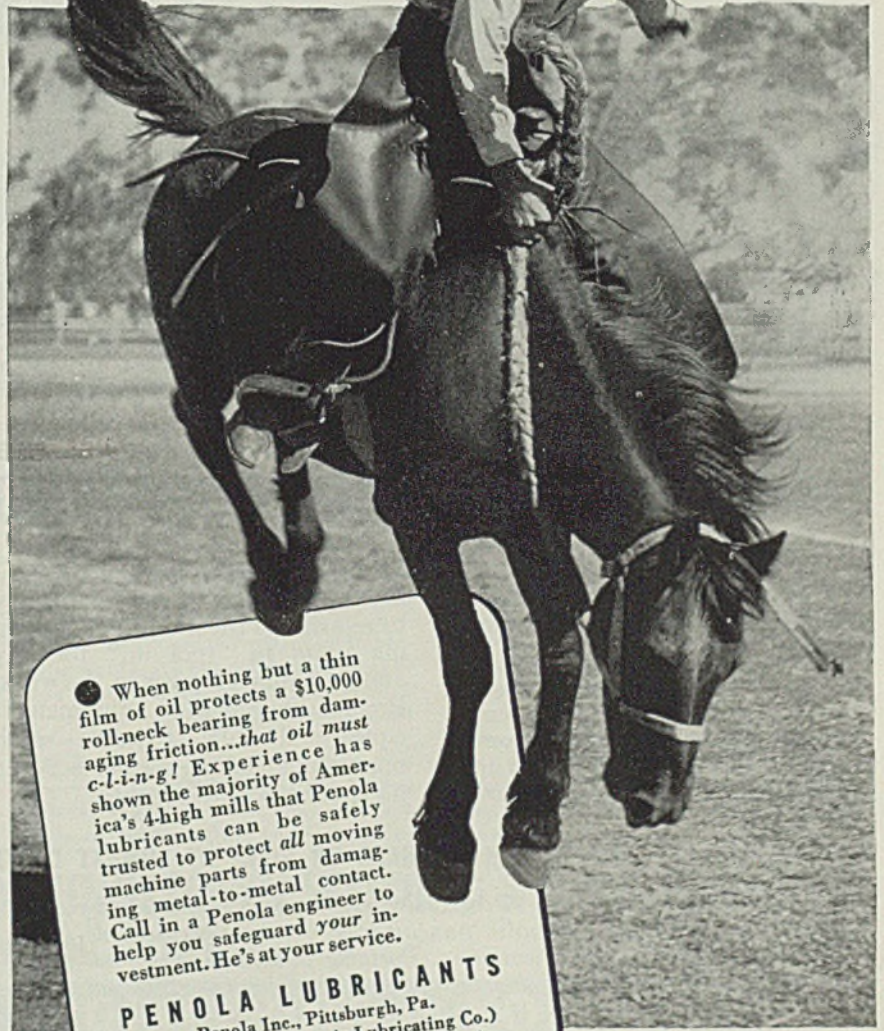
**Cleveland**—Line pipe, which had been comparatively slow, has improved, with best delivery early February. Casings, which had been

dragging, are now in good demand for the season. Merchant pipe is in best demand, with volume increasing and deliveries deteriorating. An important heating equipment maker, who uses much pipe, has an inquiry for outfitting three large army camps, which, if awarded, will keep him fully occupied on that order alone for six months.

**New York**—While normally the fall peak in merchant pipe comes in October, leading sellers claim they have seen little decline this month. Miscellaneous construction requirements have been heavy, with a disposition to get as much work accomplished as the weather will

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permit. The resale market is still unsettled, but there is a stronger undertone.

**Birmingham, Ala.**—Cast iron pipe production has shown a noteworthy increase in the past two to three weeks. Government contracts for army and naval bases are responsible for considerable of the tonnage. Most of it is in relatively small lots, while municipal buying, largely on the west coast, continues at a gratifying pace. Operations are expected to return to a six-day week next week.

**Seattle**—Demand is strongly upward as army and navy projects round into shape. Cities in this

area are also planning improvements for next year. About 1000 tons of pipe are pending, general contracts placed.

**San Francisco**—American Cast Iron Pipe Co. took 425 tons of various sizes of cast iron pipe, schedule 4385, for the Panama Canal. United States Pipe & Foundry Co. booked 130 tons of 6-inch pipe for Sacramento, Calif. Awards aggregated 1018 tons and brought the total to date to 43,403 tons as compared with 35,400 tons for the corresponding period in 1939.

### Cast Pipe Placed

550 tons, various sizes, Fort Lewis,

Wash., cantonment, to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.  
325 tons, cement lined, various sizes, Panama, schedule 4483, to United States Pipe & Foundry Co., Burlington, N. J.

### Cast Pipe Pending

300 tons, 4-inch, cast iron soil pipe, Panama, schedule 4519, bids Nov. 26, Washington.

## Rails, Cars

Track Material Prices, Page 95

Railroad buying is led by placing of 75,000 tons of rails by the Pennsylvania, one of the largest lots awarded this fall. Scattered buying of cars and locomotives continues, though a heavy inquiry for cars is pending. Car builders are able to take on a large number of cars for this winter's production.

Chicago, Burlington & Quincy has ordered ten diesel-powered air conditioned buses for its subsidiary, Burlington Trailways, making a total of 50 such vehicles in service.

### Car Orders Placed

Bessemer & Lake Erie, 1000 freight cars as follows: 650 hopper-type, to Pullman-Standard Car Mfg. Co.; 300 box cars, to Greenville Steel Car Co.; 50 flat cars, to Magor Car Corp.

Hooker Electrochemical Co., Niagara Falls, N. Y., five 40-ton tank cars, to General American Transportation Corp., Chicago.

Louisville & Nashville, 1600 hoppers, 100 end-door automobile cars, 50 gondolas, to Pullman-Standard Car Mfg. Co., Bessemer, Ala., plant; 1400 fifty-ton hopper cars to American Car & Foundry Co., New York.

Montsanto Chemical Co., St. Louis, six 50-ton and three 40-ton tank cars, to General American Transportation Corp., Chicago.

Seaboard Air Line, 500 allsteel box cars, to Pullman-Standard Car Mfg. Co., Birmingham, Ala.

Wilson Car Lines, 200 refrigerator cars, to its own shops in Chicago; these are in addition to 200 thirty-five-ton refrigerator cars recently completed.

U. S. Army, four 40-foot flat cars, to Haffner-Thrall Car Co., Chicago.

U. S. Army, 20 box cars, to General American Transportation Co., Chicago.

U. S. Navy, 14 cars, including six 50-ton gondolas for Norfolk, Va., and five 50-ton flat and three 50-ton box cars for Philadelphia, to the Haffner-Thrall Car Co., Chicago.

### Rail Orders Placed

Central Railroad of New Jersey, 4500 tons, to Bethlehem Steel Co., Bethlehem, Pa.

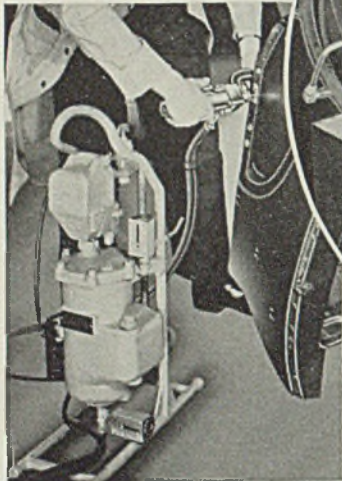
Gulf Coast Lines, 2834 tons, plus accessories, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Pennsylvania, 75,000 tons; 37,500 tons to Carnegie-Illinois Steel Corp., Pittsburgh, 33,000 tons to Bethlehem Steel Co., Bethlehem, Pa., 4500 tons to Inland Steel Co., Chicago.

### Locomotives Placed

Bessemer & Lake Erie, five Texas-type,

... without  
**PRESSES**  
or costly  
**CAM DIES**



Radial mounting of individual hydraulic units to punch 16 holes in 1/8th stock. These units could be mounted at any angle as required. *At left:* Portable air-hydraulic unit used for punching—low production jobs—or repair work.

## Production PUNCHING • SHEARING

Progressive Hydraulic Punching and Shearing Equipment eliminates both presses and costly cam dies.

Any number of individual hydraulic units required—each mounting one or more punches can be placed and spaced to punch any number of holes—*simultaneously*.

With Progressive Hydraulic punching equipment it is only necessary to re-arrange the individual punching units to "tool up" for any annual design changes in the work. Progressive Shearing equipment is equally flexible, requires minimum floor space—no presses and no special skill to operate.

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# PROGRESSIVE WELDER CO.

3031 EAST OUTER DRIVE, DETROIT

large locomotives, to the Baldwin Locomotive Works; and two eight-wheel switching engines, to the American Locomotive Co.

Florida East Coast, one 2000-horsepower diesel-electric locomotive, to Electro-motive Corp., La Grange, Ill.

Wyandotte Terminal, one 300-horsepower diesel-electric switch engine, to General Electric Co., Schenectady, N. Y.

### Locomotives Pending

Seaboard Air Line, two 600-horsepower diesel electric switch engines, bids asked.

### Buses Booked

A.e.f. Motors Co., New York: Sixteen 37-passenger coaches and ten 33-passenger coaches for Southeastern Greyhound Lines, Lexington, Ky.

Twin Coach Co., Kent, O.: Ten 27-passenger for Nashville Coach Co., Nashville, Tenn.; ten 44-passenger for Surface Transportation Corp., New York; thirteen 41-passenger for United Electric Railways Co., Providence, R. I.; five 27 passenger and three 35-passenger for Georgia Power Co., Atlanta, Ga.; five 31-passenger for Rochester Transit Corp., Rochester, N. Y.; four 27-passenger for South Carolina Power Co., Charleston, S. C.; two 29-passenger for Belleville-St. Louis Coach Co., Belleville, Ill.

### Wire

Wire Prices, Page 95

**Pittsburgh** — Shortage of wire rods has kept district mills at less than capacity in spite of the fact that deliveries are running behind and heavy backlogs are being built up. There has been a rush of buyers in the past few weeks to get on the books in order to bolster inventory positions, as well as a new wave of export buying.

**Cleveland**—Commodity strip and rods are usually booked solid for the rest of the year. Nails are in especially good demand for construction work connected with defense. On wire rope one producer recently made a delivery within 48 hours, which is counter to the general rule. Farm demand for fencing is expected to set in earlier than the usual March date, because of possible shortages.

**Chicago**—Wire sales are strong and inquiries heavy. Order books are filled for weeks ahead, and deliveries are slowing up. A brake to production is inability to obtain sufficient semifinished material for processing, in the face of the existing strain on ingot-making facilities.

**Boston**—Wire mills operating at high pace on hand-to-mouth basis as to rod supplies, especially on selected and special analysis grades. Incoming tonnage is unabated and ahead of shipments. Mills are sold out for the rest of 1940 on more products and more is being booked for first quarter at open prices. Defense requirements mount and pressure for shipments by the automo-

tive trade, notably parts makers, is intense.

**New York**—In addition to growing tonnage for first quarter considerable undelivered fourth quarter wire will be carried over. Backlogs will start the year heavy. All electrical cable production is fully engaged on government work for several months. Pressure on rope and rod mills is heavy and deliveries are lengthening.

