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STEEL

ESTABLISHED 1882

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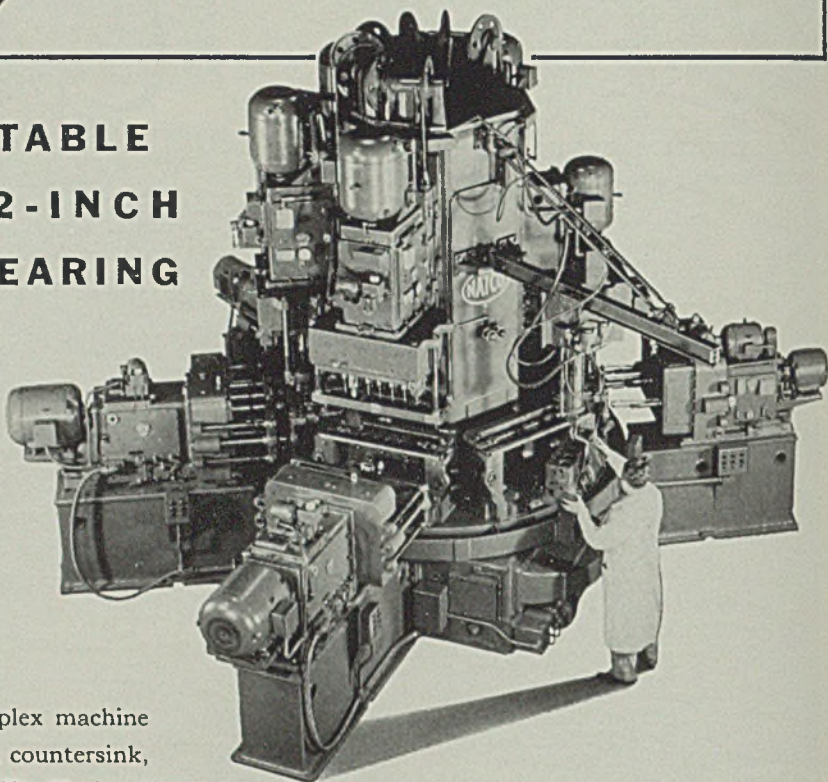
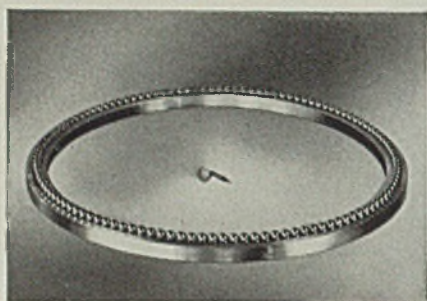
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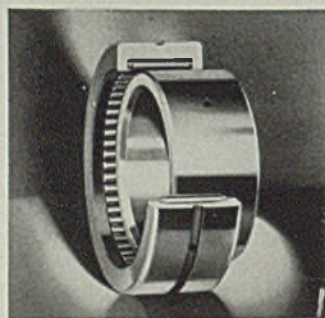


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HIGHLIGHTING THIS ISSUE

■ IMPORTANT decisions were made in Washington last week. The system of "preference classifications" for defense orders (p. 25) contemplates voluntary co-operation for the present, but delivery dates are to be placed on orders, and they "must be met" . . . War department's new policy (p. 25) encourages small manufacturers to bid for portions of orders; bids may be made on an f.o.b. basis . . . That Chrysler contract (p. 26), according to STEEL's information from Detroit, provides for 4000, 20 to 30-ton tanks at a fixed price, employment to be 4000 to 5000, clicking off ten units daily—when the plant is completed, a year from now.

Steelworks operations last week (p. 29) were off ½-point to 90 per cent, due to vacations. The swift pace is telling on furnace linings, needing repairs . . . Great industrial history is in the making; the steel rate could relax and we still might produce more ingots than we did in 1929—

**More Than
in 1929?**

that banner year notable for 60,800,000 tons, and a crash. Peak output of World War I, in 1918, is likely to be exceeded by 10,000,000 tons . . . Steel demand recently (p. 81) has varied little. Heavy backlogs, automobile and defense needs point to sustained mill operations.

Further activity is noted in manganese ore. Imports this year (p. 100) are estimated at 711,000 tons, more than in all 1939. Cuban-American Manganese Corp. is increasing capacity of its Santiago plant about 33 1/3 per cent . . . 4000 men have been graduated under the Connecticut 200-hour, job-training program (p. 21) at an average cost of \$17, trained to operate machines . . . Automobile output in the week (p. 36) increased nearly 9000 units to 20,475, even while

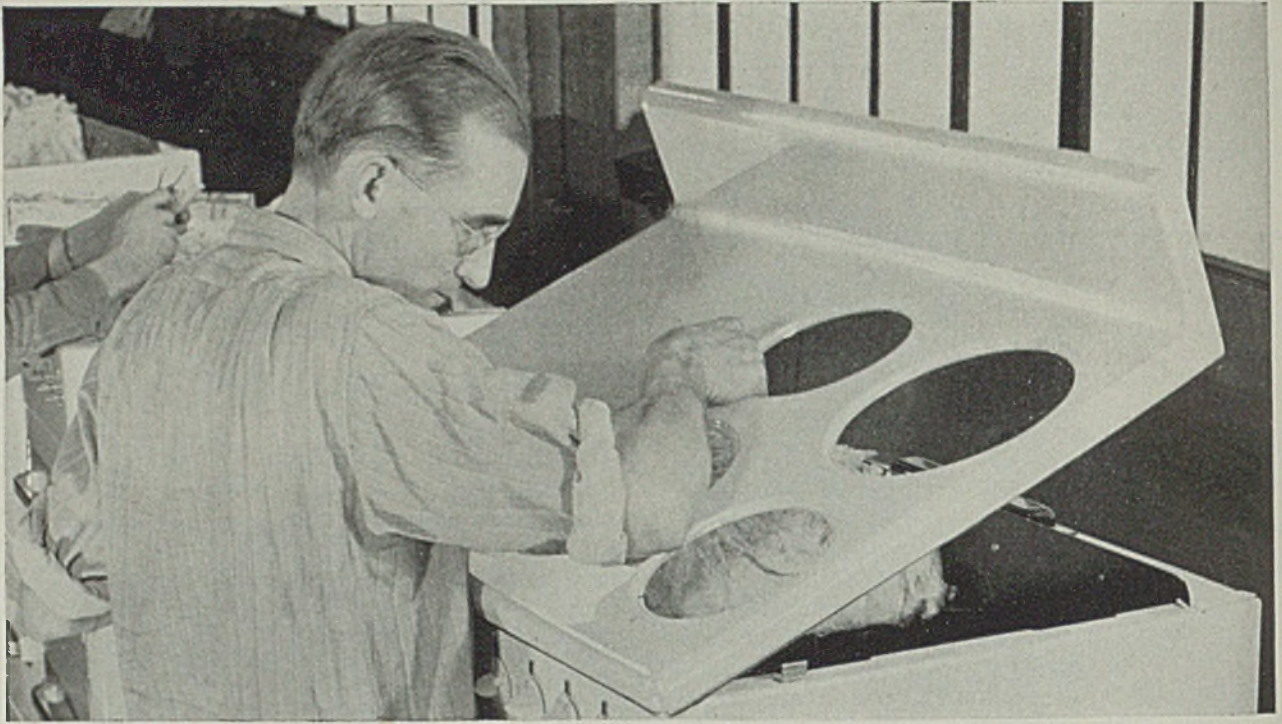
**4000 at
\$17 Per**

more new models were being introduced. Buick calls its new compound carburetor engine Fireball Eight, which leads Mirrors (p. 35) to reflect that some builder will now announce Screwball Six.

Out-moded and inadequate wiring is preventing some metalworking plants and steel mills from utilizing recently improved electrical equipment. Fred Merish (p. 46) surveys this situation and enumerates striking economies which can be effected by re-wiring according to modern standards . . . Gordon T. Williams (p. 49), in an effort to throw further light on an important metallurgical problem, attempts to correlate alloy steel hardenability with physical properties. Experiments seem to indicate that no direct relationship exists . . . A. C. Cummins (p. 56) observes after extended study that with few exceptions standards of tolerance for hot rolled steel products have been established insofar as is feasible until rolling equipment is further improved.

H. T. Hansen (p. 60), describing a new non-ferrous metals smelter plant in Chicago, points out that the layout and production facilities were engineered completely around materials handling requirements. Result is an efficient system which lowers costs . . . Fred B. Jacobs (p. 68) discusses in considerable detail unusual machine and assembly operations in the manufacture of roller chain of a design to permit internal lubrication . . . Multiple spot welds at the rate of 100 per cent are made in a new machine (p. 72) designed to join the two halves of automobile hood tops. Heart of the machine is the timer which permits current application up to 24 cycles.

Handling in A Smelter



Inland Enameling Iron Sheets give better performance in the shop . . . and **DOUBLE TIGHT ADHERENCE**

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Quick-Action, Yankee Plan Gets Results In Call for Skilled Workers . . .

*Simple and Direct Method That Means Business
Now Graduating Thousands at Average Cost Below
\$17—"An Outstanding Accomplishment in Emer-
gency Training for the Metalworking Industries"*

By B. K. PRICE
Associate Editor, STEEL

■ WHEN the Connecticut job-training plan got off to a modest start last fall few foresaw the rise to national prominence which it was to achieve within the following months. It was designed primarily to relieve unemployment. Yet numerous plans had been set forth throughout the country in previous years without important results, and many of the more sound-appearing plans never even had a chance, because they were contingent upon too many changes in policy in Washington and such changes were remote so long as the New Deal administration continued.

It was not surprising that many viewed it passingly in the light of just another program which might or might not fulfill the purpose intended. Certainly it was viewed with no such optimism as its success has warranted.

Perhaps modest aims and the very simplicity of the Connecticut program had something to do with this early attitude. There was no particular fanfare; no heavy expenditures of taxpayers' money—in fact, to date administrative expenses have amounted to less than \$500. The problems involved were essentially local community problems in a relatively small state; and the plan was developed and put into operation by a committee comprised of volunteers working without pay and in such spare time as they could give.

In all fairness, it may be assumed that if industry in Connecticut had been flat on its back at the time of the inauguration of the plan—absolutely prostrate as perhaps it was at some time during the depth of the depression—the plan might

have failed; and that if there had not been the sharply increased need for trained workers that has since become apparent with the expansion of the national defense program there might not have been the widespread interest that has developed with the federal government, itself, now tearing whole leaves from the book of the Connecticut job-training program.

However, Connecticut manufacturers were all set to go on it in any event, for they believed the plan involved merits which would prove valuable regardless of conditions; and the very flexibility of the plan

■ This is the first of a series of articles dealing with the great industrial problem: How can thousands of workers be trained rapidly to a sufficient level of skill to meet the requirements of the national defense program?

According to Mr. Price, Connecticut already has the answer. Under its 200-hour job-training plan, started last fall by Governor Baldwin co-operating with manufacturers, more than 4000 men have been graduated directly into skilled trades at an average cost of only \$17. Training facilities have been increased to 1000 per month, at still lower per capita cost; a remarkable co-operative venture, showing what Yankee spirit can do when aroused.

As referred to by Warner Seely, secretary, Warner & Swasey Co., in an address at the Silver Bay (N. Y.) Industrial conference, July 25: "It is an outstanding accomplishment in emergency training for the metalworking industries."

Subsequent articles will tell what other groups are doing to train men to man machines.

has never been better demonstrated than today in its application to the expanding demands of the emergency defense program.

Admittedly, it is not a panacea; it is not the answer, by a long way, to all the various problems arising in connection with industrial training and unemployment; nor was it intended to be. It was simply designed to ascertain what jobs might be available for beginners in various communities and then within a brief period to train men to a point where they would be acceptable as beginners.