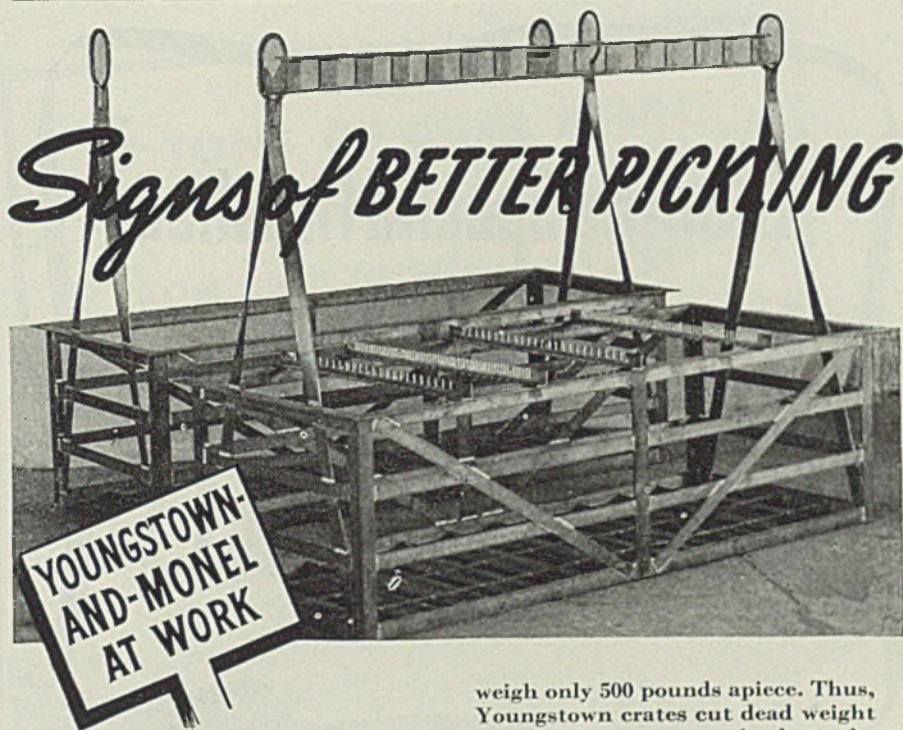
**Birmingham, Ala.** — Wire items are in consistently good demand, with considerable backlogs accumulated. Some pressure is evident for delivery, particularly in manufacturers' wire items.

## Shapes

Structural Shape Prices, Page 94

**Pittsburgh**—Some interests here believe the end of the bulge in structural buying is in sight. Most new construction and plant expansion programs have been booked and during the first quarter there should be a leveling off as these projects approach completion. Meanwhile, deliveries are running far behind.

**Cleveland**—Three or four attractive tonnages have been placed, with many projects still on drawing boards. Deliveries are further de-



The Youngstown Monel crates above are used to pickle sheets for enameled signs and store fronts. Such sheets must be pickled perfectly—Monel eliminates any possible danger of "copper-flash" that might interfere with enameling operations. Monel, because of its great resistance to pickling acids, its strength and toughness is the sign for longer life—with fewer repairs—in pickling equipment generally.

And the sign for better crate construction is YOUNGSTOWN. These light-weight welded crates carry loads of 2000 pounds each, yet they

weigh only 500 pounds apiece. Thus, Youngstown crates cut dead weight to a minimum, up payloads to the maximum, with greater efficiency and safety than is possible with more cumbersome crates made of less rugged metals.

We are specialists in the manufacture of pickling crates—we have the engineers to design a job exactly to your plant conditions, and the experienced welders and machinists, the plant facilities to execute these designs—promptly. Now that production schedules are heavy, why not bring your pickling department to its peak efficiency with YOUNGSTOWN welded Monel crates? We'd gladly quote on those best suited to your needs.

**YOUNGSTOWN WELDING & ENGINEERING CO.**  
**YOUNGSTOWN OHIO**

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**LONG LIFE by MONEL**

layed, though are still prompt by comparison with nine to ten months during the World war. Structural are among the three or four most delayed steel items. With 4000 tons of concrete bars awarded for the Ravenna, O., munition works, structural inquiries are expected soon. The Cleveland Federal Reserve bank has set up machinery for advising small manufacturers details of securing government contracts, which may cause placing of structurals for new plants and additions.

**Chicago** — Structural fabricators are fully engaged for weeks ahead and welcome a brief lull in inquiries. Some difficulty is experienced in

getting mill deliveries on standard shapes, because of congested rolling schedules.

**Boston**—Bids close Dec. 24 on the Thames river high level bridge, New London, Conn., approximately 20,000 tons, the largest structural project in New England this year. Current contracts have slackened but a fair volume is on boards for estimates. Most structural inquiry is still indirectly connected with defense, a forging shop having estimates up for its fourth addition this year, taking several hundred tons.

**New York**—Pending structural requirements for elevated highway sections, approaches in connection

with the Battery-Brooklyn tunnel, the first closing Nov. 29, approximate 13,500 tons. New awards and inquiry are substantially lower, delay in plants retarding defense work.

**Philadelphia**—Some producers are naming eight weeks as minimum delivery for standard shapes, although occasional orders are being worked in on shorter time. Considerable tonnage of fabricated material is pending, and inquiries continue heavy. Awards lately have been confined to small lots.

**Seattle**—Fabricators have backlogs for 60 to 90 days, and some have withdrawn from bidding until the end of the year. Delayed deliveries from some Eastern plants are reported. Seattle-Tacoma Shipbuilding Co., Seattle, is expected to place contracts for steel required for 20 destroyers, within the coming fortnight, tonnage unstated. Pittsburgh-Des Moines Steel Co. will fabricate 1000 tons for the reclamation bureau Great Northern railroad bridge at Kettle Falls, Wash.

**San Francisco**—A fair volume of structurals was placed and totaled 4682 tons. Unnamed interests were awarded 4000 tons for an engineering shop at Hickam Field, T. H. The Mare Island navy yard, California, will build two submarine tenders requiring 240 tons and the Puget Sound navy yard, Bremerton, Wash., one calling for 120 tons.

**Toronto, Ont.**—Government war production projects are creating heavy demand for structural steel and several large orders are pending for immediate closing. Among the more important are 5000 tons for the government shell filling plant near Pickering, and a second government order for 4000 tons for new airplane plant at London. Most of the larger contracts are being spread among various firms for more speedy delivery.

### Shape Contracts Placed

4000 tons, engineering shop, invitation 6812-41-7, Hickam Field, T. H., placed with unnamed interest through general contractor Robt. E. McKee, 4700 San Fernando boulevard, Los Angeles.  
1200 tons, building, Cincinnati Milling Machine Co., Cincinnati, to Pitts-

### Shape Awards Compared

	Tons
Week ended Nov. 23	11,377
Week ended Nov. 16	29,373
Week ended Nov. 9	28,000
This week, 1939	24,235
Weekly average, year, 1940	28,022
Weekly average, 1939	22,411
Weekly average, Oct.	48,298
Total to date, 1939	1,067,900
Total to date, 1940	1,317,506

Includes awards of 100 tons or more.

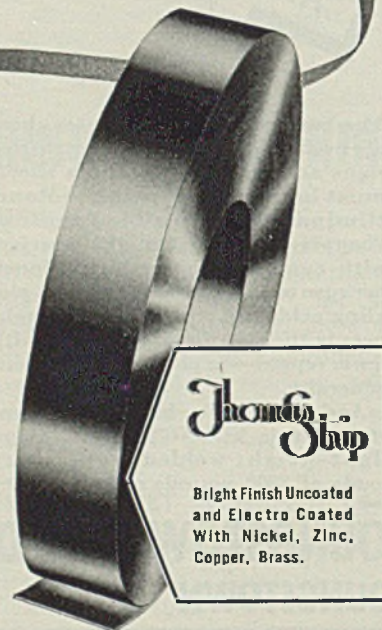
# Thomas Special Finishes

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STRIP STEEL

The finish on cold rolled strip steel is invariably a very important factor and in this respect Thomas is achieving unexcelled results. Thomas electro coated finishes are economically supplied to many manufacturers. The excellent qualities of the coatings frequently eliminate further finishing. They are dependable, and will not crack nor peel during deep drawing and forming operations. . . Let one of our representatives explain how Thomas electro coatings may lower your production costs.



**THE THOMAS STEEL CO.**  
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL  
WARREN, OHIO

burgh-Des Moines Steel Co., Pittsburgh.  
 1000 tons, building, Ohio Crankshaft Co., Cleveland, to Burger Iron Co., Akron, O.  
 1000 tons, reclamation bureau bridge, Kettle Falls, Wash., to Pittsburgh-Des Moines Steel Co., Pittsburgh.  
 700 tons, aviation facilities, naval reserve base, Atlanta, Ga., to Calvert Iron Works, Atlanta; Mlom Construction Co., Atlanta, contractor.  
 450 tons, six-story apartment, Riverside drive-158th and 161st streets, New York, to Dreier Structural Steel Co. Inc., New York.  
 400 tons, alterations, craneways, navy yard, Philadelphia, to American Bridge Co., Pittsburgh.  
 325 tons, administration building, Frankford, Pa., arsenal, to Bethlehem Steel Co., Bethlehem, Pa.  
 325 tons, power house, Hercules Powder Co., Parlin, N. J., to American Bridge Co., Pittsburgh.  
 270 tons, belt parkway overpass, contract E 6, Brooklyn, to American Bridge Co., Pittsburgh, through E. G. Larson Contracting Co.  
 260 tons, office building, Colts Patent Fire Arms Mfg. Co., Hartford, Conn., to Belmont Iron Works, Philadelphia, through A. F. Peaslee Inc., Hartford, Conn.  
 240 tons, two submarine tenders for navy to Mare Island, Calif., navy yard.  
 200 tons, cranes, navy, use in Hawaii, to Fort Pitt Bridge Works, Pittsburgh.  
 200 tons, steel piling, bulkhead, Flambeau Paper Co., Park Falls, Wis., C. R. Meyer & Son, contractor, used sections, to L. B. Foster.  
 188 tons, dredger hull for Yuba Mfg. Co., San Francisco, to Steel Tank & Pipe Co., Berkeley, Calif.  
 175 tons, dormitory addition, naval academy, Annapolis, to Frank M. Weaver Co., Lansdale, Pa., through Henry W. Hurst Co., Philadelphia.  
 124 tons, addition building No. 55, Frankford arsenal, to Frank M. Weaver Co., Lansdale, Pa., through Henry W. Hurst Co., Philadelphia.  
 120 tons, submarine tender for navy, to Puget Sound navy yard, Bremerton, Wash.  
 100 tons, equipment building, Puget Sound navy yard, to Pacific Car & Foundry Co., Seattle; Mowat Construction Co., Seattle, general contractor.  
 100 tons, factory building for manufacture of metal searchlight mirrors, Cincinnati, to Indiana Bridge Co. Inc., Muncie, Ind.; Ferro Concrete Construction Co., Cincinnati, contractor.

### Shape Contracts Pending

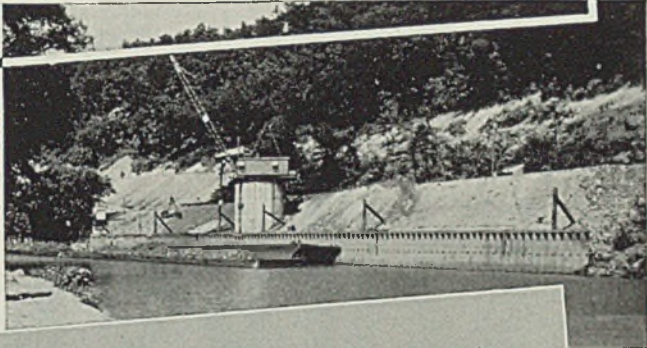
8500 tons, two additional sections, Brooklyn approach, elevated highway, Battery-Brooklyn tunnel, New York; bids about Dec. 15; in addition to 5000 tons for two sections closing Nov. 29.  
 4000 tons, assembly shop, specification 10172, Hunters Point drydock, San Francisco; bids in.  
 1700 tons, shop building, navy, Boston.  
 1500 tons, building, Lima Locomotive Works, Lima, O.  
 1300 tons, warehouse building, Sears, Roebuck & Co., Cleveland.  
 1200 tons, process plant, Jefferson Island Salt Mining Co., Jefferson Island, La.  
 1140 tons, 17 buildings, shell loading plant, Ravenna, O.  
 1000 tons, airplane factory, Goodyear Tire & Rubber Co., Akron, O.  
 800 tons, plant building, Westinghouse Electric & Mfg. Co., Cleveland; Austin Co., Cleveland, builder; award imminent.  
 700 tons, contract 4, construction shaft, Brooklyn tunnel, New York, for New York City tunnel authority.  
 650 tons, turret shop, New York Ship-

building Corp., Camden, N. J.  
 550 tons, dunnage for bomb storage, Arsenal, Utah, for government.  
 400 tons, trashracks, Parker power plant, 1453-D. Earp, Calif., for bureau of reclamation.  
 375 tons, intake gates, Watts Bar project, Spring City, Tenn., for Tennessee Valley authority.  
 300 tons, manufacturing building, Irvington Smelting & Refining Works, Irvington, N. J.  
 275 tons, mental defective school, Willowbrook, N. Y., for state.  
 250 tons, addition to Lake Forest hospital, Lake Forest, Ill., bids Nov. 25.  
 250 tons, building, Westinghouse Electric & Mfg. Co., Cleveland, H. K. Ferguson Co., Cleveland, builder.  
 230 tons, building, Air Preheater Corp., Wellsville, N. Y.  
 220 tons, power house, Kings county hos-

pital, Brooklyn, N. Y.  
 205 tons, engine test building, Ford Motor Co., Dearborn, Mich.  
 200 tons, bridge 552, West Salem, Wis., for state.  
 183 tons, transportation building, Puget Sound navy yard; bids in.  
 175 tons, landplane hangar No. 1 and shops, Baltimore.  
 160 tons, material for reverberatory furnace, Phelps Dodge Corp., Douglas, Ariz.  
 155 tons, coal bunker, Long Island Lighting Co., Glenn Head, N. Y.  
 125 tons, addition to South Chicago Community hospital, Chicago, bids Nov. 14.  
 120 tons, wind tunnel power building, Dayton, O., for war department.  
 100 tons, building, General Electric Co., Cleveland.  
 Unstated, two 20-ton electric traveling

## 5 TONS OF COAL EVERY 32 SECONDS!

FROM SHIP TO SHORE BY **DRAVO**



- The Pittsburgh Coal Company's Smith Ferry Dock has ample barge accommodations to insure uninterrupted operation. A Dravo whirler mounted on the shore swings a five ton bucket from ship to shore and back to ship again in 32 seconds, which is moving coal in a hurry, as any dockman will say. A fast, simple, effective rig, it enables the Pittsburgh Coal Company's Smith Ferry Dock to enjoy an unusually low handling cost per ton.
- Whether the problem is one of modernizing old equipment, replacing obsolete handling machines or designing special facilities to meet new problems, consultation with Dravo may prove to be of great value to you. Added to its ability to design, fabricate and erect structures such as shown here, Dravo Corporation has had years of experience building docks, retaining walls, plant foundations—everything that enters into the problems of terminal facilities.
- Bulletin 403 describes docks, mill foundations and terminal equipment. Bulletin 202 describes revolving cranes. Either will be sent upon request. Inquiries relative to specific problems may be addressed to

# DRAVO CORPORATION

## ENGINEERING WORKS DIVISION

SHIPYARDS: PITTSBURGH, PA.—WILMINGTON, DEL.  
 GENERAL OFFICES AND SHOPS: NEVILLE ISLAND—PITTSBURGH, PA.

job cranes for Puget Sound navy yard; bids at Washington soon.  
 Unstated, 7500 feet steel sheet piling, Washington state highway project; bids in at Olympia.  
 Unstated, bridge to span slide above Coulee dam; bids soon to reclamation bureau.  
 Unstated, bridge cranes, Puget Sound navy yard; Harnischfeger Corp., Milwaukee, and Euclid Crane & Holst Co., Euclid, O., low.

forcing bar interests and most involve small tonnages.

**Pittsburgh**—Heavy tonnage pending in the rail bar market will probably prove a good test of ability of sellers to maintain rail bar prices at 2.15c. New billet steel is firm at that level, except in a few cases involving sales less than 100 tons, principally in the jobber market.

**Cleveland** — The largest job in months involves 4000 tons for foundation work at the Ravenna, O., munition works, let to Patterson-Leitch. Prices of bars are firmer. Inquiries for 100 tons or more are rather light, though it is certain that fall

and winter demand will continue active on the whole.

**Boston**—Revised plans for the naval air station at Quonset Point, R. I., will reduce reinforcing bar requirements from an estimated 10,000 tons to approximately 6500 tons, of which close to 4000 tons has been delivered by Jones & Laughlin Steel Corp., Pittsburgh, supplying the material to contractors. Concrete bar deliveries range from four to six weeks with distributors' stocks considerably lowered.

**New York**—Except for housing projects, several thousand tons being required for Hartford, Conn., construction, reinforcing steel activity has slowed down. Stocks with secondary distributors, having been lowered substantially, pressure for deliveries is being met more freely. Relatively little mesh for highway construction is being carried over into next year.

**Seattle**—Rolling mills are on capacity schedules with heavy backlogs. Awards of small tonnages are numerous and make an imposing total. Merchant bars are in good demand for the jobbing trade and general construction. Largest job pending will probably total 1000 tons for a 1400-foot pier at Puget Sound navy yard, cost-plus contract awarded to Puget Sound Bridge & Dredging Co. and Rumsey & Co., Seattle.

**San Francisco**—The most active market of the week was that for reinforcing bars and 4817 tons were placed. Truscon Steel Co. secured 275 tons for a naval reserve armory at Olympia, Wash. Gilmore Fabricators Inc., booked 118 tons for a laboratory for a wind tunnel at Moffett Field, Calif.

## Reinforcing

Reinforcing Bar Prices, Page 95

**Chicago** — Few new construction jobs are out for figuring by rein-

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IN THE CENTER OF MID-TOWN NEW YORK

### Reinforcing Steel Awards

4000 tons, foundations and walls, shell loading plant, Ravenna, O., to Patterson-Leitch Co., Cleveland.

2000 tons, additional tonnage, naval air station, Guantanamo Bay, Cuba, to Jones & Laughlin Steel Corp., Pittsburgh; Frederick Snare Corp., New York, contractor.

1625 tons, aircraft plant, Curtiss Wright Corp., Buffalo district, to Bethlehem Steel Co., Bethlehem, Pa., through John W. Cowper Co. Inc., Buffalo.

### Concrete Bars Compared

	Tons
Week ended Nov. 23	13,792
Week ended Nov. 16	8,780
Week ended Nov. 9	6,344
This week, 1939	1,847
Weekly average, year 1940	9,691
Weekly average, 1939	9,197
Weekly average, Oct.	12,417
Total to date, 1939	455,012
Total to date, 1940	455,462

Includes awards of 100 tons or more.



# < < HELPFUL LITERATURE > >

## 1. Casting Cleaning

Hydro-Blast Corp.—24-page illustrated bulletin No. 205 is descriptive of "Hydro-Blast" method of casting cleaning without creating dust. Sand, air and water are combined in method for core removal, surface cleaning, and complete finishing except for grinding and chip-pling. Illustrations and diagrams show installations, flow diagrams, and equipment layout.

## 2. Centrifugal Pumps

Fairbanks, Morse & Co.—24-page illustrated bulletin No. 5810D gives applications, selection data, specifications, descriptions and engineering information on complete line of single stage, split case centrifugal pumps for industrial application.

## 3. Welding Hose

Hewitt Rubber Corp.—6-page illustrated folder, "Cuts Welding Cost," is descriptive of "Twin-Weld" hose, a patented construction which combines both acetylene and oxygen lines into one easily handled unit. Features of this construction are shown.

## 4. Broaching Presses

Colonial Broach Co.—Illustrated catalog No. B-62 includes bulletins on various types of broaching machines for every purpose. Those covered include light and heavy duty power presses, surface broaching machines, pusher and pull type units, and broach sharpening machines.

## 5. Band Saws

DoAll Saws, Inc.—32-page illustrated booklet, "DoAll Saws," explains variables found in several types of narrow saws, shows how they are used, and gives cutting speeds that should be employed on various materials. Case histories and performance records on all types of metal cutting are given.

## 6. Shaped Wire

Page Steel & Wire division, American Chain & Cable Co.—12-page illustrated bulletin, "Shaped Wire", lists shapes of wire available and gives information on grade, temper and finishes. Chart shows methods of calculating areas of common shapes. Tables list applications of various analyses of "Page-Allegheny" stainless steel shaped wire.

## 7. Automatic Lathes

Gisholt Machine Co.—Illustrated performance data sheets Nos. 62, 63, 64, and 65 are case studies on use of automatic lathes in machining tractor parts, steam trap heads, and oil well plugs, and on use of "Dynerlic" balancing machine for rayon spinning machine spindle whorls.

## 8. Adult Education

International Correspondence Schools—28-page illustrated bulletin No. 8525 is entitled, "Ways and Means that Insure Your Training Program." Management participation, training by correspondence method, apprentice training, and available courses are some of the subjects covered.

## 9. Gear Pumps

Hydro-Power Systems, Inc.—14-page illustrated bulletin No. 402 gives complete data and information on gear pumps for use as prime movers for hydraulically operated machinery. Details of design, operating characteristics, and applications are included.

## 10. Cap Screws

Cleveland Cap Screw Co.—64-page illustrated catalog E presents specifications, dimensions, and list prices of all types of bolts, screws, nuts, pins, studs, and washers. All products are grouped under correct classification for ready reference.

## 11. Industrial Trailers

Ohio Galvanizing & Manufacturing Co.—4-page illustrated folder is descriptive of "Ohio 2001" one piece, T-section steel frame trailer of 2 1/4 ton capacity for general industrial and warehouse use. Features are described and specifications given.

## 12. Unit Heaters

Surface Combustion Corp.—12-page illustrated bulletin No. SP-372 describes "Janitrol" gas fired unit heaters in propeller, blower, floor, and duct designs. Construction details, operating features, and range of sizes are included.

## 13. Conveyors

Alvey Conveyor Manufacturing Co.—4-page illustrated bulletin, "Ever Forward", outlines need for adequate material handling systems in modern industry. Installations are shown pictorially in motor plant, mail order house, brewery, printing plant, and dairy.

## 14. Distribution Transformers

Allis-Chalmers Manufacturing Co.—16-page illustrated bulletin No. B-6096 describes distribution transformers with ratings of 1 1/2 to 25 kilovolt-amperes, in 2400, 4800, 7200, and 7620 voltage capacities. Outstanding features of these units are shown.