A survey of the unemployment situation in Connecticut revealed that approximately one-third of those still available for employment were persons in the older brackets—40 years of age and beyond and that another third were younger persons ranging from 16 to 25 years. It became apparent these two groups needed the most help. In fact, the plan originally was proposed to foster the interests to one of these two groups, the older group.

Many older men had found their age against them in the search for work and a number had been unemployed since early in the depression and their situations had become increasingly discouraging as time passed. Many had been skilled workmen with years of potential service ahead, but they had become "skill-rusty".

But it developed that the situation with the younger men was equally bad. Many had been out of school for several years without having had a real job; as time passed thousands more were graduated from school into the ranks of the unemployed, their status became

increasingly difficult.

The job-training plan provides for a training course of 200 hours, and in the case of the machinist trade, where openings have been the most numerous, the objectives have been to familiarize the students with measuring tools, simple blueprint reading, and, by some work on the machines, to develop at least an appreciation of accuracy.

Originally, the plan was to train men in the use of machines known to be in general use in the community in which they were being taught. However, the needs of the national defense program has since made it desirable in many cases to train men specifically for certain jobs in a certain plant.

For instance, it is pointed out that if an aircraft plant is to be built, with a known demand for beginners in machine shop practice, the required number can be trained, not only generally, but specifically for the specific machines on which, it is expected, they will be put to work. Thus also the course lends itself readily to the training of beginner-specialists for such relatively specialized occupations as filing, airplane riveting, fabric stitching (a course for women), sheet metal work and so forth.

Governor Raymond E. Baldwin, took an interest in the employment problem from the time he first assumed office, Jan. 4, 1939, and obtained authorization to appoint a committee to study employment. He

appointed Carl A. Gray, an industrialist of Farmington, Conn., to head the commission. Mr. Gray has proved to be a man of initiative and drive and with plenty of ideas of his own, and, as such, contributed much to the job training plan.

A survey was made to ascertain the employables in each community. This means a canvass of unemployment and a separation of the employables unemployed from the unemployables. Where an actual headcount was impracticable, a statistical compilation, based on commonly employed and accepted cross-sectional methods, was used. The survey was then broken down into occupational groups, first for the state as a whole, then by localities. This breakdown was based upon figures of the Connecticut state employment offices. The survey required three months.

Public Relations Included

Another survey followed to determine the employment needs and possibilities of each locality, a survey undertaken by a local committee which comprised citizens from all types of business, including manufacturing, industrial and commercial fields and members of civic groups, the American Legion, labor organizations, educational boards and state employment services.

In each case the chairman of the local committee automatically became a member of a state advisory council. This council included the

commissioner of the state board of education, the director of the state employment service, the commissioner of the department of labor, the president of the state manufacturers' association, representatives of labor, chairman of the state development commission, executive vice president of the state chamber of commerce, commissioner of state welfare and the chairman of the state apprenticeship council.

The committee in each locality was charged with the compilation of figures on age, sex, occupation and previous experience of each individual listed as an employable. Employables were grouped by major industrial classifications, such as manufacturing, construction and trade. Statistics were compiled to show the number of skilled, semi-skilled and unskilled workers, the number of inexperienced youths, the number of persons of professional, supervisory, technical, sales and clerical background and also the number of rehabilitation and retaining cases and unemployables.

In some communities, subcommittees were appointed to assist the local committee. One type, a fact-finding group, was organized to make a further analysis of aptitude; another, to analyze the needs of local industry and to dovetail the requirements of industry, agriculture and general business.

Still another type of subcommittee dealt with public relations, a particularly valuable subcommittee in most communities as it later developed. Its duties included the utilization of appropriate media of publicity to interpret the work of the local committee to employers, employes and unemployed; and to interpret the value of jobs in industry and to often defend, if necessary, the shop job against the white collar job. In this it has been found important to reach the parents, who not infrequently are ambitious to have their children, upon the completion of schooling, get immediately into a white collar job in preference to shop work.

Study at Night

A subcommittee in some cases was organized to set up a course in job-training and also another to look after finances, where conditions were such that funds had to be raised through community effort.

In Connecticut, the governor's commission serves not as a controlling agency, but as an agency to co-operate with the local committees, and to serve actually, as its primary function, as a go-between in the placing of departmental services out of the state, wherever necessary, at the disposal of the local committees.

Training activities are being con-

Chairman of the Connecticut Commission

■ Carl A. Gray, chairman, Connecticut state commission to study employment, is a director and member of the executive committee, Billings & Spencer Co., Hartford, Conn., and has been identified with the steel and metalworking industries since he was graduated from Dartmouth college in 1923.

He started as a helper for the American Steel & Wire Co., Worcester, Mass., the city in which he was born Dec. 12, 1900. Later he worked at the Osgood Bradley Car Co., also of Worcester, and subsequently became vice president in charge of operations of the Capwell Mfg. Co., Hartford, Conn. Later Mr. Gray served as vice president and director of the Whitney Mfg. Co., also of that city.

His interests are diversified, being engaged, in addition to industrial work, in various state, civic and institutional activities. He recently was appointed a member of Governor Baldwin's advisory council for defense, and is ex-officio chairman of the Connecticut commission to study negro employment.

Mr. Gray is a director of the



Carl A. Gray

Hartford Y. M. C. A. and a trustee of Williston academy and was formerly chairman of the executive committee of the Hartford Industrial Foreman's club.

ducted at various trade schools, industrial high schools and, in some cases, in manufacturing plants. Many instructors and much machinery have been donated by manufacturing companies.

The first job-training class was provided with facilities at the state trade school in Hartford and, so as not to interfere with the school's regular day and evening classes, was given a schedule from 11 o'clock at night to 7 o'clock in the morning. This original class received instruction as a group, with all entering training and leaving it at the same time. This method, however, did not prove altogether satisfactory, as it not only presented instruction problems in the handling of so many absolutely green men, but also employment problems, when it came to placing all the men in industry at one time. Consequently, a stagger system has since been employed, admitting a smaller number of new students each week and graduating some each week.

Cost \$17 Per Man

The course, set at 200 hours, called for eight hours a night, 40 hours a week, and this schedule and the curriculum adopted proved so successful that all of the other job-training schools since established in the state to give machine shop training have patterned them. The schedule each week comprises 36 hours of shop instruction and four hours of related instruction. The related class subjects are: (1) reading scale; (2) reading calipers, inside and outside; (3) reading micrometers; (4) understanding symbols and signs on blueprints; (5) sketching, dimensioning and detailing; (6) shop theory.

The approximate time allowed to each machine follows: Power saw, 8 hours; lathe, 72 hours; bench

lathe, 4 hours; surface grinder, 24 hours; drill press, 8 hours; bench, 16 hours; cylindrical grinder, 8 hours; shaper, 24 hours; miller, 24 hours; internal grinder, 8 hours; and tool grinder, 4 hours.

This schedule, of course, varies where it is being specialized to meet some specific need. For aircraft work, for instance, the student spends the major portion of his time on a lathe, with stress placed on accuracy and finish of work.

The experience of Connecticut has been that thoroughly competent beginners entirely satisfactory to the employer, may be turned out at an average cost of \$17 per student-graduate. With increased job-training volume, this per capita cost, it is expected, will be further reduced.

This, it is pointed out, is the actual money-cost figure, and does not include the contributions by business and private industry. Thus it does not include the wages of instructors lent to the job-training schools by private industries. It does, on the other hand, include salaries of school supervisors, assigned from the state department of education. It does not include rental, but does include the costs of power, heat, light and salaries of janitors and cribmen.

The material used in some cases is donated by private industry and in others it is purchased by the job-training schools. In all cases, either already existing machines available for training purposes have been used or additional machines have been lent by private industry.

Since the beginning more than 4000 students have been graduated and all have been placed in jobs. The job-training program in Connecticut now has a capacity of around 1000 graduates a month and this capacity is expected to be further increased soon. A recent sur-

vey indicates that by stepping up production to meet the apparent demands of the national defense emergency the number of graduates can be increased to 15,000 a year, on the basis of existing facilities.

As emergency requirements expand, job-training appears to have unlimited possibilities. The training facilities, however, being geared locally in every instance to local requirements, lend themselves well to moderation, it is pointed out. There is no temptation to over-expansion, as students are trained currently to fit current needs.

Many applicants are on the waiting list. At Hartford, alone, there are more than 1000. The selection of students is in the hands of the state employment service, which interviews and gives tests to all applicants, in addition to surveying carefully previous school and employment records. Incidentally, the successful applicant is advised that completion of the course does not guarantee him a job.

However, to date graduates, as indicated, have found no difficulty in getting placed. In fact, today they are being received with particular welcome by the manufacturers. They do not represent skilled help, but they contribute indirectly to the supply, by relieving pressure at the bottom.

ARSENAL JOB EXPERIENCE, AGE REQUIREMENTS EASED

Age and experience requirements for skilled men needed at Frankford arsenal, Philadelphia, were altered last week in an effort to expedite the hiring of 3000 mechanics. Age limit, recently raised from 50 to 55 years, was again lifted to 62. Applicants likewise need only two years of apprenticeship or its equivalent, compared with the four-year apprenticeship formerly required.

Jobs for more than 7000 additional semiskilled workers will be immediately created at the arsenal if the 3000 skilled men are obtained. Currently fewer than 5000 are employed at Frankford.

Secretary of War Stimson's determination to put into effect a 24-hour three shift, six day week schedule at the plant was responsible for the change in requirements.

Callite Tungsten Corp., Union City, N. J., has acquired the former silk plant of R. & H. Simon Co., in Union City. Additional factory space provided Callite will total about 100,000 square feet.

Manufacturer of tungsten, molybdenum, copper and other alloy products, Callite will consolidate its present branch factories at Newark and North Bergen, N. J., with the main plant at Union City.



Photo, Burton E. Moore Jr.

Job-training class at the state trade school, Hartford, Conn. More than 1000 applicants are on the waiting list

Businessmen Testify at Tax Hearing: Bill Ready For Vote

WASHINGTON

■ HOUSE ways and means committee probably will report out an excess profits tax bill early this week with recommendation for passage.

The committee, with members of the senate finance committee, last week listened to arguments from government officials and businessmen, both for and against the legislation as drafted.

Carl N. Osborne, vice president, M. A. Hanna Co., Cleveland, and vice chairman of the National Association of Manufacturers' finance committee, referred to the heavy costs of national defense and said:

"We are firmly of the belief that business concerns should carry a fair proportion of this tax load. We also recognize that a new excess profits tax—not to be confused with the existing tax levied in conjunction with the capital stock tax—represents a possible means of raising a portion of the additional revenue required by the federal government."

"Almost Wholly Without Precedent"

Mr. Osborne told the committee that "in our efforts to prevent 'profiteering' by taxing at relatively high rates earnings derived from the rearmament of the United States, we are certain that this committee wishes to avoid imposing burdens which will handicap desirable and necessary economic recovery as well as the actual progress of the national defense program. We trust the committee will give favorable consideration to the suggestions we have offered in connection with the pending excess-profits tax measure, and we trust that fundamental revisions in the general tax structure, made all the more necessary through the imposition of this additional tax, may also be given consideration in the near future."

Ellsworth V. Alvord, chairman of the finance committee, United States Chamber of Commerce, said:

"There is no need for extravagant haste in enacting an excess profits tax."

He called attention to the fact that the excess profits tax and the defense plant amortization plan are now linked in a single measure, and said there should be no delay in giving industry permission to deduct from taxable income the cost of such plant expansion.

Mr. Alvord noted that Secretary of War Stimson and Defense Commissioner Knudsen had said early enactment of an excess profits tax

was desirable. He commented that the proposed tax plan was "almost wholly without precedent" and that "potential tax liabilities cannot be ascertained or estimated with reasonable certainty either immediately, or by next March 15, or prior to entering into a defense contract."