## 15. Lever Arm Buckets

Blaw-Knox Co.—36-page illustrated bulletin No. 1757 presents construction details, specifications, and applications of two-line lever arm buckets for re-handling, barge cleanup, dredging, hard digging, and general purpose use.

## 16. Thermometers & Gages

Brown Instrument Co.—20-page illustrated catalog No. 6706 covers complete line of vapor actuated, mercury actuated, and portable thermometers for indicating, recording and controlling processing operations. Pressure gages of similar design are also described.

## 17. Building Maintenance

Flexrock Co.—68-page illustrated "Handbook of Building Maintenance" describes line of products for floor, roof, and wall maintenance. Instructions for applying wearing surface materials, leak stopping and water-proofing materials, and other maintenance products are given.

## 18. Weighing Equipment

Toledo Scale Co.—16-page illustrated broadside, "45,000 Ways to Weigh" contains description of scales for practically every purpose. Illustrations show applications of weighing equipment in all types of industries.

## 19. Wire & Cables

John A. Roebling's Sons Co.—32-page illustrated catalog, "Rubber Covered Wires and Cables", is devoted to building wires and service entrance cables of all types. Description and specifications on strandings, insulations, and coverings, as well as engineering information are included.

## 20. Materials Handling

All Steel Welded Truck Corp.—46-page illustrated catalog, "Clark Materials Handling Equipment", describes lift jack system in connection with wheeled platforms. Factory and warehouse trucks and trallers of all types are described also.

## 21. Pig Casting Machine

William M. Bailey Co.—8-page illustrated bulletin No. 8750 is descriptive of single and double strand, stationary wheel pig casting machine. Specifications, design details, and installation views are included on this production unit.

## 22. Quenching Machine

Hannifin Manufacturing Co.—4-page illustrated bulletin No. 55 is descriptive of centrifugal quenching machine which provides accurate and controlled quenching of circular parts. Distortion is avoided and uniform metallurgical results are claimed.

## 23. Galvanizing

American Hot Dip Galvanizers Association, Inc.—4-page data folder and specification sheet No. 3708 deals with general data on hot dip galvanizing. Rust prevention, applying zinc coatings, general specifications, and list of special specifications available are included.

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## 24. Refractories

Carborundum Co.—76-page spiral-bound illustrated catalog, "Super Refractories", gives complete properties and applications of silicon carbide, fused aluminum oxide, mullite, and aluminum silicate refractories. Products for practically every known type of furnace, bath, oven, kiln, and similar constructions are described or listed.

## 25. Molybdenum

Climax Molybdenum Co.—16-page illustrated technical bulletin, "Fundamental Effects in Steel", is a guide book on use of molybdenum in steel alloys. Effect on mechanical properties, fabrication and heat treatment, and methods of using molybdenum are covered in detail by text and with charts.

## 26. Machining Steel

Carboloy Co.—16-page illustrated bulletin No. GT-123 covers tool design and selection, use of coolants, chip breaker design and use, tables of feeds, and horsepower calculation data in machining steel with cemented carbide tools. Supplementary data is included for machining cast iron, nonferrous metals, and nonmetallic materials.

## 27. Drill Press

Buffalo Forge Co.—8-page illustrated bulletin No. 3257 includes details of construction, specifications and capacities of No. 2 and No. 3 "RPMster," pedestal type drills which feature instant speed change, V-belt drive, geared power feed and alloy back gears.

## 28. Oil Cushion Bearings

Boston Gear Works, Inc.—16-page illustrated catalog No. 1-39 lists "Oilite" oil cushion precision bronze bearings which are available from stock in cylindrical, flanged, and thrust types. Dimensions, prices and specifications are given for entire line.

## 29. Hobbing Accessories

Barber-Colman Co.—4-page illustrated bulletin No. F-1410-1 covers special units and accessories for use with No. 3 standard and No. 3 precision hobbing machines. These include cam feeds, swivels, collets, oiling system, spindle and micrometer adjustment.

## 30. Treated Timber

Wood Preserving Corp.—20-page illustrated bulletin, "Pressure Treated Timber," describes processes for preservation treatment of timber. Preparation of timber, application in industrial plants and coal mines, as well as economics of use, are covered.

## 31. Springs

Lee Spring Co.—4-page illustrated bulletin, "Lee-Spring Bulldozer," contains design and application information on all types of springs. Such factors as stability, accuracy, and endurance are outlined as desired objectives in spring design.

# «« HELPFUL LITERATURE

(Continued)

## 32. Plastics

Durez Plastics & Chemicals, Inc.—20-page illustrated bulletin, "It's a New Business Custom," includes actual case studies by prominent manufacturers on applications of "Durez" plastics in design of commercial and industrial equipment.

## 33. Zinc

American Zinc Institute, Inc.—32-page illustrated booklet, "The Zinc Industry," by Ernest V. Gent, is a market-to-line outline of this industry. History of zinc, consumption, use, alloys, production, and marketing are covered by the text and through the use of charts and drawings.

## 34. Industrial Fire Hose

B. F. Goodrich Co.—4-page illustrated catalog No. 3750 is entitled, "Industrial Fire Hose." Specifications and construction details are given for various grades of single and double jacket hoses, and rubber covered hose. Among fittings described are swivel gaskets of "Koroseal," a synthetic rubber which prevents locking and freezing of swivels.

## 35. Gas & Diesel Engines

Cooper-Bessemer Corp.—12-page illustrated bulletin No. 331 is descriptive of type JS stationary gas and diesel engines. These units are self-contained, four-cycle engines, built in five, six, seven and eight cylinder models. Engines are convertible from gas to diesel or diesel to gas operation.

## 36. Aluminum Bronze

Ampco Metal, Inc.—16-page illustrated bulletin, "Ampco Metal", briefly presents facts about this copper, high-aluminum, high-iron alloy as a material for bushings, bearings, gears, and similar applications where long life and resistance to wear are important.

## 37. Furnace Pressure Control

Leeds & Northrup Co.—12-page illustrated catalog No. N-01A-600 describes features of L&N metallurgical and industrial furnace pressure control system. Instrument has mechanism housed in flush mounting type case and enables user to obtain exact sensitivity which furnace conditions require.

## 38. Carburizing Baths

A. F. Holden Co.—4-page illustrated bulletin, "Carburizing Baths", points out advantages of complete water solubility, pot life, and low operating cost of these units. Photomicrographs of S.A.E. steels carburized in baths show microstructure and case depth.

## 39. Heat Insulation

Phillip Carey Co.—24-page illustrated catalog, "Heat Insulation for Industry", contains selection guide, specifications, engineering data, and description of complete line of asbestos, magnesia, diatomite, and rockwool insulations for industrial application.

## 40. Materials Handling

C. O. Bartlett & Snow Co.—372-page illustrated general catalog No. 90 presents complete information on line of chains, sprockets, elevators, conveyors, miscellaneous parts, and processing equipment. Full specifications, prices, and engineering data are given for equipment and component parts.

## 41. Milling Machine

Fray Machine Tool Co.—8-page illustrated bulletin, "All Angle Milling Machines No. 7," explains features of this universal machine which include flexibility, wide range of spindle speeds, rigidity of construction and accuracy. Details of milling attachments, accessories, and tools are also given.

## 42. Carburizer

Hevl Duty Electric Co.—20-page illustrated bulletin No. HD 940 describes and gives specifications of electric carburizers, and shows operating principle. Micrographs show metal structure of steel before and after carburizing for one, two, three and four hours. Installation views are included.

## 43. Welding Electrodes

Electroloy Co.—Loose-leaf illustrated catalog, "Electroloy Alloys," covers materials for resistance welding electrodes and dies on spot, seam, butt, flash, and projection welding equipment. Complete specifications and prices are given for entire line.

## 44. Insulating Fire Brick

A. P. Green Fire Brick Co.—8-page illustrated bulletin, "Insulating Fire Brick with Balanced Properties", contains technical data on this line of lightweight fire brick for use in direct contact with flame and furnace gases.

## 45. Spot Welder

Pier Equipment Manufacturing Co.—4-page illustrated folder, "How to Choose Your Spot Welder," contains condensed data on manually operated and automatic types of spot welding equipment. Brief descriptions are included concerning applications of available sizes up to 50 kilovolt-ampere machines.

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1600 tons, new assembly plant Curtiss Aeroplane division of Curtiss Wright Corp., Buffalo, to Bethlehem Steel Co., Buffalo.

840 tons, housing project, Hartford, Conn., to Ceco Steel Products Corp., New York, through William Crow Construction Co., New York.

700 tons, piling, contract 33, Marginal street, New York, to Carnegie-Illinois Steel Corp., Pittsburgh, through Allen N. Spooner & Son Inc., New York.

500 tons, cantonment extension, Fort Meade, Md., to Bethlehem Steel Co., Bethlehem, Pa., through Consolidated Engineering Co., Baltimore.

465 tons, section S-9-B, Chicago subway, to Olney J. Dean Steel Co., Chicago.

300 tons, state highway project, route 59, Clearfield county, Pennsylvania, to Truscon Steel Co., Youngstown, through Midwest Construction Co.

225 tons, highway project RC-40-84, Cayuga county, New York, to Wickwire Spencer Steel Co., New York; Mohawk Paving Co. Inc., Buffalo, contractor, bids Oct. 16, Albany.

220 tons, Seattle naval reserve armory, to Truscon Steel Co., Youngstown, O.

200 tons, building, Northern Pump Co., Minneapolis, to Truscon Steel Co., Youngstown.

195 tons, steel wire mesh, army engineer, Washington district, to Wickwire Spencer Steel Co., Buffalo, \$68.50 per ton, Pro. 53.

185 tons, highway, Worth county, Iowa, to Laclède Steel Co., St. Louis.

177 tons, engineering building, Marquette university, Milwaukee, Hunziger Construction Co., contractor, to Worden Allen Co., Chicago.

142 tons, bars and mesh, runways, Barksdale field, Louisiana, to Sheffield Steel Corp., Kansas City, Mo., through Austin Construction Co., Dallas, Tex.

118 tons, laboratory for wind tunnel, Moffett Field, Calif., to Gilmore Fabricators Inc., San Francisco.

100 tons, two Washington state highway projects, to Northwest Steel Rolling Mills, Seattle.

100 tons, factory building for manufacture of metal searchlight mirrors, Cincinnati, to Truscon Steel Co., Youngstown, O.; Ferro Concrete Construction Co., Cincinnati, contractor.

100 tons, additional ammunition facilities and housing units, naval station, Indian head, Md., to Hudson Supply & Equipment Co., Washington; Harwood-Nebel Construction Co., Washington, contractor.

### Reinforcing Steel Pending

1000 tons, estimated, 1400-foot pier, Puget Sound navy yard; Puget Sound Bridge & Dredging Co. and Rumsey & Co., Seattle, general contractors.

935 tons, housing project, Newark, N. J.; Pellechia Construction Co., Newark, N. J., low.

720 tons, Washington state highway projects; bids in at Olympia.

650 tons, two sections elevated highway approach, Battery-Brooklyn tunnel, Brooklyn; bids Nov. 29 to Triborough bridge authority, New York.

275 tons, quartermaster barracks, invitation 6812-41-26, Scofield Barracks, T. H.; bids postponed until Nov. 27.