Maurice Thorner, Los Angeles attorney, stated that miners of rare metals are attempting to build up an industry for national defense, but the tax would virtually nullify the strategic minerals act designed to stimulate mining in this country. He urged that net income derived from mining minerals be exempted, naming particularly antimony, platinum, tungsten, quicksilver, tin, molybdenum and manganese.

Secretary of the Treasury Morgenthau pointed out that in addition to readjusting the tax structure in a way to speed the production of defense material, the proposed legislation "should also aim at an increase in revenues which will help to strengthen the fiscal position of the treasury."

He told the committee that he is in hearty accord "with the statement made by this committee in its report on the last revenue bill in which you called attention to the need for providing special amortization and for preventing the creation of new war millionaires."

"Since these statements of policy were made, however," Mr. Morgenthau said, "there has risen in the minds of contractors who desire to do business with the government a barrier of uncertainty as to the conditions under which they will operate. In some cases, on this account, contractors have been hesitant to accept government contracts. To remove this hesitancy, it has been my opinion that immediate steps should be taken to obtain adequate remedial legislation."

Secretary of War Stimson and Assistant Secretary of the Navy Compton stated that profit limitations and uncertainty of tax legislation have delayed many vital items of the defense program.

Mr. Knudsen also was a witness before the joint committee. He said that the repealing of the Vinson-Trammell act and provisions for plant expansion has created a feeling that "we are going to have fairly clear sailing from now on." In his opinion the amortization and tax features should be combined in one bill.

Senator Clark, Missouri, said that the pending excess profits tax is merely sugar-coating for a plan

to permit munitions plants to deduct defense expansion costs from their earnings. He made this comment after Assistant Secretary of the Treasury Sullivan had told the committee the proposed bill would yield a net increase of \$190,000,000 in taxes which the government will collect from corporations during 1940.

Mr. Sullivan explained to the committee that the treasury figured the direct yield would be \$225,000,000, of which \$35,000,000 would be offset by a loss on individual income taxes due to the smaller dividends to stockholders. For the years after this year, Mr. Sullivan stated the treasury estimates the excess profits tax net yield to be between \$400,000,000 and \$480,000,000.

Chairman Doughton, of the house ways and means committee, said that major opposition to the proposed bill had failed to develop. During the hearings leaders in the defense program argued for the proposed five-year amortization plan and repeal of provisions of the Vinson-Trammell act which limit profits to 7 and 8 per cent.

Steel's First Half Net Profit Declined 13%

■ Steel industry's net income in first half this year declined 13 per cent from the preceding period, reports from 80 steel companies to the American Iron and Steel institute indicated. According to the institute these companies, which represented about 90 per cent of the industry's capacity, indicated steel's return on capital investment was 2.9 per cent in first half this year, against 3.2 in second half, 1939.

Reporting companies' aggregate net income for period ended June 30 was \$99,780,000 after all charges but before dividends. This compared with net profit totaling \$114,940,000 in second half last year; in first six months, 1939, net income aggregated \$25,450,000.

Should first half earning rate be continued through 1940, annual return on capital investment, estimated at \$4,200,000,000 for the industry, will be about 5.7 per cent the institute reports. That would be less than in 1937, when return was 6.2 per cent. Returns in 1938 and 1939 were 0.5 per cent and 4.2 per cent respectively.

Earnings in 1929, industry's peak year for production, were equal to 9.1 per cent. For decade 1931-40 inclusive earnings, according to the institute, are expected to average 2 per cent.

Taxes paid federal and local governments in first half totaled more than \$78,000,000, compared with nearly \$55,000,000 in first six months last year.

Split Bid Policy Enables Small Firms To Share in Defense Work

WASHINGTON

■ QUARTERMASTER general of the army has informed the co-ordinator of defense purchases, attached to the national defense advisory commission, that two new policies have been adopted in connection with purchases of large quantities of critical and essential items by the quartermaster corps.

The first applies to acceptance of bids on f.o.b. factory or plant basis. Under this policy the government will take delivery at the plant, and the contractor will not have to include transportation in his bid.

The second will permit split bidding. Bidders may now contract for only part of an entire order.

These two policies, worked out by the office of Donald M. Nelson, co-ordinator of defense purchases, and the office of the quartermaster general, will provide a much wider distribution of orders throughout the country, and will enable small enterprises to participate directly in supplying defense requirements. It also will facilitate early deliveries.

Hereafter, bids on large orders may be invited on an f.o.b. factory or plant basis. Awards will be made to the lowest responsible bidders, disregarding cost of transportation from plant or factory to government

destination. No reference will be made to possible destinations. In other words, the invitation will call for a certain quantity f.o.b. plant for shipments to any destination that the government may require.

In all cases where the government is to furnish material, bidders will be informed that such material will be delivered to the plant or factory without expense to the contractor. Government reserves the right to give preference for early deliveries.

Under the new policy of accepting split bids, invitations for bids will advise bidders of the maximum and minimum quantities which may be awarded to any one bidder. No award will be made to any bidder for a quantity in excess of the stated maximum or for less than the stated minimum. Bidders should indicate the minimum quantity for which they are willing to accept an award, since the minimum which the government is willing to consider may be lower than that for which some bidders would be willing to accept. However, no award will be made to any bidder in an amount in excess of any quantity the bidder is capable of manufacturing with present equipment and normal operation within the time limit set forth in the invitation.

Delivery Deadline To Be Primary Factor in Preferential Rating

■ NATIONAL defense advisory commission announced last week that a survey discloses no present need to invoke legal authority to enforce priorities for national defense orders.

The commission, however, requested Assistant Secretary of War Robert P. Patterson, and Assistant Secretary of the Navy Lewis Compton, co-chairmen of the army and navy munitions board, to adopt a system of preference classifications to indicate the order in which contracts are to be fulfilled. The commission has been informed that the priorities committee of the army and navy munitions board will establish rating of contracts by preference classifications within a few days.

Legal authority to enforce such priorities was given the President in an act signed June 28, 1940, which in part provided that

at his discretion army and navy contracts shall take priority over all deliveries for private account or export.

Continuance of the proposed voluntary system depends on complete voluntary co-operation of government and industry.

The system is expected to operate as follows: As far as may be considered necessary, each contract placed with private industry, or each order assigned to arsenals or navy yards, will bear a preference classification, determined and assigned under direction of the army and navy munitions board.

General preference classifications to be employed are: Class AA, reserved for future emergencies of exceptional nature; Class A, consisting of such army and navy orders as require preferred treatment. Each of the above general classifications will in turn be subdivided as far

as may be necessary: For example, AA1, AA2, A1, A2, etc.

In addition to classification each government contract or order also will carry a desired date of delivery, which will be of primary consideration.

A high preference rating does not mean that work on or delivery of orders bearing a lower classification, or orders for private account or export should be delayed, unless necessary to meet the delivery date on the order bearing a superior preference rating.

As long as delivery dates are met details of adjustment will be left to industry. It was stated that the army, navy and defense commission will be ready to assist in such adjustment.

There is little likelihood of shortages in most important materials and equipment used for the munitions program. It was expected that normally supplies would be obtainable through regular purchasing channels and that in most cases the contractor would experience little difficulty in obtaining his requirements from subcontractors and other suppliers.

Helps Contractor Get Supplies

In cases where supplies may prove to be somewhat less readily available it is believed the contractor will be able to make arrangements with his suppliers to fill orders on the scheduled date by calling attention to the preference rating and delivery date on his contract.

If a problem should become acute and the contractor becomes convinced supplies will not flow to him at the required time, he should refer the case to the army and navy munitions board, either directly or through the government inspector.

In cases where the board is unable to adjust the problem, it will be immediately referred to the co-ordinator of national defense purchases.

Urges "No Holdup" in Steel Production

■ Emphasizing steel's importance to national defense, R. J. Wysor, president, Republic Steel Corp., Cleveland, last week told the company's more than 50,000 employes there must be no holdup in steel production during the present emergency.

Addressing Republic's employes through the company's publication, Mr. Wysor urged them to regard themselves in the front line of national defense. With war today a mechanized undertaking fought through the medium of machines, said Mr. Wysor, it is no longer a battle between men, but a battle of machines.

Huge Chrysler Tank Award Tops

Army's \$100,000,000 Week

■ UNITED STATES war department last week announced a list of contracts placed totaling \$45,552,313.43.

This list was issued just prior to the award of a contract to Chrysler Corp., Detroit, for a \$20,000,000 plant and \$33,500,000 worth of tanks. The plant will have 800,000 square feet of floor space and is scheduled to start operations in 13 months, employing 5000. Chrysler is to build and equip the plant and then transfer title to the war department, from which it will lease it on a \$1-a-year basis. British purchasing commission also is expected to place tank orders with Chrysler.

The list issued by the department for the week ended Aug. 14:

Corps of Engineers Awards

Main Steel Inc., South Portland, Me., equipment, \$11,316.
Swanson Boat Oar Factory, Albion, Pa., equipment, \$9203.22.
Link Belt Speeder Corp., Chicago, power shovels, \$302,941.
Ingersoll Rand Co., Washington, compressors, \$5220.
Wallace & Tiernan Co. Inc., Belleville, N. J., water purification units, \$43,480.

Air Corps Awards

Continental Motors Corp., Detroit, engines, \$1,090,894.

Quartermaster Corps Awards

Fargo Motor Corp., Detroit, trucks, \$10,518,435.
Indian Motorcycle Co., Springfield, Mass., motorcycles, \$4700.

Everwear Trunk & Luggage Co., Newark, N. J., mess equipment, \$910.
Metalite Mfg. Co., Los Angeles, mess equipment, \$307.84.
Corbitt Co., Henderson, N. C., trucks, \$1,395,267.69.
General Motors Corp., Chevrolet division, Flint, Mich., trucks, \$9,353,409.98.
Ley Construction Co., Springfield, Mass., oil storage and dispensing system, West-over Field, Mass., \$8625.
Chas. T. Main, Boston, Mass., and Fred T. Ley & Co., Springfield, Mass., building at Springfield armory, \$695,000.
Folino & Twisdale, Watertown, N. Y., storage building, Madison Barracks, N. Y., \$15,482.
Fargo Motor Corp., Detroit, light sedan cars, \$461,620.

Ordnance Department Awards

Lansdowne Steel & Iron Co., Morton, Pa., ammunition parts, \$10,769.
American Brass Co., Waterbury, Conn., ammunition parts, \$1486.31.
Electric Auto-Lite Co., Toledo, O., ammunition parts, \$3300.
American Brass Co., Waterbury, Conn., small arms ammunition, \$153,353.
W. L. Maxson Corp., New York, artillery materiel parts, \$106,589.50.
Mergenthaler Linotype Co., Brooklyn, N. Y., artillery materiel parts, \$231,333.65.
Bausch & Lomb Optical Co., Rochester, N. Y., artillery materiel parts, \$53,890.20.
Pratt & Whitney, division of Niles-Bement-Pond Co., West Hartford, Conn., lathes, \$4146.
Brown & Sharpe Mfg. Co., Providence, R. I., grinders, \$28,117.
Vandyck-Churchill Co., Philadelphia, grinders, \$5151.50.
Peters Engineering Co., Philadelphia, machinery, \$6038.