100 tons, shell loading plant for U. S. government, Elwood, Ill., Sanderson & Porter, Chicago, engineers.

100 tons or more, state viaduct Union county, Oregon; Colonial Construction Co., Spokane, Wash., general contractor.

### Issues Stock List

■ C. A. Waite Co., Pittsburgh, dealers in steel and forgings, has

issued a stock list of carbon and alloy bars and billets, showing tonnage, analysis and dimensions.

Included in its stock is 388,000 pounds of 5½-inch SAE 1050 squares in 10 and 12-foot lengths.

### High-Speed and Tool Steel Prices Unchanged

Crucible Steel Co. of America, New York, announces its prices for high-speed and tool steel grades will be continued at present levels for first quarter and until further notice.

## Pig Iron

Pig Iron Prices, Page 96

Pittsburgh—Active stacks in the district number 42 of 50, with six of the remaining eight stacks undergoing repairs in preparation for production when necessary. It is certain some of these stacks will see activity before first quarter is well under way. Most sellers here are maintaining the old price and taking business for first quarter at that level. Excitement in the coke situation has died down considerably and apparently the new price

## A GALVANIZED METAL You Can DRAW and PAINT!



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• That's how ARMCO galvanized ZINCGRIP-PAINTGRIP sheets went through their profit-paces for the manufacturer of these fuel reservoirs.

This double-purpose metal meant extra advantages for the fabricator. The 3½-inch draw had no effect on the tightly adherent ZINCGRIP coating. There was no flaking, no peeling of the zinc. No die-scoring either.

Next the bonderized surface of ARMCO PAINTGRIP came into play. This special mill finish permitted quick

painting in any color! No etching, no loss of the protective zinc coating.

Time and money were saved on make-ready too. Only a soapy water solution was needed to prepare the sheets for the dies. Since oil was not used surface cleaning before painting was easier and less costly.

Maybe you can profit from this double-edged sales mover and shop saver. The experiences of many other manufacturers with ARMCO ZINCGRIP-PAINTGRIP bear this out. Would you like to see the evidence? We'll be glad to show you. Write The American Rolling Mill Company, 1870 Curtis Street, Middletown, Ohio.

# ARMCO



## ZINCGRIP-PAINTGRIP SHEETS

# Behind the Scenes with STEEL

## Machines and Men

■ Today is not the first decade that has seen the battle of "machines and men." *Nation's Business* reports that in 1828 great steam carriages, like the *Enterprise*, covered many miles and carried many passengers before being legislated out of existence.

## Making Jobs

■ Machinery does create jobs. In 1870, 324 persons were employed to produce the goods and services for each 1000 inhabitants but after 70 years' development of the machine and its use, the ratio has increased to 400 employed to fill the demands of every 1000 inhabitants. So says an interesting little booklet by National Machinery Co., Tiffin, Ohio.

## A Deserved Rest

■ Behind a routine request for a change of address on a long-standing subscription to STEEL last week is the story of a man who has given 53 continuous years of his life to what he calls simply "the steel game." For a much deserved rest, Harry C. Baughman is retiring as superintendent of Open Hearths and Bessemer Depts. at Bethlehem's Sparrows Point works. We're glad to know that every Monday morning in a quiet living room on C Street an entire industry, with all its clatter and smoke, with all its fascination, will be brought to a man who has so long been a hard-working part of it.

## Home Town Boy

■ The INS correspondent from Athens on the Greek-Italian fracas is A. E. Angelopoulos. And does he love to describe those Italian routs.

## Contesters

■ A few weeks ago in New York, 200-odd members of the National Contesters association held their fourth annual convention. It is claimed there are 12,000,000 people in this country who enter various kinds of contests and consistent contesters live practically in a world of their

own, with special vocabulary, ethics, press, rivalries and aristocracy. There are even schools such as the one run by Wilmer S. Shepherd Jr. of Philadelphia where instruction is given by mail. Tuition is \$20 and there are usually about 1000 persons taking the course. At the convention, major winners gave talks on their specialties such as "Jingle Contests," "Word Play," "Limerick Contests," etc. The two hundred experts attending the convention had, in the last year, won 2200 prizes valued at \$60,000. Top contest man in the country is Frank G. Davis of Springfield, Ohio, with winnings to date of \$44,000.

## Bond St. Fashions

■ The latest fashion in London (and apparently fashion in this case was born of necessity) are hats with a steel crown for protection against splinters in air raids. An India rubber band on the steel shell prevents it from cutting into the forehead.

## Thanks To Research

■ Who said Germany has a corner on *Ersatz*? Since 1920 in this country the U. S. Army's list of "Strategic Items" has shrunk from 42 to 15, with only 8 actually vital needs.

## Tops

■ We've done it before but can't resist tossing another bouquet to Basic Dolomite for their outstanding series of ads, another of which appears this week on page 6.

## More Maudes

■ "Maude" is ready again and rarin' to go. The dozens of requests we had on file for copies of our favorite cow have been filled. If you hesitated before drop us a card now and tell us how many you want. A local dog food manufacturer wants to run poor Maude in some advertising with the hint that some of her relatives are a part of their canine specialty. We've become so attached to the old gal, we just couldn't stand the thought of it.

SHRDLU.

will be as expected, around \$5 for supply contracts.

**Cleveland**—November will easily be the best month of the year to date on shipments. New business is still light and will remain so until after books are opened for first quarter, with prices named. Producers believe that tenuous conditions are still to come, some placing second quarter as the zero period, when stocks will have been exhausted and shipments will be only from current production. No genuine bottlenecks have yet developed in iron, coke or related materials.

**Chicago**—Shipments of pig iron are steady. Gray iron and malleable foundries are holding their operations at an even level and in some instances show small increases. They are specifying iron shipments in close balance with production and not increasing inventories beyond comfortable limits. Situation for foundry coke is still tight with sellers being pressed by customers. Order books are full well into next year.

**Boston**—Buying is in scattered small spot lots but shipments are heavy, with foundry melt tending upward. Consumers will take all the iron possible against fourth quarter commitments and some would purchase against estimated needs early next year, but sellers are reluctant to sell beyond 1940.

**New York**—Specifications are by far the heaviest this year. Practically all releases are against contracts, with orders spotty. Desire to make reservations for first quarter accounts for a fair volume. Heavy specifications are due to expanding consumption and to some extent to a desire to build up stocks.

**Philadelphia**—Wider distribution of inquiries among pig iron sellers attests inability of some producers to satisfy customers' demands fully. In most cases sellers find it difficult to take care of regular accounts, let alone add new ones. Deliveries are behind schedule in a number of instances.

**Buffalo**—Judging from gains already made, November pig iron shipments are practically sure to reach a new peak for the current movement. Producers do not plan to open books for first quarter, despite indications favoring practically a complete clearance of tonnage on books for fourth quarter.

**Cincinnati**—Upward trend in pig iron shipments continues and spot buying in lots of 50 to 200 tons is accelerated. Some southern furnaces are intent on supplying established customers. Melters show no evidence of pressing for first quarter supplies pending the opening of books.

**St. Louis**—Reflecting increased consumption of basic and foundry

STEEL

iron, specifications and shipments this month have been at the highest rate this year.

All classes of melters are anxious to get in all iron owed them under contracts in order to be on the safe side and to avoid possibly too heavy weather as the winter progresses.

Owing to the fact that most users are covered for the remainder of this year, buying has dwindled to insignificant proportions. Sellers say their order books will be clear of all 1940 business by Jan. 1.

**Birmingham, Ala.** — All 18 blast furnaces are back in operation to restore pig iron production to capacity. Need for iron is still quite apparent at steel plants and merchant melters are stacking a minimum on their yards.

**Toronto, Ont.** — Increasing demands are developing for foundry and malleable pig iron and sales of basic also are gaining steadily. Blast furnace operators are maintaining production almost to their maximum but with steelmaking requirements taking most of the output only a limited supply is available for the commercial market.

## Scrap

Scrap Prices, Page 98

**Pittsburgh** — There is no change in quotations. Brokers report an apparent shortage of material, but with demand fairly light, this is not an important factor. Blast furnace material continues in heavy demand, with open-hearth grades moving fairly well at currently quoted levels.

**Cleveland** — Prices paid on recent railroad lists have strengthened the market. Melters are slow to buy further ahead but are taking deliveries on contracts. Supply is sufficient for demand. Heavier cast grades, scrap rails and railroad malleable have advanced 50 cents per ton.

**Chicago** — In spite of moderate trading and little disposition of mills to buy, tone of the scrap market remains strong. Two 25 cent advances have firmly established No. 1 heavy melting steel at \$20 to \$20.50, the top price having been paid in two recent small mill transactions. It is understood, too, that brokers in some instances have paid \$20.50 for material to fulfill current contracts. Other grades of scrap have advanced in proportion.

**Boston** — Lower quotations on several grades for eastern Pennsylvania shipment have failed to weaken prices on most cast selections for New England delivery. Slackening of buying for export results in mixed or easier prices. Domestic demand is substantial. For water

shipment to Baltimore brokers offer \$16 and \$15 for heavy melting steel, barge, off 50 cents.

**Philadelphia** — Except for further strengthening in cast grades the district scrap market remains unusually steady. No. 1 heavy melting steel at \$20.50 to \$21 has been unchanged for two months. Light supply of cast scrap for both foundry and open hearth use has resulted in further advances of 50 cents in both classifications. Machine shop turnings also are stronger.

**New York** — Shipments to eastern steelworks are active and buying is sufficient to move available new supplies. Foundries also are tak-

ing heavier shipments, with cast grades firm. No. 1 machinery cast is up 50 cents to \$18.50. Other grades are firm but generally unchanged, with No. 1 heavy melting steel bringing \$16.50, cars. Buying for export is dull with one ship loading about 2000 tons. Little tonnage remains on barge for export, most having been diverted to domestic use.

**Buffalo** — Strength continues to dominate the market as steelmaking grades scored another 50-cent boost, making \$1.50 for the month, on a sale of approximately 12,000 tons to leading mill consumer on the basis of \$21.50 to \$22 a ton for

*An idea that bore fruit*

The history of this organization is a success story.

It is built upon the idea that, in this competitive age at least, a good product alone can seldom constitute the sole foundation of a successful enterprise.

While we bid for your custom primarily because of our recognized ability to produce high quality lead and zinc, we also endeavor to conduct our business in a manner that will foster a spirit of lasting friendship between ourselves and our customers.

ST. JOSEPH LEAD COMPANY  
250 PARK AVENUE, NEW YORK, N. Y.



THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

No. 1 heavy melting. The usual \$2 a ton differential was also back in effect on No. 2 steel, drop forge flashings, busheling and compressed sheets. In addition, sales of cast iron borings were reported at price advances of 50 cents a ton, or with a range of \$13.50 to \$14 a ton.

**Detroit**—Scrap appears to be marking time, no changes in current quotations being reported. An element of weakness persists, chiefly because of oversupply. New lists will be coming out shortly and will provide an indication of which way the market may turn.

**Cincinnati**—Iron and steel scrap is strong and active. Mills are taking tonnage steadily and in somewhat heavier volume. Blast furnace material is in better demand. Foundries also are more aggressive buyers.

**St. Louis**—Iron and steel scrap is quiet but dealers are buying material to apply on contracts. Tone is strong, with some items higher. Offerings are light and difficulty is being experienced in covering. An east side mill has been purchasing fairly steadily in small lots, taking mainly No. 2 heavy melting steel and cast grades. Total acquisition of this interest in the past week or ten days will run from 2000 to 3000 tons.