National Acme Co., Cleveland, machines, \$35,272.60.
McKenna Metals Co., Latrobe, Pa., tools, \$1546.
Barth Stamping & Machine Works, Cleveland, tools, \$5574.
Engineering Tool Corp., Philadelphia, tools, \$10,902.
General Tools Sales Co., Philadelphia, tools, \$1177.40.
American Cutter & Eng. Co., Detroit, tools, \$2704.
Carbide Tool Co., Chicago, tools, \$4051.56.
Stevens Walden Inc., Worcester, Mass., punches, \$4838.
Union Twist Drill Co., Athol, Mass., tools, \$4483.03.
Landis Tool Co., Waynesboro, Pa., grinders, \$23,670.
Norton Co., Worcester, Mass., grinders, \$5961.
Hendey Machine Co., Torrington, Conn., lathes, \$18,800.
B. Jahn Mfg. Co., New Britain, Conn., dies, \$5770.
Putnam Tool Co., Detroit, tools, \$2471.25.
C. S. Blakelee & Co., Cicero, Ill., machinery, \$2414.60.
Towmotor Co., Cleveland, trucks, \$3440.50.
Kearney & Trecker Corp., Milwaukee, machinery, \$37,450.
Steel Weld Machinery division, Cleveland Crane & Engrg. Co., Wickliffe, O., machinery, \$11,113.
E. L. Essley Machinery Co., Chicago, machinery, \$19,209.
Pangborn Corp., Hagerstown, Md., machines, \$1758.
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, machines, \$23,491.80.
Jones & Lamson Machine Co., Springfield, Vt., machines, \$28,835.
A. B. Farquhar Co. Ltd., York, Pa., hydraulic presses, \$3290.
National Acme Co., New York, machinery, \$12,305.40.
Lyon Metal Products Inc., Aurora, Ill., cabinets, \$4626.86.
Vandyck-Churchill Co., New York, machines, \$6513.
Ingersoll-Rand Co., Newark, N. J., compressors, \$3149.
H. F. Allen Co. Inc., New York, machinery, \$2645.
Morgan Machine Co. Inc., Rochester, N. Y., machinery, \$2401.
Reliable Tool Co., Irvington, N. J., tools, \$6726.50.
Braeburn Alloy Steel Corp., Braeburn, Pa., tool steel, \$1132.37.
Diamant Tool & Supply Co., Newark, N. J., tools, \$1886.
General Machinery Corp., Hamilton, O., lathes, \$172,500.
Austin-Hastings Co. Inc., Cambridge, Mass., shapers, \$12,561.80.
Gleason Works, Rochester, N. Y., machines, \$20,532.
Alton Iron Works, New York, tool steel, \$1290.21.
Cutter, Wood & Sanderson Co., Cambridge, Mass., machinery, \$3308.79.
Peterson Bros. Tool Co., Milford, Mass., gages, \$1210.
Barker Tool Die & Gauge Co., Detroit, gages, \$1070.
Hanson-Whitney Machine Co., Hartford, Conn., gages, \$1934.65.
Chase Brass & Copper Co., Waterbury, Conn., ammunition parts, \$2,765,018.
Norris Stamping & Mfg. Co., Los Angeles, ammunition parts, \$356,166.
Revere Brass & Copper Co., Waterbury, Conn., ammunition parts, \$25,000.
Peco Mfg. Co., Philadelphia, containers, \$3085.
American Brass Co., Waterbury, Conn., ammunition parts, \$168,745.
Carnegie Illinois Steel Co., Philadelphia, rolled steel bars, \$65,400.
Edgcomb Steel Co., Philadelphia, strip steel, \$1485.98.
American Forge division of American Brake Shoe & Foundry Co., Chicago,

Washington May Systematize Lists

■ THREE departments of the federal government are issuing lists of contracts awarded; namely, war and navy departments, and the labor department's public contract division which administers the Walsh-Healey act.

The Walsh-Healey lists include contracts involving \$10,000 or more, placed by various government departments. Apparently they do not include all the war and navy departments' contracts for over \$10,000.

On the other hand, the lists issued by the war and navy departments include all or most of their contracts, in various sums.

By scanning these lists as issued weekly STEEL endeavors to avoid duplications, while providing a timely record of contracts pertaining to ferrous and nonferrous metals, equipment and principal construction activities.

The lists issued by the three de-

partments—embracing work, materials and products of all descriptions—now are so voluminous, and public interest in them so widespread that an effort at last is being made to have some government department assemble and check them at the source, a much-needed system to avoid misunderstanding and confusion.

The production division of the national defense advisory commission at irregular intervals issues lists of war and navy departments' contracts of \$500,000 or more as "cleared" or approved, by the commission.

The advisory commission does not make or sign contracts. This is the function of the war and navy departments. The contracts listed by the commission as "cleared" may or may not have been signed by the heads of these departments; when signed they appear in the war and navy lists.

forgings, \$62,400.
 Budd Wheel Co., Detroit, ammunition parts, \$1,198,339.50.
 Waltham Watch Co., Waltham, Mass., ammunition parts, \$4250.
 Acklin Stamping Co., Toledo, O., ammunition parts, \$3723.51.
 Aluminum Co. of America, Washington, ammunition parts, \$33,000.
 Remington Arms Co. Inc., Bridgeport, Conn., ammunition parts, \$55,000.
 American Steel and Wire Co., Philadelphia, steel, \$1340.
 Monsanto Chemical Co., St. Louis, ammunition parts, \$18,482.40.
 Mack Molding Co. Inc., Wayne, N. J., ammunition parts, \$1400.
 Fort Pitt Bedding Co., Pittsburgh, ammunition parts, \$9664.
 Federal Screw Works, Detroit, ammunition parts, \$19,725.
 Eastern Tool & Mfg. Co., Bloomfield, N. J., ammunition parts, \$3270.12.
 Belvidere Screw Co., Belvidere, Ill., ammunition parts, \$1412.52.
 McLaren Screw Products Co., Detroit, ammunition parts, \$6926.64.
 Russakov Can Co., Chicago, ammunition parts, \$6750.
 Thorrez & Mace Mfg. Co., Jackson, Mich., ammunition parts, \$5330.
 Mitchell Metal Products Inc., Cleveland, packing crates, \$45,400.
 Reynolds Metals Co., Louisville, Ky., aluminum, alloy rod, \$15,428.
 Sperry Gyroscope Co., Brooklyn, N. Y., equipment, \$594,103.
 Struthers-Wells-Titusville Corp., Titusville, Pa., forgings, \$65,783.48.
 Adirondack Foundries and Steel Inc., Watervliet, N. Y., castings, \$4327.50.
 Keuffel & Esser Co., New York, equipment, \$884,263.80.
 Bausch & Lomb Optical Co., Rochester, N. Y., equipment, \$1,094,080.
 E. G. Kelley Inc., Philadelphia, equipment, \$18,290.05.
 W. & L. E. Curley Co., Troy, N. Y., equipment, \$255,312.
 Wheland Co., Chattanooga, Tenn., guns, \$912,800.
 Park City Blinding Co. Inc., Bridgeport, Conn., gun accessories, \$1712.62.
 Lite Mfg. Co., New York, gun accessories, \$5546.56.
 Warner Electric Brake Mfg. Co., Beloit, Wis., equipment, \$7209.15.
 Timken-Detroit Axle Co., Detroit, parts of artillery carriages, \$779,710.35.
 Karp Metal Products Co., Brooklyn, N. Y., radio cabinets, \$20,461.
 Cleveland Tractor Co. Cleveland, tractors, \$35,430.48.
 The BG Corp., New York, spark plugs, \$11,592.
 Continental Motors Corp., Muskegon, Mich., pistons, \$5292.
 Burgess-Norton Mfg. Co., Geneva, Ill., block bodies, \$37,632.
 Titeflex Metal Hose Co., Newark, N. J., metal tubing, \$1711.50.
 American Steel Foundries, Chicago, block pins, \$26,280.96.
 Revere Copper and Brass Inc., Baltimore, ammunition parts, \$855,233.
 Winchester Repeating Arms Co. division Western Cartridge Co., New Haven, Conn., ammunition, \$5569.
 Western Cartridge Co., Easton Alton, Ill., ammunition, \$144,831.50.
 American Brass Co., Waterbury, Conn., ammunition parts, \$91,617.
 Superior Sheet Steel Co., Park & Williams, representatives, Philadelphia, sheets, plate, \$30,000.
 Unexcelled Mfg. Co., New York, ammunition, \$113,300.
 Lapoint Machine Tool Co., Hudson, Mass., machines, \$3750.
 Marshall & Huschart Machinery Co., Chicago, machines, \$24,152.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., machines, \$11,500.
 De Lisser Machine & Tool Corp., New York, tools, \$6180.
 Stevens Welden Inc., Worcester, Mass., tools, \$4665.
 Foote-Burt Co., Cleveland, machines, \$12,875.
 Swind Machinery Co., Philadelphia, machines, \$19,965.
 Henry & Wright Mfg. Co., Hartford, Conn., machines, \$23,275.
 S. W. Bliss Co., Brooklyn, N. Y., presses, \$8200.
 F. C. Castelli Co., Philadelphia, tools, \$1655.
 Dewalt Products Corp., Lancaster, Pa., cutters, \$1825.
 Keenan Supply Co., Philadelphia, quenching tanks, \$8680.
 Norton Co., Worcester, Mass., grinding wheels, \$1226.
 U. S. Tool Co. Inc., Ampere, East Orange, N. J., machines, \$6814.50.
 Producto Machine Co., Bridgeport, Conn., machines, \$5900.
 McKenna Metals Co., Latrobe, Pa., tools, \$3252.
 Kingsbury Machine Tools Corp., Keene, N. H., machines, \$54,259.
 Leland-Gifford Co., Worcester, Mass., machines, \$1830.
 LaPointe Machine Tool Co., Hudson, Mass., machines, \$10,115.
 National Broach and Machine Co., Detroit, machines, \$102,560.
 Brown and Sharpe Mfg. Co., Providence, R. I., machines, \$16,675.03.
 Ex-Cell-O Corp., Detroit, machines, \$1137.
 Federal Machinery Sales Co., Chicago, presses, \$4660.
 Mercury Mfg. Co., Chicago, tractor, \$1089.
 Earle Hart Woodworking Machine Co., Chicago, machines, \$2400.
 Warner & Swasey Co., Chicago, lathes, \$102,835.50.
 Landis Machine Co., Waynesboro, Pa., machines, \$3615.62.
 American Air Filter Co., Louisville, Ky., dust collecting systems, \$1992.
 Mid-West Dynamometer and Engraving Co., Chicago, dynamometers, \$2520.
 Tannewitz Works, Grand Rapids, Mich., machines, \$2400.
 John J. Normoyle Co., Moline, Ill., machines, \$5868.12.
 Oliver Machinery Co., Grand Rapids, Mich., bench saws, \$3069.90.
 Cullen-Friedstedt Co., Chicago, welding manipulators, \$6586.80.
 Brown & Sharpe Co., New York, lathes, grinders, \$38,722.51.
 Proctor & Schwartz, Philadelphia, dryers, \$9220.
 Speciality Engineering Co., Philadelphia, conveyor system, \$6990.
 Continental Machine Inc., Minneapolis, machines, \$2665.
 E. W. Bliss Co., Brooklyn, N. Y., presses, \$1750.
 Belke Mfg. Co., Chicago, plating racks, \$2001.
 Diamant Tool & Mfg. Co., Newark, N. J., fixtures, \$2283.
 Hall Planetary Co., Philadelphia, thread miller, \$5589.
 Triplex Machine Tool Corp., New York, grinders and presses, \$5319.
 Kingsbury Machine Tool Corp., Keene, N. H., drilling machines, \$102,943.
 Carrier Corp., New York, drying system trays, \$6458.
 Trustees of Dover Boiler Works, Dover, N. J., machines, \$5085.
 Hanson-Whitney Machine Co., Hartford, Conn., tools, \$3171.
 Vanadium Alloys Steel Co., Philadelphia, tools, \$2712.
 Tungsten Electric Co., Union City, N. J., tools, \$1956.60.
 Carbide Tool Co., Chicago, tools, \$2872.18.
 Heald Machine Co., Worcester, Mass., grinders, \$14,926.
 Monarch Machine Tool Co., Sidney, O., lathes, \$36,012.
 G. A. Gray Co., Cincinnati, planers, \$43,884.
 Kearney & Trecker Corp., Milwaukee, milling machines, \$72,429.65.
 Ampeco Twist Drill Co., Philadelphia, reamers, \$1150.
 Lloyd & Arms Co., Philadelphia, lathes, \$20,185.
 Engineering Tool Corp., Philadelphia, tools, \$3763.65.
 Peters Engineering Co., Philadelphia, dies, \$1050.
 Barber-Colman Co. Machine & Small Tool divisions, Rockford, Ill., tools, \$2654.40.
 B. M. Root Co., York, Pa., machines, \$10,101.
 R. W. Wilhelm Die, Tools & Machine Co., Pittsburgh, tools, \$1230.
 Hamilton Caster & Mfg. Co., Hamilton, O., dump trailers, \$1825.
 J. F. Johnson & Co. Philadelphia, tools, \$1941.
 National Acme Co. New York, tools & machines, \$106,185.94.
 Sellow Machine Tool Co., Pawtucket, R. I., machines, \$9400.
 Philadelphia Drying Machinery Co., Philadelphia, dryers and trucks, \$6779.
 Eclipse Air Brush Co. Inc., Columbus, O., machines, \$4040.
 Exact Weight Scale Co., Columbus, O., scales, \$6300.
 Vandyck-Churchill Co., New York, machines, \$4448.
 Aluminum Co. of America, Washington, containers, \$60,108.
 Mixing Equipment Co. Inc., Rochester, N. Y., mixers, \$3576.
 Separations Engineering Corp., New York, equipment, \$4055.
 Jones & Lamson Machine Co., Springfield, Vt., grinders, \$14,519.50.
 Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, machines, \$83,237.35.
 Thompson Grinder Co., Springfield, O., machines, \$15,800.
 Henry Prentiss & Co. Inc., New York, machines, \$87,972.
 General Electric Co., Federal and Marine department, Schenectady, N. Y., planers, \$5946.
 Warner & Swasey Co., Cleveland, lathes, \$14,487.50.
 Rivett Lathe & Grinder Inc., Boston, machines, \$3727.50.
 Van Dyck-Churchill Co., New York, machines, \$112,929.
 Industrial Engineering Equipment, Davenport, Iowa, motor-generator sets, \$1978.
 Austin-Hastings Co., Cambridge, Mass., lathes, hack saws, \$73,952.14.
 Vulcan Mold & Iron Co., Latrobe, Pa., tools, \$3488.50.
 Rivett Lathe & Grinder, Brighton, Mass., lathes, \$7373.
 Peterson Bros. Tool Co., Milford, Mass., gages, \$2567.
 Greenfield Tap and Die Corp., Greenfield, Mass., gages, \$7771.52.
 Pratt & Whitney Division Niles-Bement-Pond Co., Hartford, Conn., gages, \$7083.48.
 Brust Tool Mfg. Co., Chicago, gages, \$1167.
 Bohn Aluminum & Brass Corp., Detroit, ammunition components, \$48,845.50.
 American Cyanamid Co., Calco Chem. division, Bound Brook, N. J., ammunition components, \$23,000.
 Robertshaw Thermostat Co., Youngwood, Pa., ammunition components, \$270,249.
 Winchester Repeating Arms Co., division of Western Cartridge Co., New Haven, Conn., ammunition components, \$4940.
 Scovill Mfg. Co., Waterbury, Conn., ammunition components, \$102,410.
 E. I. duPont de Nemours & Co. Inc., Wilmington, Del., ammunition components, \$34,815.
 General Chemical Co., New York, ammunition components, \$10,720.
 Thomas B. Gibbs & Co., Chicago, ammunition components, \$37,500.
 Westclox division of General Time Instruments Corp., LaSalle, Ill., ammunition components, \$4373.40.
 American Brass Co., Waterbury, Conn.,