**Toronto, Ont.**—Firmer prices are

developing in scrap. Low phosphorus steel and stove plate were marked up 50 cents per ton, dealers now offering \$13 per gross ton for the former and \$14.25 net ton for the latter, delivered local yard. Heavy melting steel is moving freely to Hamilton mills and foundries are pressing dealers for larger tonnages.

**San Francisco**—No change in prices for scrap occurred during the past week and prices in the San Francisco metropolitan area hold at \$13 to \$13.50 a net ton, f.o.b. cars, for No. 1, and at \$12 to \$12.50 a net ton for No. 2. Quotations in the Los Angeles metropolitan area are off 25 cents a net ton. No. 1 is quoted at \$12.75 to \$13.25, and No. 2 at \$11.75 to \$12.25. As mill operations are at the highest point in history large quantities of scrap are required.

## Warehouse

Warehouse Prices, Page 97

**Cleveland**—With one or two warehouses business is not as brisk as a month ago. Others find sales on a par with October which had been one of the best months. Several carload lots per order are being placed, usually considered mill business. Stocks are fairly well round-

ed considering the drain on them. Plates are perhaps scarcest. Prices are firm.

**Chicago**—Warehouse business is well maintained, but the volume for November is somewhat lower than for the corresponding period of October. Sales are well diversified, both as to product and consumer, with alloy products in greatest demand.

**New York**—Volume being moved by warehouses is heavy, buying holding to the high level of last month. Demand is widely diversified, and more consumers are turning to jobbers, who are being pressed to maintain rounded inventories. Secondary prices are firm, even the usual weaker items stiffening, including galvanized sheets, nails and merchant steel pipe.

**Philadelphia**—Sales are gaining slowly, November business to date being about 10 per cent ahead of October. Less than the usual year-end letdown is in prospect for next month.

**Buffalo**—Although stocks of some items are low, warehouses report consumer demand, including a growing volume of mill business, is being filled immediately. Mill deliveries are most extended on bars, plates and structurals. Prices are strong.

**Detroit**—Sales are strong and November totals should register an increase over October. Outlook for December is favorable, though the possibility is seen of some tapering off in January and February.

**Cincinnati**—Warehouse demand is marked by heavier individual orders and volume will be heavier this month than last. Difficulties in maintaining stocks, on retarded mill deliveries, are no more severe in this district than elsewhere and so far jobbers' deliveries have been prompt.

**St. Louis**—Distribution from warehouses is somewhat ahead of the year's peak levels in October. Regular customer demand, plus government requirements and numerous plant expansions account for unusually large tonnages.

## Coke Oven By-Products

Coke By-Product Prices, Page 95

**New York**—Phenol prices have been reduced one cent a pound and sulphate of ammonia will advance Jan. 1 to \$30 per ton, f.o.b. port, effective through June. While production of coke by-products is heavy, active demand mostly against contracts is moving material directly into consumption without accumulations. Requirements of the lacquer trade are heavy involving toluol. Releases of phenol by the plastic and chemical industries are substantial. While chemical demand for naphthalene is

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fairly brisk, buying for household needs is seasonally light. Sulphate of ammonia shipments are active.

## Tin Plate

Tin Plate Prices, Page 94

Tin plate specifications are picking up and once prices are definitely announced for shipment after Jan. 1, a considerable spurt in contracting should develop. Recent buying has been attributed in part to a desire to lay in stocks before deliveries become too far extended. At present shipments can be made in four to five weeks. Export demand is negligible.

In all probability all price action will be delayed until the last possible minute to watch international developments. Unless something occurs to change present plans, there will be reaffirmation. Operations remain at about 45 per cent of capacity.

## Iron Ore

Iron Ore Prices, Page 98

Cleveland—Consumption of Lake Superior iron ore in October was 6,051,347 gross tons, an increase of 379,429 tons over September and of 780,640 tons over a year ago. This was the greatest consumption since May, 1923, when 6,119,000 tons were used. Cumulative consumption for the year to Nov. 1 has been 50,280,269 tons, against 33,344,946 tons for the corresponding period of 1939, states the Lake Superior Iron Ore association, a gain of about 50 per cent.

Total ore at furnaces and on Lake Erie docks Nov. 1 was 41,125,450 tons, against 37,090,053 tons a month ago and 39,004,657 tons a year ago.

## Steel in Europe

Foreign Steel Prices, Page 97

London—(By Cable)—Demand for steel and iron continues intense in Great Britain and works are operating at full speed. Light foundries are obtaining more orders. Imports of hematite pig iron increasing. Practically the whole output of alloy and special steels is being used for war purposes. Pipes and tubes are now admitted free of import duty. Tin plate has been advanced 1s 6d, to £1 11s 6d.

■ Kelsey-Hayes Wheel Co., Detroit, has purchased land near Plymouth, Mich., and will start immediately on construction of a large plant to manufacture Colt and Browning machine guns for Great Britain. Plant will employ approximately 2000.

Funds for plant construction will be supplied by Great Britain.

## Canada's War Orders Total \$6,827,916 in Week

■ Canada's armament production is mounting rapidly and present estimates indicate munitions production will reach \$1,500,000,000 annually in a country where total manufactured production has been only about \$3,000,000,000. Last week's orders totaled \$6,827,916, including:

Shipbuilding: Pletou Foundry & Machine Co. Ltd., Pletou, N. S., \$15,500; Canadlan Marconi Co., Montreal, Inc.,

\$8933; Harley-Kay Ltd., Georgetown, Ont., \$9100.

Dockyard supplies: Gourock Ropes & Canvas Ltd., Montreal, \$7840; C. O. Monat & Co., Ltd., Montreal, \$5026; J. B. Harper, Hull, Que., \$8808.

Instruments: H. R. Bland, Montreal, \$11,172; The Ontario Hughes-Owens Co. Ltd., Ottawa, Ont., \$121,180; Lufkin Rule Co. of Canada, Ltd., Windsor, \$6770.

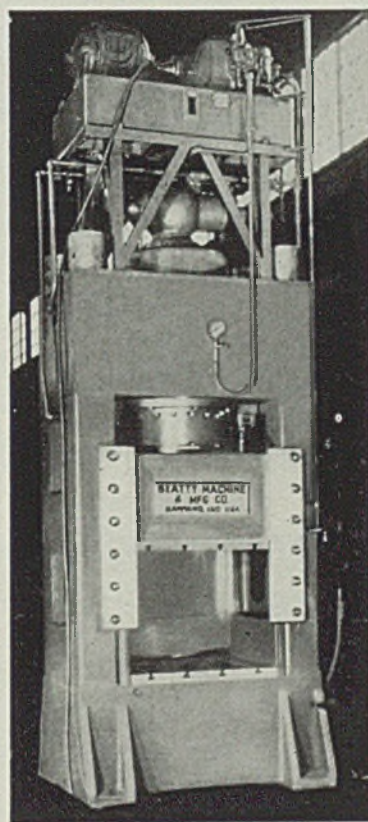
Mechanical transport: War office, England, \$278,973; Dominion Engineering Co. Ltd., Montreal, \$7968; Western Steel Products Corp. Ltd., Ottawa, \$58,125; General Motors of Canada Ltd., Oshawa, \$363,230; Dominion Chain Co. Ltd., Niagara Falls, Ont., \$8533; Cordage Distributors Ltd., Toronto, \$5774; National Steel Car Corp. Ltd., Hamilton, \$136,710; Ford Motor Co. of Canada Ltd., Windsor, \$400,000.

Aircraft: Canadlan Vickers Ltd., Mon-

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Nos.	Cap. in tons	Size platen (inches)	Max. opening (inches)	Stroke (inches)	Operating speeds per minute in inches			H.P. Motor
					Advance	Pressing	Return	
300	200							
300-A	300	36x36	30	18	510	11	475	10 to 25
400	400							
400-A	500	42x42	48	26	510	11	475	20 to 30
400-B	750							
500	400							
500-A	500	60x60	48	26	510	11	475	20 to 30
500-B	750							

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lreal, \$16,718; MacDonald Bros. Aircraft Ltd., Ottawa, \$36,680; G. H. Wood & Co. Ltd., Ottawa, \$48,206; Renfrew Electric & Refrigerator Co. Ltd., Renfrew, Ont., \$21,572.

**Electrical equipment:** Canadian General Electric Co. Ltd., Ottawa, \$65,080; Mis-Can-Ada Mfg. Co. Ltd., Ottawa, \$7776; Northern Electric Co. Ltd., Ottawa, \$25,578; Amalgamated Electric Corp. Ltd., Toronto, \$42,331; Exlde Batteries of Canada Ltd., Toronto, \$9806; Chadwick Carroll Brass & Fixtures Ltd., Hamilton, \$43,760.

**Machinery:** E. W. Bliss Co. of Canada Ltd., Toronto, \$81,300.

**Hardware:** Anglo Canadian Wire Rope Co., Montreal, \$6189.

**Miscellaneous:** LaFrance Fire Engine & Foamite Ltd., Toronto, \$10,801; Hill-Clark-Francis Ltd., New Liskeard, Ont., \$33,326; Asbestos Corp. Ltd., St. Lambert, Que., \$11,660; General Steel Wares Ltd., Ottawa, \$61,500; B. F. Goodrich Rubber Co. of Canada Ltd., Kitchener, Ont., \$11,288; Medalta Potteries Ltd., Calgary, Alta, \$27,750; Belmont Construction Co., Montreal, \$34,900; Poole Construction Co., Calgary, Alta, \$34,800.

**Construction:** Ambrose Wheeler, Ltd., Moncton, N. B., \$69,577; Armstrong Bros. Construction Co., Brampton, Ont., \$72,603; Schultz Construction Co., Brantford, Ont., \$62,993; Claydon Co. Ltd., Winnipeg, Man., \$536,713; Poole Construction Co. Ltd., Edmonton, Alta., \$787,918.

## Canada's Steel Industry Capitalized at \$113,660,251

■ Thirty-nine companies operating 54 plants and employing \$113,660,251 as capital comprised the primary iron and steel industry of

Canada in 1939, according to a report from the Canadian Bureau of Statistics. An average of 13,827 employees is reported for the year, with salaries and wages totaling \$20,410,517.

Materials consumed cost \$29,629,376 while outlay for fuel and electricity was \$6,174,661. Gross selling value of the products manufactured was \$75,934,481.

## Nonferrous Metals

**New York**—Buying pressure in nonferrous metals lifted further last week, although all sellers booked as much as they cared to offer. Supplies for nearby delivery remained tight in all markets.

**Copper** — Mine producers continued to account for bulk of new business, although they allocated sales at their 12-cent price level. Custom smelters were in a better position to offer nearby delivery on which they obtained a ⅓-cent premium while brokers quoted ¼ to ⅓-cent premiums. Total sales continued in excess of output.

**Lead** — Refined stocks dropped 5906 tons further in October, bringing the total to a 12-year low of 35,386 tons. This compared with October shipments of 62,496 tons. Although spot supplies continued tight, demand about balanced output for the week. Foreign metal

## Nonferrous Metal Prices

		Copper			Straits Tin, New York		Lead	Lead	Zinc	Aluminum	Anti-	Nickel
Nov.	Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	N. Y.	East St. L.	St. L.	99% Spot, N.Y.	Amer. Spot, N.Y.	Cathodes	
16	12.00	12.00	12.12 ½	50.50	50.15	5.80	5.65	7.25	18.00	14.00	35.00	
18	12.00	12.00	12.12 ½	50.50	50.15	5.80	5.65	7.25	17.00	14.00	35.00	
19	12.00	12.00	12.12 ½	50.30	50.12 ½	5.80	5.65	7.25	17.00	14.00	35.00	
20	12.00	12.00	12.12 ½	50.25	50.05	5.80	5.65	7.25	17.00	14.00	35.00	
21	Holiday											
22	12.00	12.00	12.12 ½	50.37 ½	50.20	5.80	5.65	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	9.05
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
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### OLD METALS

#### Nom. Dealers' Buying Prices No. 1 Composition Red Brass

New York	8.00-8.25
Cleveland	8.62 ½-9.12 ½
Chicago	8.25-8.50
St. Louis	8.37 ½

#### Heavy Copper and Wire

New York, No. 1	9.62 ½-9.87 ½
Cleveland, No. 1	9.37 ½-9.87 ½
Chicago, No. 1	9.75-10.00
St. Louis	9.37 ½

<b>Composition Brass Turnings</b>	
New York	7.62 ½-7.87 ½

### Light Copper

New York	7.62 ½-7.87 ½
Cleveland	7.37 ½-7.87 ½
Chicago	7.75-8.00
St. Louis	7.87 ½

### Light Brass

Cleveland	4.12 ½-4.37 ½
Chicago	5.62 ½-5.87 ½
St. Louis	4.87 ½

### Lead

New York	4.90-5.00
Cleveland	4.00-4.25
Chicago	4.50-4.75
St. Louis	3.62 ½-3.87 ½

### Zinc

New York	3.57 ½-4.12 ½
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, 85-5-5-3, less carloads	13.25
Standard No. 12 aluminum	15.00-15.50



is still being imported to augment available supplies.

**Zinc**—Premiums of  $\frac{1}{2}$  to nearly  $\frac{3}{4}$ -cent over the New York price were offered for futures on the Commodity exchange, reflecting the extremely tight supply situation. Producers restricted offerings and concentrated their efforts on filling their tremendous commitments. Prime western held at 7.25c, East St. Louis.

**Tin**—Prices slipped around mid-week to a level close to the Metals Reserve Co.'s standing bid of 50.00c before rising to about 50.37 $\frac{1}{2}$ c on Straits spot at the close. Bids submitted on the navy's inquiry for 90 long tons of grade A tin ranged from 50.50c to 50.75c, less  $\frac{1}{2}$  of 1 per cent, for delivery within 60 days to the Brooklyn, N. Y., navy yard.

## Equipment

**New York**—Machine tool builders in numerous instances are accepting no new orders unless such purchases carry high priority ratings for defense production. The industry is now operating under priorities to all intents and purposes, although voluntary. Defense orders, however, continue in heavy volume. Tooling for small arms manufacture is heavy, recent orders including a large list for the Colt interests at Hartford, Conn., and the Raritan, N. J., arsenal is placing many machines. Operating at full capacity, the bottleneck centers in skilled labor and shop equipment. Supplies of materials, including steels, are moving in ample volume, no cases being noted of serious shortages.

**Seattle**—Both out of stock and factory items are moving in large volume, the total turnover being the highest in recent years. In some instances prompt deliveries cannot be guaranteed. Allis-Chalmers Mfg. Co. is low at \$30,105 for furnishing four crawler-type tractors to Bonneville project, which has called following bids: Nov. 28, four 3-drum gas powered hoists for Covington, Spec. 1543; Nov. 29, 637,000 feet wire rope for Ampere, and 300 outdoor bus insulators, Spec. 1539. General Electric Co. is low at \$97,084 to United States engineer for 15-kilovolt transfer bus for Bonneville power house. Same office will open bids Nov. 29 for 15-kilovolt circuit breakers. Tacoma will receive figures Dec. 2 for three 1000-kilovolt-ampere transformers and five others of various capacity, and Dec. 29 for generator voltage regulators, Cushman power plant. Denver has called bids Dec. 2 for motor-driven pump units for Terry irrigation plant, Buffalo rapid project, Montana.

# Construction and Enterprise

## Michigan

**DEARBORN, MICH.**—Hexagon Tool & Engineering Corp., 23830 Harvard street, has been incorporated with \$10,000 to manufacture tools and dies, by Niels H. F. Olsen, 29239 Cherry Hill road, Dearborn, Mich.

**DETROIT**—Production Accessories Inc. has been incorporated with 15,000 shares no par value to deal in conveyor equip-

ment, by Fred R. Vermeersch, 1426 East Ferry avenue.

■ **Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 105 and Reinforcing Bars Pending on page 107 of this issue.**

**DETROIT**—Aeronautical Products Co. has given Austin Co., Cleveland, contract for a \$20,500 addition to its machine shop.

**DETROIT**—Bundy Tubing Co., 10951 Hern avenue, has let general contract to Bryant & Detwiler Co. for a factory building in Macomb county. Smith, Hinchman & Grylls, Detroit, are architects.

**DETROIT**—Buffalo Arms Corp., 2188

National Bank building, has been incorporated with \$10,000 capital, by Melville C. Mason, 2900 Union Guardian building, to deal in war materials.

**DETROIT**—Whitman & Barnes Co., 2108 West Fort street, has let general contract to Banbrook-Gowan Co., Detroit, for a plant building. Marcus R. Burrowes, Detroit, is architect.

**DETROIT**—Riverside Scrap Iron & Metal Co., 9040 West Jefferson avenue, has let general contract for an office building to Albert Diamond, Detroit. I. M. Lewis, Detroit, is architect.

**DOLLAR BAY, MICH.**—Foley Copper Products Co., John Foley, president, has reopened its wire mill after being shut down more than ten years.

**FLINT, MICH.**—Superior Safety Furnace Pipe Co. has awarded contract to Ben Trumble, Flint, for a warehouse building. George Hawes, Flint, is architect.

**IRONWOOD, MICH.**—A. G. Wood, city manager, plans sewage disposal plant to cost about \$40,000. Suhr, Berryman, Peterson & Suhr, 130 North Wells street, Chicago, are engineers.

**MENOMINEE, MICH.**—Lloyd Mfg. Co. is building a one-story plant addition 50 x 68 feet, to be used as tube welding mill for manufacture of tubular furniture.

**PORTLAND, MICH.**—Tri-County Electric Co-operative, Portland, A. R. Snyder, secretary, is having plans prepared by



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#### Connecticut

NORWALK, CONN.—Ericsson Screw Machine Products Co. Inc., 25 Lafayette street, Brooklyn, N. Y., will build a one-story factory, office building and boiler plant 102 x 160 feet at Post road and Richards avenue, to cost about \$70,000. Fletcher-Thompson Inc., 1336 Fairfield avenue, Bridgeport, Conn., is engineer. (Noted Sept. 2.)

#### Maine

BANGOR, ME.—Viner Bros., Hancock street, has let general contract to Wm. H. McPherson Construction Co. Inc., 22 Hudson street for a two-story 50 x 90-foot shoe factory addition, including boiler, stoker and piping, to cost about \$40,000 with equipment. F. A. Patterson, 16 Central street, is architect.

#### Massachusetts

BOSTON—Haffenreffer & Co. Inc., 30 Germania street, will build a boiler plant at its brewery at cost of \$45,000.

#### Rhode Island

PROVIDENCE, R. I.—Liberty Tool & Gage Works Inc., 235 Georgia avenue, has let general contract to C. A. Bigney Construction Co., 44 Franklin street, for a two-story 45 x 83-foot addition.

#### New York

BROOKLYN, N. Y.—Glyco Products Co. Inc., 148 Lafayette street, New York, has let general contract for one-story factory and two-story office and laboratory 80 x 200 feet at 228 King street to Simonsen & Emerson, 101 Park avenue, New York, to cost about \$60,000. (Noted Nov. 11.)

ELMHURST, N. Y.—Pelotto Corp., care A. Emil, 170 Broadway, New York, has plans by A. A. Rothman, 19 Rector street, New York, for a three-story plant for the manufacture of aircraft precision instruments, on Sixty-ninth street, to cost about \$65,000.

GENEVA, N. Y.—Socony-Vacuum Oil Co. Inc., 100 Elk street, Buffalo, will build tanks, storehouse and office facilities at cost of \$40,000. H. M. Graves, care owner, is in charge.

STILLWATER, N. Y.—City is having plans made for sewage disposal plant to cost about \$200,000. Whitman, Requaert & Smith, 11 North Pearl street, Albany, N. Y., are engineers.

#### New Jersey

UNION, N. J.—Elastic Stop Nut Co., Vauxhall road, has let general contract to Austin Co., Cleveland, for a one-story 200 x 214-foot manufacturing addition to cost about \$110,000.

#### Ohio

ALLIANCE, O.—American Steel Foundries Co., 1001 East Broadway, is erecting a storage building covering 7500 square feet.

MONTPELIER, O.—S. A. Powers & Sons have bought a site at Washington and Jonesville streets and will erect a plant with 6600 square feet floor space for manufacture of automotive parts and other devices. Plans are being drawn by Britsch & Munger, architects, Toledo, O.

#### Pennsylvania

ALLENTOWN, PA.—American Armament Corp., A. J. Miranda, president, 6

East Forty-fifth street, New York will remodel its plant for production of armament, at cost of \$500,000, with equipment.

ARDMORE, PA.—Autocar Co., Lancaster avenue, has let general contract for one-story 45 x 225-foot plant addition to J. S. McQuade, 1318 Parish street, Philadelphia, to cost about \$40,000.

CORAOPOLIS, PA.—Standard Steel Spring Co. is expanding its plant at cost of about \$325,000.

FRANKLIN, PA.—Joy Mfg. Co. is remodeling two plants for manufacture of coal mining machinery and loaders at cost of about \$200,000.

LANSDALE, PA.—Hartley Gouze Corp., East Second street, H. J. Hartley in charge, will build a 40 x 200-foot plant to cost \$40,000 with equipment.

TEMPLE, PA.—Empire Steel Casting Co. has let general contract to E. A. Reider, 110 South Tenth street, Reading, Pa., for a one-story plant addition costing over \$50,000.

#### Indiana

EAST CHICAGO, IND.—Linde Air Products division Union Carbide & Carbon Co., 30 East Forty-second street, New York, is having plans made for a chemical plant. James Stewart Corp., 343 South Dearborn street, Chicago, has general contract.

ELKHART, IND.—Standard Tool Machine Works, 218 South Elkhart avenue, has bought Johnson & Biddle Tool Co. property at 1313 West Beardsley avenue and is building an addition to increase production of machine tools and dies.

INDIANAPOLIS — Precision Machine Co. Inc., 2530 Winthrop avenue, has been incorporated with 1000 shares no par value to manufacture screw machine products, by James D. Oakley and associates, same address.

LA PORTE, IND.—Modine Mfg. Co., manufacturer of automobile radiators, air conditioning and heating equipment, will build a one-story addition of 19,800 square feet, to cost about \$100,000, with equipment.

NEW CASTLE, IND.—Jones Iron Corp., 1207 South Twenty-first street, has been incorporated with 1000 shares no par value to process cast iron and other ferrous metals, by Gene Van Hoose and associates, same address.

#### Virginia

GEER, VA.—Marshall Haney, consulting mining engineer, has plans under way for rehabilitating two manganese mines in Virginia and West Virginia and erection of two mills, of 125 and 250-ton capacity, both gravity feed.