ammunition components, \$27,149.
 Gilbert & Barker Mfg. Co., Springfield, Mass., equipment, \$443,037.12.
 Safety Car Heating & Lighting Co. Inc., New York, equipment, \$129,396.09.
 Keuffel & Esser Co., Hoboken, N. J., equipment, \$718,727.60.
 Eastman Kodak Co., Rochester, N. Y., equipment, \$25,290.30.
 Worthington Pump & Machinery Corp., New York, N. Y., pumps, \$15,972.
 Electric Arc Cutting & Welding Co., Newark, N. J., electric arc welders, \$2495.
 H. F. Allen Co. Inc., New York, shapers, \$10,888.
 Condenser Service & Engrg. Co., Hoboken, N. J., condensers, \$10,596.
 General Electric Co., Schenectady, N. Y., turbines, \$96,946.
 Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., bench miller, \$2515.
 Logansport Machine Inc., Logansport, Ind., presses, \$10,200.
 Leeds & Northrup Co., Philadelphia, furnaces, \$1759.30.
 Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., gage block sets, \$2160.
 Stromberg Time Corp., Des Moines, Iowa, time-recorders, \$1700.
 Barber-Colman Co., Rockford, Ill., hobbling machines, \$2221.60.
 Continental Machines Inc., Minneapolis, cutting-off machines, \$2483.30.
 American Foundry Equip. Co., Mishawaka, Ind., sandblast barrels, \$3509.
 Machinery & Welder Corp., Moline, Ill., electric welders, \$1244.50.
 R. S. Wilder Inc., Waltham, Mass., micro projectors, \$4329.60.
 Cincinnati Milling Machines & Cincinnati Grinders Inc., Cincinnati, milling machines, \$29,696.
 W. S. Rockwell Co., New York, furnaces, \$51,802.
 Stanley P. Rockwell Co., Hartford, Conn., furnaces, \$3456.
 W. E. Shipley Machy. Co., Philadelphia, lathes, \$1597.
 Rockford Machine Tool Co., Rockford, Ill., shapers, \$10,031.60.
 Wiedmann Machine Co., Philadelphia, gages, \$11,210.50.
 Lansdowne Steel & Iron Co., Morton, Pa., forgings, \$133,518.25.
 National Tube Co., Pittsburgh, forgings, \$52,276.75.
 General Electric Co., Federal & Marine department, Schenectady, N. Y., equipment, \$201,090.04.
 American Locomotive Co., New York, artillery carriages, \$1,132,200.
 High Speed Hammer Co. Inc., Rochester, N. Y., machines, \$8361.25.
 Gardner Dever Co., New York, compressors, \$6430.
 Stanley P. Rockwell Co., Hartford, Conn., furnaces, \$25,861.
 Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, grinders, \$7730.25.
 Armstrong-Blum Mfg. Co., Chicago, saws, \$2112.33.
 W. F. Hebard & Co., Chicago, cranes, \$3395.
 The E. L. Essley Machinery Co., Chicago, machines, \$28,123.
 Federal Machinery Sales Co., Chicago, presses, \$13,407.
 Thompson Gibb Electric Welding Co., Lynn, Mass., machines, \$4800.
 Earle Hart Woodworking Machine Co., Chicago, saws, \$1679.
 Precise Tool & Mfg. Co., Farmington, Mich., gages, \$2917.50.
 Langlois Gage Co., Detroit, gages, \$2633.
 Taft-Pierce Co., Woonsocket, R. I., gages, \$1650.
 West & Dodge Thread Gauge Co. Inc., Boston, gages, \$2094.63.
 Electrical Engineers Equipment Co., Philadelphia, artillery materiel, \$3085.
 American Broach & Machine Co., Ann Arbor, Mich., machines, \$4288.
 Brown and Sharpe Mfg. Co., Provi-

Purchases Under Walsh-Healey Act

(In week ended Aug. 3)

Iron and Steel Products

	Commodity	Amount
Maine Steel Inc., South Portland, Me.	Fittings, rope	\$38,844.40
Hunter Steel Co., Pittsburgh	Support towers	42,825.00
Wirt Co., Philadelphia	Battery cups	15,500.00
Eclipse Aviation, Bendix, N. J.	On-carriage parts	14,860.00
Bethlehem Steel Co., San Francisco	Reinforcing steel	44,454.00
Bethlehem Steel Export Corp., New York	Structural steel	135,771.35
Austin-Hastings Co. Inc., Cambridge, Mass.	Hack saws	13,952.14
Legion Utensils Corp., Long Island City, N. Y.	Meat platters	14,850.00
Onelda Ltd., Onelda, N. Y.	Tableware	78,347.00
Vollrath Co., Sheboygan, Wis.	Water pitchers	40,700.00
Wm. Scrimgeour, Washington	Tableware	32,750.00
Richmond Radiator Co. Inc., Uniontown, Pa.	Baskets, trays	10,314.75
Crane Co., Washington	Steel valves	32,311.60
John Van Range Co., Cincinnati	Kitchen equipment	†45,160.42
Noland Co. Inc., Washington	Plumbing fixtures	15,490.50
Pfaunder Co., Rochester, N. Y.	Reactor units	23,940.00
Budd Wheel Co., Detroit	Shell	1,243,051.50
Norwalk Lock Co., New York	Shot	125,998.19
Aetna-Standard Engineering Co., Youngstown, O.	Gun carriages	3,302,139.67
Koppers Co., Baltimore	Gun carriages	3,725,930.00
Dunham, Carrigan & Hayden Co., San Francisco	Files	12,960.10
International Silver Co., New York	Tableware	16,805.00
Jessop Steel Co., Washington	Steel	27,445.00
Charles Fischer Spring Co., Brooklyn, N. Y.	Rifle parts	17,128.35
Bay State Tool & Machine Co., Springfield, Mass.	Rifle parts	34,136.64
McKay Co., Pittsburgh	Buoy chain	14,709.56
Tippett & Wood, Phillipsburg, N. J.	Buoys	16,132.80
Kliby Steel Co., Anniston, Ala.	Shell forgings	113,228.62
Line Material Co., Milwaukee	Shell	104,432.49
Burgess-Norton Mfg. Co., Geneva, Ill.	Bodies	37,632.00
American Steel Foundries, Chicago	Pins	26,280.96
Crosby Co., Buffalo	Reels	55,682.55

Nonferrous Metals and Alloys

C-O-Two Fire Equipment Co., Newark, N. J.	Fire extinguishers	\$118,978.65
Revere Copper & Brass Inc., Baltimore	Brass strip	*113,027.62
Whitehead Metal Products Co. Inc., Philadelphia	Nickel	53,520.00
Aluminum Co. of America, Washington	Aluminum-alloy	50,844.61
International Nickel Co. Inc., New York	Nickel-copper alloy	*145,742.33
Aluminum Products Co., La Grange, Ill.	Aluminum pots	90,200.00
American Smelting & Refining Co., Baltimore	Zinc dust	42,400.00
M. Swift & Sons Inc., Hartford, Conn.	Gold leaf	†10,856.00
Aluminum Cooking Utensil Co., New Kensington, Pa.	Steam kettles	16,404.23
International Minerals & Metals Corp., New York	Zinc slab	44,927.80
New Jersey Zinc Sales Co. Inc., New York	Zinc	36,001.45
Atlantic Zinc Works Inc., Brooklyn, N. Y.	Zinc	46,213.18
American Brass Co., Waterbury, Conn.	Bullet cups, disks	*672,284.46

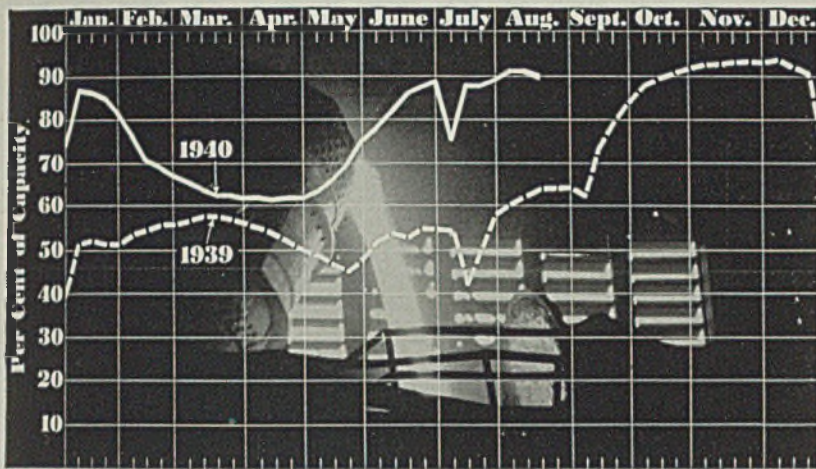
Machinery and Other Products

American Bosch Corp., Springfield, Mass.	Engine parts	\$15,406.00
Ralph B. Carter Co., Hackensack, N. J.	Mech. flocculators	13,281.00
Bodine Corp., Bridgeport, Conn.	Tapping machine	11,895.00
W. E. Shipley Machinery Co., Philadelphia	Screw machines	22,215.00
American Chain & Cable Co. Inc., York, Pa.	Chain hoists	16,188.41
Austin-Hastings Co. Inc., Cambridge, Mass.	Drill lathe	70,844.00
Emil Brown & Co., Los Angeles	Kitchen equipment	53,947.52
Harnischfeger Corp., Milwaukee	Bridge cranes	41,960.00
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.	Cranes	175,400.00
Louden Machinery Co., Philadelphia	Cranes	19,273.00
Pennsylvania Pump & Compressor Co., Easton, Pa.	Air compressor	12,791.00
R. W. Kallenbach Corp., Bedford, O.	Gantry crane	95,600.00
Ellis Drier Co., Chicago	Laundry equipment	52,847.00
I. J. White Co., New York	Bakery equipment	21,685.00
Federal Mfg. Co., Brooklyn, N. Y.	Kitchen equipment	41,827.00
Ingersoll-Rand Co., Washington	Air compressors	68,628.60
Henry G. Dupree, Jacksonville, Fla.	Plant equipment	267,664.44
Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.	Dish washers	†19,808.25
Northwest Engineering Co., Chicago	Excavator	15,940.00
Bullard Co., Bridgeport, Conn.	Boring mill	20,467.00
Sebastian Lathe Co., Cincinnati	Lathes	36,851.25
Singer Sewing Machine Co., Philadelphia	Sewing machines	24,190.00
C. F. Bulotti Machinery Co., San Francisco	Twist drills	45,784.05
Rockford Machine Tool Co., Rockford, Ill.	Planer	11,831.90
Worthington Pump & Machinery Corp., Harrison, N. J.	Pumps, engines	114,838.00
Morris Machine Works, Baldwinville, N. Y.	Pumps, engines	15,262.00
Hobart Mfg. Co., Troy, O.	Kitchen equipment	†54,779.31
Frick Co. Inc., Waynesboro, Pa.	Refrigerating plants	43,400.00
Gisholt Machine Co., Madison, Wis.	Turret lathe	14,604.00
Baldwin Locomotive Works, Philadelphia	Hydraulic press	268,010.00
Midwest Piping & Supply Co. Inc., St. Louis	Flanging machine	16,595.00
Brown & Sharpe Mfg. Co., Providence, R. I.	Lathe, mill, mach.	61,119.88
Harris Seybold Potter Co., Cleveland	Offset press	20,160.00
G. A. Gray Co., Cincinnati	Planers	43,884.00
Heald Machine Co., Worcester, Mass.	Grinder	14,926.00
Monarch Machine Tool Co., Sidney, O.	Lathes	36,012.00
E. L. Essley Machinery Co., Chicago	Grinders	15,351.00
Cleveland Crane & Engine Co., Wickliffe, O.	Brake	11,113.00
Cincinnati Mill. Mach. & Cn. Grinders Inc., Cincinnati	Milling machines	23,491.80
Kearney & Trecker Corp., Milwaukee	Milling machines	72,430.15

Grand Total

\$12,917,186.48

*Estimated. †Purchases to be made if and when needed.



PRODUCTION... Down

■ STEELWORKS operations last week declined $\frac{1}{2}$ -point to 90 per cent. Four districts made slight gains and two declined because of vacation idleness and furnace repair. In six districts the rate was unchanged. A year ago production was at 63.5 per cent; two years ago it was 41.5 per cent.

Youngstown, O.—Addition of three open hearths and enlarged bessemer production increased the rate 4 points to 86 per cent, with this week's schedule at about the same rate. Active open hearths number 67, Republic Steel Corp. resuming with furnaces which were down for repairs.

Birmingham, Ala.—Held at 88 per cent for the third week, 21 open hearths in production.

Chicago—Advanced 1 point to 97 $\frac{1}{2}$ per cent, highest mark in more than 11 years.

Detroit—Shutdown of another open hearth lowered the rate 4 points to 89 per cent, leaving 23 of 26 furnaces active.

St. Louis—Addition of four open hearths increased the rate 15 points to 77.5 per cent, the highest since January, when 83 per cent was reached. An East Side mill has scheduled two more open hearths before the end of August.

Central eastern seaboard—Steady at 89 per cent, a leading producer operating above theoretical capacity, using purchased semifinished steel.

Buffalo—Two furnaces forced out for repairs were balanced by two others added, the rate remaining at 88 $\frac{1}{2}$ per cent.

Wheeling—Maintained 99 per cent production for the second week.

Pittsburgh—Dropped 6 points to 80 per cent, one large plant being idle for vacation. Partial recovery is expected this week.

New England—Held at 80 per cent for the third week, with possibility of an increase this week.

Cincinnati—Unchanged at 78 per cent, with little variation indicated for this week.

Cleveland—An increase of 1 point to 86 per cent will be held or bettered this week.

Steel Corp. Shipments Up 7.2 Per Cent in July

■ United States Steel Corp.'s finished steel shipments in July amounted to 1,296,887 net tons, an increase of 87,203 tons, 7.2 per cent, over 1,209,684 tons in June, and 551,523 tons, approximately 74 per cent, over 745,364 tons shipped in June, 1939.

For seven months this year shipments were 7,585,285 tons, compared with 5,583,768 tons in the period in 1939, an increase of 2,001,517 tons, or 35.8 per cent.

Vacations Cut Into Machine Tool Output

■ Machine tool builders' operations in July averaged 88.3 per cent of

capacity, compared with 92.3 per cent in June, according to the National Machine Tool Builders' association, Cleveland. July, 1939, operations were at 65.8 per cent. Vacation schedules during the month account for a decrease.

Capacity of the industry, measured in payroll hours, has increased steadily and at the end of July stood at 129.9 per cent, based on capacity in September, 1939.

Gear Sales in July Increase 9.3 Per Cent

■ Gear sales in July were 9.3 per cent above June, and 58 per cent larger than in July, 1939, according to American Gear Manufacturers association, Wilkensburg, Pa. Sales for seven months this year were 38 per cent more than in the period in 1939. Comparative index figures:

	1940	1939
January	123	91
February	116	86
March	114	104
April	128	88
May	133	93
June	129	90
July	141	89

Average monthly index figure for first seven months this year is 126, compared to 92 for the period in 1939.

July Sales of Industrial Electric Trucks at Peak

■ July sales of industrial electric trucks totaled 151 units, a record for the current year according to Industrial Truck Statistical association, Chicago. Previous peak was 120 units in April. Value at factories for chassis only was \$591,784.44, compared with \$423,381.50 in April.

July sales included six non-elevating platform trucks, net chassis value at factories, \$10,805; 126 cantilever trucks, net value, \$496,632.44; 13 crane trucks, net value, \$59,490; six special trucks, \$24,857.

District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts	Week ended		Same week	
	Aug. 17	Change	1939	1938
Pittsburgh	80	- 6	56	30
Chicago	97.5	+ 1	58	36
Eastern Pa.	89	None	43	30
Youngstown	86	+ 4	55	43
Wheeling	99	None	86	54
Cleveland	86	+ 1	83.5	41
Buffalo	88.5	None	58	44
Birmingham	88	None	75	53
New England	80	None	70	50
Cincinnati	78	None	60	65
St. Louis	77.5	+15	57	36
Detroit	89	- 4	82	52
Average	90	- 0.5	63.5	41.5

U. S. Steel's Shipments

(Inter-company shipments not included)

	Net Tons			
	1940	1939	1938	1937
Jan.	1,145,592	870,866	570,264	1,268,403
Feb.	1,009,256	747,427	522,395	1,252,845
March	931,905	845,108	627,047	1,563,113
April	907,904	771,752	550,551	1,485,231
May	1,084,057	795,689	509,811	1,443,477
June	1,209,684	807,562	524,994	1,405,078
July	1,296,887	745,364	484,611	1,315,353
Aug.		885,636	615,521	1,225,907
Sept.		1,086,683	635,645	1,161,113
Oct.		1,345,855	730,312	875,972
Nov.		1,406,205	749,328	648,727
Dec.		1,443,969	765,868	539,553

Total, by	1940	1939	1938	1937
Months	11,752,116	7,296,347	14,184,772	
Adjustment	*44,865	129,159	*87,106	
Total	11,707,251	7,415,506	14,097,666	

†Increase. *Decrease.

Windows of WASHINGTON



By L. M. LAMM

Washington Editor, STEEL

Bill Giving President Requisition Powers Introduced.

Would Include All Materials Necessary for Defense.

Green Opposes Proposed House Labor Amendments.

TNEC Completes Study of Production Concentration.

■ INTRODUCED in the house last week by Representative Faddis, Pennsylvania, H. R. 10339 would authorize the President to requisition certain articles and materials for use by the federal government. The bill was referred to the house committee on military affairs which approved it late last week.

It provides that whenever the President determines it necessary, in the interest of national defense, to take over for operation by the United States any military equipment or munitions, machinery, tools, or materials necessary for their manufacture, servicing or operation he be empowered to requisition any of the foregoing articles or materials.

The bill further provides that whenever the President shall requisition any article or material pursuant to the act's provisions, the owner shall be paid a sum determined by the President to be fair and just. If any owner is unwilling to accept, as complete compensation, the sum determined by the President, he shall be paid 50 per cent of that amount and shall be entitled to sue the United States for such additional sum as, when added to that already received, he may consider fair and just compensation.

Authority granted in this act would terminate June 30, 1942.

William Green, president, American Federation of Labor, appeared last week in executive session be-

fore the senate labor committee which is studying proposed amendments to the national labor relations act. Committee members quoted Mr. Green as saying he would rather leave the board as it is than see the senate enact amendments already passed by the house.

Senator Thomas, committee chairman, and Senator Ellender, Louisiana, described Mr. Green's testimony after the labor group had heard him in closed session.

Each committee member present, Senator Ellender said, had been under the impression Mr. Green had supported the house amendments in full. However, Senator Ellender related, Mr. Green told the committee the A. F. of L. had acquiesced in all the proposals in hope of defeating in the senate those portions which the organization opposed.

Senators Thomas and Ellender reported Mr. Green expressed opposition to provisions which would replace the present labor board with a new three-man body and would vest administrative powers in a single administrator.

Mr. Green, it was further reported, advocated retaining the present board with addition of two new members and leaving the present powers of the agency undivided.

The A. F. of L. president also opposed the definition of agricultural labor approved by the house, Senator Thomas told reporters, on the ground it would remove from jurisdiction of the act between 300,000

and 400,000 workers in processing plants, elevators and farm-to-market trucking operations.