#### Missouri

CARROLLTON, MO.—City plans filtration plant and distribution system costing over \$100,000. Burns & McDonnell, 107 Linwood boulevard, Kansas City, Mo., are engineers.

FAYETTE, MO.—City, G. Todd, mayor, plans water purification plant. J. W. Shikles, New York Life building, Kansas City, is engineer.

#### Wisconsin

GREEN BAY, WIS.—Norcor Mfg. Co., manufacturer of engine-cooling radiators, has given contract to Permanent Construction Co. for a plant addition 45 x 87 feet.

MANITOWOC, WIS.—Paragon Electric Co., E. V. Platt, general manager, manufacturer of electric time switches, etc., is having plans made by Frazier & Raftery, 544 North Michigan avenue, Chicago, for a plant 75 x 300 feet.

MILWAUKEE — Allen-Bradley Co., manufacturer of motor starters and other electrical devices, has given general contract to Selzer-Ornst Co., for one-story addition 90 x 126 feet. Fitzbaugh Scott, 724 East Mason street, is architect.

MILWAUKEE—Bradley Washfountain Co., manufacturer of showers and washfountains, has given general contract to Dahlman Construction Co. for one-story addition 44 x 90 feet.

MILWAUKEE—King Machine Co., 815 West Juneau avenue, has let general contract to Julius Lueck for a one-story machine shop addition 53 x 96 feet. (See

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also STEEL, Nov. 11, for other additions.)

**KENOSHA, WIS.**—MacWhyte Co., manufacturer of wire rope, has given general contract to Austin Co., Cleveland, for one-story plant addition 50 x 100 feet.

**PARK FALLS, WIS.**—Flambeau Paper Co. has given contract to C. R. Meyer & Sons Co., Oshkosh, Wis. for addition to its paper mill.

**RHINELANDER, WIS.**—Rhineland Paper Co. has awarded general contract to C. R. Meyer & Sons Co., Oshkosh, Wis., for one-story addition 102 x 450 feet for washing, finishing and beater rooms and 27 x 64 feet for boiler room addition.

#### Minnesota

**ALBERT LEA, MINN.**—Economy Equipment Co. has been incorporated to manufacture tools and machinery; by Oscar Johnson, Guy R. Johnson and F. G. Wells.

**LAKE CITY, MINN.**—Gillet & Eaton Inc. will build a foundry to replace fire loss, at cost of \$40,000.

**MINNEAPOLIS**—Electric Machinery & Mfg. Co. will let contract soon for one-story plant addition 60 x 200 feet. Toltz, King & Day Inc., Pioneer building, St. Paul, is architect and engineer.

**MINNEAPOLIS**—Smith Welding Equipment Corp. has let general contract to Libby & Libby Co. for an addition and improvements to present plant. Pesel & Shifflet are architects.

**MINNEAPOLIS**—Butler Mfg. Co., manufacturer of tanks, stokers and metal buildings, is building two one-story plant additions, 100 x 102 feet and 25 x 50 feet.

**WASECA, MINN.**—Johnson Radio Co., manufacturer of radio transmission equipment, will double its capacity by addition of a new building 60 x 116 feet, to provide facilities for government orders.

#### Texas

**LONGVIEW, TEX.**—Hubert M. Harrison, vice president and general manager of East Texas Chamber of Commerce, announces 12 cities in East Texas are seeking location of first plant of Madaras Steel Corp. of Texas, which is preparing to reduce Texas iron ore by natural gas. Surface Combustion Co., Toledo, O., has contract for furnaces for the plant.

#### Iowa

**MARSHALLTOWN, IOWA**—Iowa Electric Light & Power Co., Cedar Rapids, has awarded general contract to A. H. Neumann & Bros. Inc., Hubbell building, Des Moines, Iowa, for two-story power plant, 97 x 118 feet to cost about \$1,000,000, including equipment. Two 3750-horsepower diesel engines are included. Abell-Hove Co., 3 West Jackson boulevard, Chicago, are engineers. (Noted Nov. 4.)

#### California

**BURBANK, CALIF.**—Menasco Mfg. Co., 805 San Fernando road, will build addition to strut and engine plant, with 30,000 square feet floor space, to cost about \$400,000, to provide facilities for government work.

**BURBANK, CALIF.**—Vega Airplane Co., 2555 North Hollywood way, will build warehouse No. 75 and assembly building No. 68, at cost of about \$615,000.

**CHULA VISTA, CALIF.**—Rohr Aircraft Corp. will build an aircraft plant at Eighth and J streets, costing about \$50,000.

**CULVER CITY, CALIF.**—Schlutz Stamping Co. has been formed by Emil I. Schlutz and will be located at 5773 West Washington boulevard, Los Angeles.

**HOLLYWOOD, CALIF.**—Schrillo Tool Engineering Co. has been established by Anthony T. Schrillo and will be located at 8679 Melrose avenue, Hollywood.

**LOS ANGELES**—Mullen Aero Products Inc. has been incorporated with \$500,000 capital. William A. Wiltman, 8300 Long Beach boulevard, South Gate, Calif., is representative.

**LOS ANGELES**—Metal Products Engineering Co. has been incorporated with 2500 shares no par value. Represented by O'Melveny & Myers, 435 South Spring street, Los Angeles.

**LOS ANGELES**—Byron Jackson Co., pump and oil tool manufacturer, is building a factory building at 2301 East Vernon avenue, 120 x 300 feet, costing about \$180,000.

**LOS ANGELES**—Pacific Coast Elevator Co. will build a plant addition 24 x 73 feet, costing \$3500, at 4031 Goodwin avenue.

**LOS ANGELES**—Harold's Wire Works has been established by Harold A. Strohm and will be established at 2104 Marengo street.

**LOS ANGELES**—Ducommun Metals & Supply Co. will build a warehouse and office building at Alameda and Fortyninth streets, the warehouse 150 x 240 feet, one story; delivery department and offices, two stories, 144 x 244 feet, to cost about \$350,000.

**LOS ANGELES**—Mission Water Heater Co. will build a plant at 7101 McKinley avenue at cost of about \$17,000.

**LOS ANGELES**—All-American Aircraft Products Inc. has been incorporated with \$200,000 capital. H. D. Lawrence, 1115 Security building, Long Beach, Calif., is representative.

#### Oregon

**PORTLAND, OREG.**—Steel Tank &

Pipe Co. has completed a plant addition and is having plans made for two others. Contracts now on books involve more than 5000 tons of plates.

#### Canada

**WINNIPEG, MAN.**—Furnaceman Mfg. Co., 300 Spence street, will build one-story plant 50 x 60 feet, to cost about \$50,000.

**HAMILTON, ONT.**—Canada Iron Foundries Ltd., Stuart street West, will build one-story 40 x 80-foot addition. General contract to W. H. Cooper Construction Co. Ltd., Medical Arts building.

**HAMILTON, ONT.**—Canadian West-Inghouse Co. Ltd., 289 Sanford street North, will build a plant addition 300 x 800 feet. General contract to Frid Construction Co. Ltd., 128 King street East.

**LONDON, ONT.**—Department of munitions and supply, Ottawa, Ont., will receive bids about Dec. 15 for airplane plant near Crumlin airport, here, to cost about \$3,000,000. Q. H. Turnbull is acting secretary of the department.

**YORK TOWNSHIP, ONT.**—De Havilland Aircraft of Canada Ltd. will build assembly and repair plant and dope room at plant here at cost of about \$1,000,000. Plans being made by David Shepherd, architect, 1244 Dufferin street, Toronto, Ont.

**MONTREAL, QUE.**—Canadian Tube & Steel Products Ltd., 5675 Hamilton street, is building a \$50,000 plant addition, general contract to J. A. Leclair Dupuis Ltd., 620 Cathcart street.

**MONTREAL, QUE.**—Canadian Liquid Air Co. is erecting plant on Seventh avenue for the manufacture of electric welding rods.

**SHAWINIGAN FALLS, QUE.**—Canadian Carborundum Ltd. will build four additions to its plant, costing \$500,000. General contract has been given to John Wickenden, 1413 Notre Dame street, Three Rivers, Que. Bids will be asked soon on structural steel and furnaces.

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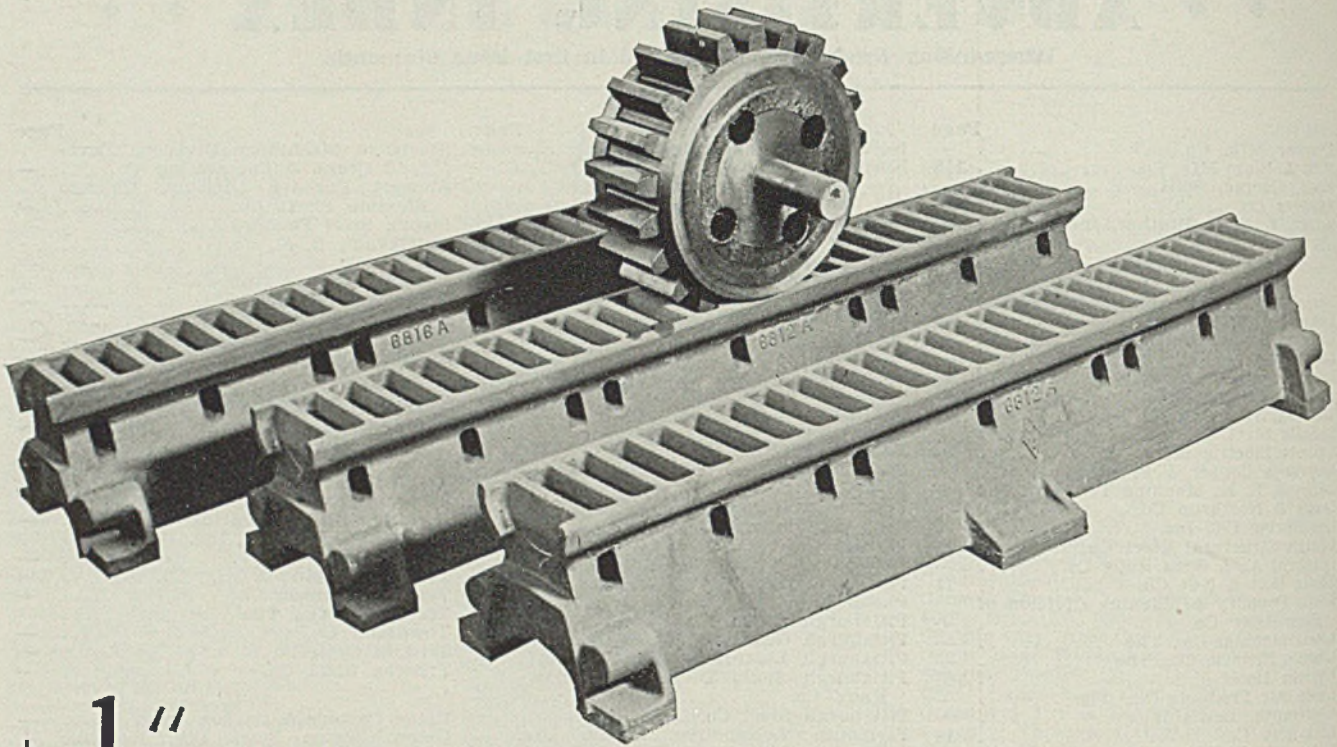
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