Members said Mr. Green also asked no limitation be made on the back pay allowed workers reinstated after a strike.

Joint study has been made by the temporary national economics committee and the bureau of foreign and domestic commerce in connection with concentration of production in manufacturing.

It is reported 1807 manufactured products were analyzed. All manufacturing activities, almost half the total number of products listed in the 1937 census of manufactures and slightly more than half of the total value of all manufactured commodities reported were represented. Although coverage is not complete, many of the analyzed products are of critical or strategic importance.

Included in the data developed is the proportion of the total value and quantity of each product accounted for by the leading four producers of that product. This was expressed as a concentration ratio for value and for quantity. For example, the concentration ratio for heavy duty lathes was 100 per cent. This means that four firms produced all the heavy duty lathes turned out in the United States in 1937.

DEFENSE COMMISSION MEMBERS APPOINT AIDES

Ralph Budd, member of the national defense advisory commission in charge of co-ordinating transportation, has announced appointment of Charles Gordon, managing director, American Transit association, as advisor on transportation in connection with the national defense program.

Edward Stettinius Jr., in charge of raw materials, last week reported Harry Slattery was appointed consultant to the subcommittee on electric power problems. Mr. Slattery

Do YOU KNOW WHERE all skilled wages go?

A breakdown of production costs to show the time spent in handling materials reveals the actual number of man-hours spent in common labor that are paid for at skilled work rates.

With an overhead handling system planned by American MonoRail engineers, man-power is released from handling labor.

Mechanized methods for lifting and carrying reduce fatigue so that operators can apply full time and skill to production—

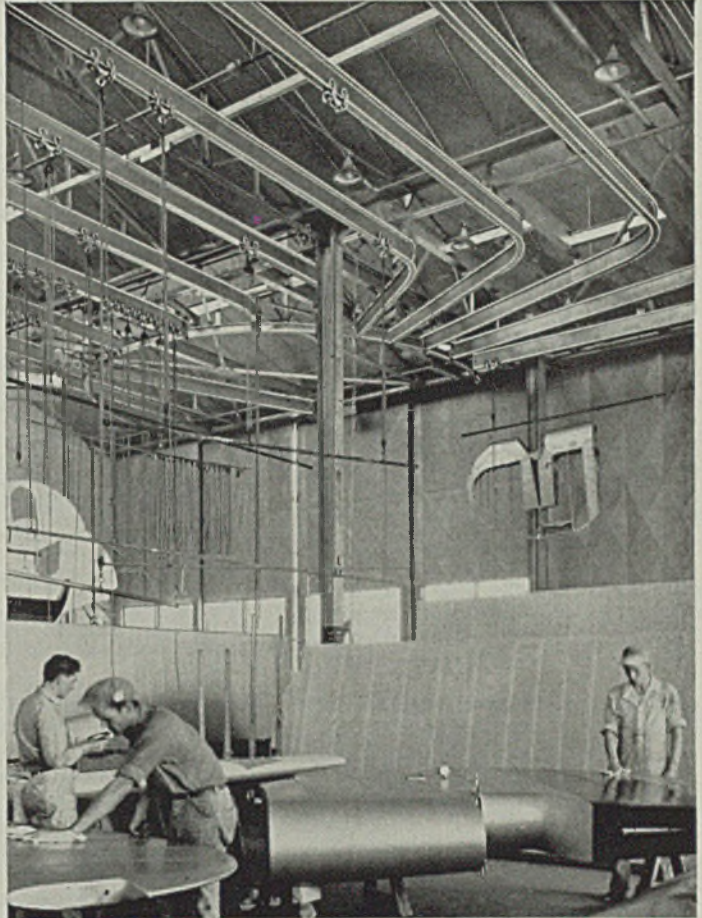
Loads are proportioned equally with process capacity—

Rehandling from unit carriers often is eliminated—

Materials and products kept on scheduled routes free from congestion or damage in transit.

Maximum return from skilled wages is therefore obtained only with a carefully planned handling system. Many such installations of American MonoRail show immediate savings large enough to pay their cost within a short time. Write for a copy of 254 page book illustrating hundreds of applications.

Engineering service with unbiased recommendation is available without obligation.



THE AMERICAN MONORAIL COMPANY

13102 Athens Ave. Cleveland, Ohio

is administrator of the rural electrification administration.

Lewis M. Lind, chief of the machinery division, department of commerce, has been loaned to the war department for an indefinite period. William H. Myer, assistant chief, will be in charge during the former's absence. Mr. Lind will be in the office of Lieut. Col. R. L. Maxwell, who is in charge of export restrictions.

NOBLE RESIGNS POST AS COMMERCE UNDERSECRETARY

Edward J. Noble, Republican undersecretary of the commerce department, tendered his resignation to the President last week.

In his resignation Mr. Noble stated that "in these days of concern for national defense I feel that there is comparatively little which I can add to what I have managed to accomplish in these directions. On the other hand, I feel that I can be really helpful in the field of national defense if I can free myself from the details of administrative office . . ."

In accepting the resignation the President said: "Your service with the government . . . has been one of usefulness and I want you to know how much I appreciate what you have done. . . ."

"I am grateful to you for your offer to help in the field of national defense. I welcome your voluntary enlistment in this field of work. The task is immediate. . . ."

GERMAN RAILWAY EQUIPMENT EXHIBITED AT SANTIAGO

Considerable public interest is being manifested in the German railway equipment currently on exhibit at the terminal station of the state railways in Santiago, Chile, according to a report from the American Commercial Attache, Santiago.

The equipment, consisting of six 3-car diesel electric articulated trains arrived in Chile early in May, having been shipped via Genoa on a Norwegian steamer. The shipment was permitted to proceed only after urgent representations had been made to the Allies by the Chilean government. Equipment now being shown is part of an original order placed by the state railways in December, 1937, for sixteen 3-car articulated trains, 3 electric locomotives and other electric equipment at a total cost of \$3,273,397.

It is anticipated several months will elapse before the articulated trains, which are to be used on the Santiago-Puerto Montt route and between Valparaiso and Calera, can be put in operation.

■ Mechanical stokers manufactured in June totaled 9986 units compared with 8415 in May, according to the bureau of the census.

War Department Awards

(Continued from Page 28)

dence, R. I., machines, \$96,201.50.
Cleveland Twist Drill Co., Cleveland, tools, \$1273.85.
Ex-Cell-O Corp., Detroit, machines, \$12,217.
Bakewell Mfg. Co., Los Angeles, machines, \$1557.

Navy Department Awards

United States navy department, bureau of supplies and accounts, last week announced award of the following contracts:

Worthington Pump & Machinery Co., Harrison, N. J., deaerating tanks, \$18,654.
The Upson-Walton Co., Cleveland, wire steel rope, \$17,750.10.
Batteryless Telephone Equipment Co. Inc., Pittsburgh, diving telephones, \$23,300.
Sheffield Steel Corp., Kansas City, Mo., rivet steel, \$41,959.95.
Carpenter Steel Co., Reading, Pa., steel, \$12,306.87.
Reynolds Metals Co., Richmond, Va., aluminum pigment, \$15,790.
Wire Rope Corp. of America Inc., New Haven, Conn., wire steel rope, \$9651.60.
Watson-Stillman Co., Roselle, N. J., hydraulic power equipment, \$52,832.40.
Sperry Gyroscope Co. Inc., Brooklyn, N. Y., gyro compass equipment, \$230,770.
General Motors Corp., Chevrolet division, Detroit, trucks, \$23,195.48.
United States Bronze Powder Works Inc., New York, aluminum pigment, \$47,398.
Seovill Mfg. Co., Waterbury, Conn., welding rods, \$13,258.75.
Central Iron & Steel Co., Harrisburg, Pa., steel plates, \$5335.74.
Phoenix Iron Co., Phoenixville, Pa., steel shapes, \$5182.70.
Okonite Co., Passaic, N. J., electric cable, \$11,898.05.
American Steel & Wire Co. of New Jersey, Washington, electric cable, \$17,465.
Benjamin Goldman, New York, door closers, \$7062.35.
Aluminum Co. of America, Washington, aluminum alloy, \$60,500.
Revere Copper & Brass Inc., Baltimore, brass and copper, \$18,761.30.
American Brass Co., Waterbury, Conn., brass, bronze, copper, \$221,611.73.
Doherty Bros., San Francisco, trucks, \$5365.81.
Onelda Ltd., Onelda, N. Y., silver-plated ware, \$13,643.75.
International Silver Co., New York, silver-plated ware, \$46,756.50.
Gorham Co., Providence, R. I., silver-plated ware, \$38,053.25.
R. Wallace & Sons Mfg. Co., Wallingford, Conn., silver-plated ware, \$16,751.25.
Reed & Barton, New York, silver-plated ware, \$52,987.50.
Caswell, Strauss & Co. Inc., New York, plg tin, \$258.150.
Benjamin Goldman, New York, hinges, \$6984.08.
E. F. Hodgson Co., Boston, prefabricated portable buildings, \$5172.
Aero Spark Plug Co. Inc., New York, spark plugs, \$7500.
Joseph T. Ryerson & Son Inc., Chicago, steel angles, \$15,105.15.
American Brass Co., Waterbury, Conn., manganese bronze, \$32,157.75.
Collyer Insulated Wire Co., Pawtucket, R. I., electric cable, \$281,857.45.
Wheeling Corrugating Co., Wheeling, W. Va., steel buckets, \$22,616.01.
Reeves Steel & Mfg. Co., Dover, O., steel buckets, \$12,649.88.
Walworth Co., New York, valves, cocks, \$21,116.20.
Westinghouse Electric & Mfg. Co., Washington, arc-welding sets, \$44,261.
Dorsey C. Anderson, Philadelphia, arc-welding sets, \$5750.

Gisholt Machine Co., Madison, Wis., turret lathes, \$7196.45.
Warner & Swasey Co., Cleveland, turret lathes, \$45,945.
Reed-Prentice Corp., Worcester, Mass., lathes, \$15,220.
Henry Prentiss & Co. Inc., New York, turret lathes, \$35,133.
Atlas Tack Corp., Fairhaven, Mass., copper nails, \$5341.
Crown Can Co., Philadelphia, tin cans, \$20,628.35.
Lindberg Engineering Co., Chicago, electric furnace, \$10,980.
Sherwin Williams Co., Washington, paint cans, \$15,034.99.
National Can Corp., New York, paint cans, \$8134.31.
Brown & Sharpe Mfg. Co., Providence, R. I., milling machine, \$5752.
American Sterilizer Co., Erie, Pa., sterilizers, \$6457.50.
William Sellers & Co. Inc., Philadelphia, traverse radial drilling machine, \$35,805.
G. A. Gray Co., Cincinnati, openside planer, \$27,258.
Bridgeport Brass Co., Bridgeport, Conn., seamless brass pipe, \$16,512.50.
Moore Machinery Co., San Francisco, machine, boring, drilling and milling, \$19,113.
Silent Holst Winch & Crane Co., Brooklyn, N. Y., cranes, tractor, \$16,710.
Corbin Cabinet Lock Co., American Hardware Corp. Succ., New Britain, Conn., locks, \$38,578.31.
Eagle Lock Co., Terryville, Conn., locks, \$5029.44.
Utica Cutlery Co., Utica, N. Y., jackknives, \$12,131.70.
Yale & Towne Mfg. Co., Stamford, Conn., locks, \$24,901.39.
Hooven, Owens, Rentschler Co., Hamilton, O., cylinder head parts, \$5913.
Westinghouse Electric & Mfg. Co., Washington, impulse blades, \$12,036.57.
Marine Torch Co., Baltimore, life buoy lights, \$8625.
Mueller Brass Co., Port Huron, Mich., naval brass, \$156,423.84.
Harrisburg Steel Corp., Harrisburg, Pa., cylinders, gas, shatter-proof, \$36,116.06.
Roberts Numbering Machine Co., Brooklyn, N. Y., numbering machines, \$5225.
C. Howard Hunt Pen Co., Camden, N. J., pencil sharpeners, \$8196.50.
Walter Kidde & Co. Inc., New York, water-closets, \$19,305.15.
Vollrath Co., Sheboygan, Wis., ladies' spoons, \$7414.90.
Wm. Scrimgeour, Washington, can openers, \$7600.
Carnegie-Illinois Steel Corp., Washington, steel shapes and angles, \$11,894.73.
Bryant Machinery & Engineering Co., Chicago, drilling machines, \$6093.
Gould & Eberhart, Newark, N. J., gear cutting machines, \$21,593.
Lidgerwood Mfg. Co., Elizabeth, N. J., steering gear, electric hydraulic type, \$41,238.
Carrier Corp., New York, refrigerating units, \$31,277.76.
Collyer Insulated Wire Co., Pawtucket, R. I., electric cable, \$5393.50.

\$5,689,725 BALDWIN TANK AWARD "CLEARED"

National defense advisory commission has "cleared" a contract of \$5,689,725 for the construction of large tanks to the Baldwin Locomotive Works, Philadelphia.

It is understood the tanks will weigh 70 tons and will carry 75 millimeter guns.

According to unofficial reports the British government will buy some \$200,000,000 worth of 25 and 30-ton tanks in the United States. This order is being arranged, it is said, through the commission.

Purchase Steel for New Giant Cyclotron

■ Steel will play an important part in construction and operation of California university's giant cyclotron. The university's board of regents last week approved a \$244,308 contract with Columbia Steel Co., Provo, Utah, for steel sheets to be made into a huge magnet.

Developed by Ernest I. Lawrence, the 4900-ton apparatus was made possible through a \$1,500,000 grant by the Rockefeller foundation, plus an additional \$250,000 from the University of California. A number of smaller cyclotrons have been built. They are capable of changing the nuclear structure of atoms, transmuted certain elements into entirely different elements and making certain substances radioactive.

Contract for copper, \$94,000, was also signed last week with Phelps Dodge Products Corp., New York.

Hitler Honors Krupp, "First Pioneer of Labor"

■ Gustav Krupp von Bohlen und Halbach, director of the Friedrich Krupp Aktiengesellschaft, foremost armament plant in Germany, was honored on the occasion of his seventieth birthday, Aug. 7, by Adolph Hitler and other Nazi leaders. At Krupp's villa in Essen Hitler presented him a golden National Socialist party emblem.

Dr. Fritz Todt, Westwall builder, gave him the war service medal, first class. Walther Funk, economics minister, awarded him the Shield of the Eagle and Rudolph Hess, Hitler's deputy leader, presented a bust of Hitler. Messages of congratulation were received from many Nazi leaders. Following the suggestion of Dr. Robert Ley, head of the labor front, Hitler named Herr Krupp "First Pioneer of Labor."

Before assuming charge of the Krupp works Herr Krupp was in the German foreign service and was a secretary of the German embassy in Washington in 1899 and 1900. He was made head of the Krupp interests in 1906.

New Production Index Includes More Industries

■ Production figures for a number of young and growing industries have been included in a new index compiled by the Federal Reserve board. The index includes more than 20 industries not represented in the former index, in use since 1927.

Average production for 1935-39 is assumed, in the new index, to be "normal"; formerly 1923-25 average

was the norm. The new index shows 1937 production averaged 3 per cent higher than in 1929, whereas the former index for 1937 showed an average 8 per cent below that of 1929.

Another change is the weighting of production figures for individual industries, the new series' broader base necessitating reweighting items such as locomotives, shipbuilding, copper smelting, silk, meat packing, pulp and paper and others.

Among industries now included in the index are industrial machinery, aircraft, chemicals, brick, glass, containers, rayon textiles and furniture.

A bulletin explaining the new index in detail may be obtained by writing to the Federal Reserve board, Washington.

Domestic Manganese Ore Output Up Slightly

■ Production of domestic manganese ore, 35 per cent or more manganese, in June amounted to 2600 gross tons; shipments, 2300 tons. Producers' stocks at the close of the month totaled 2500 tons. These figures are based on reports to the bureau of mines from producers who accounted for 90 per cent of output in 1939. May production was 2300 tons; shipments, 2000 tons; month-end stocks, 2200 tons. Shipments averaged 2442 tons monthly in 1939; total for the year, 29,307 tons.

Shipments in June were reported from Alabama, Arkansas, Georgia, Montana, Tennessee, Utah and Virginia.

June imports for consumption totaled 101,046 tons, with manganese content of 48,960 tons. General imports in June were 62,908 tons, manganese content 28,814 tons. In May imports for consumption were 127,517 tons containing 62,089 tons of manganese; general imports, 112,915 tons, containing 54,830 tons of manganese. There were no entries or withdrawals of foreign ferruginous manganese ore in June.

Chicago Engineering Firm Moves to Pittsburgh

■ H. A. Brassert & Co., consulting engineers for the steel, fuel and heavy metallurgical industries, have moved their engineering offices from Chicago to First National Bank building, Pittsburgh. This, it was stated, was prompted by increasing concentration of steel company headquarters in that city.

The company's executive offices are in the Lincoln building, 60 East Forty-second street, New York, from which office foreign business will be handled. It also has offices in London, Paris, Lima and Buenos

Aires, and will retain an office in Chicago.

The firm, of which Herman A. Brassert is president, has served practically every iron and steel company in this country and many abroad. It has done business in Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Denmark, Egypt, England, France, Germany, Holland, India, Italy, Japan, Manchuria, Mexico, New Zealand, Norway, Peru, Poland, Scotland, Spain, Switzerland, Turkey, U.S.S.R., Yugoslavia, and others.

Recently the firm constructed three large iron and steel plants in Great Britain, the most prominent being the steelworks at Corby, about 80 miles from London. This plant consumes high-sulphur native ores, which formerly were considered unsuitable for the production of steel but now are being processed, using a new method developed by the Brassert company. The development now is of great value to England because it makes the plants independent of foreign iron ores.

Plants also were built in Germany and Austria employing similar methods. These plants, however, were not completed, on account of the outbreak of the war, at which time Mr. Brassert dissociated himself from the project.

Aluminum Ore Treating Plant To Expand 50%

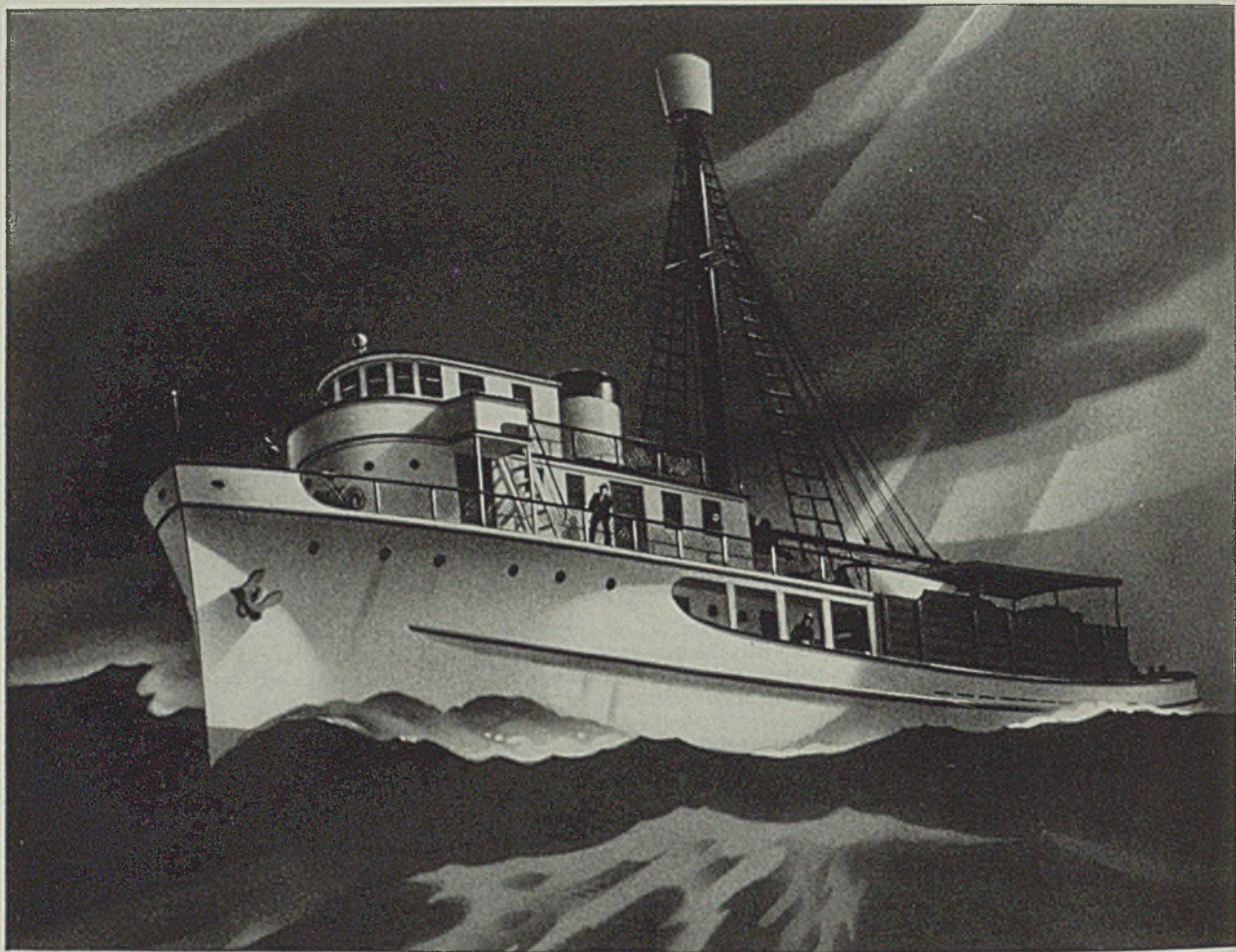
■ An increase of 50 per cent in alumina production capacity has been authorized for the Mobile, Ala., works of Aluminum Ore Co., subsidiary of Aluminum Co. of America.

Outstanding construction necessary includes: 16 precipitator tanks, one calcining kiln, and an addition to the bauxite storage building. This work, part of the Aluminum company's current \$30,000,000 expansion program, will be completed about Jan. 1.

A second eight-hour shift has been added by the Aluminum Co. of America's magnesium division at Buffalo. The plant resumed operations early in July after being idle eight years, now employs 300 men and expects to double this figure within 60 days.

The plant is making magnesium castings for the aircraft industry.

■ Charles R. Hook, president, American Rolling Mill Co., Middletown, O., and chairman of the executive committee, National Association of Manufacturers, New York, will speak on the role played by industry in national defense in a 15-minute radio interview over the Columbia Broadcasting system, Aug. 29, 10:15 p. m., eastern daylight saving time.



4140 GOES TO SEA

It is well for all concerned that builders of marine Diesels make performance capacity the primary basis for the selection of materials. Breakdowns at sea or anywhere else are no fun for anyone, including the engine builder.

But the demand for reliability can be met and production costs still kept where they should be. One prominent builder, for example, is doing both by specifying Chromium-Molybdenum (SAE 4140) steel for a number of parts including bolts, wrist-pins, cylinder head studs, gears, tappets and crankshafts.

The fact that this steel can be treated to develop the properties necessary for applications having such different requirements is of value to both builder and user. It simplifies heat treatment and stockroom procedures. And, since simplification makes for uniform quality in the finished parts, it gives added assurance of dependability.

Your own product might benefit through the use of this versatile steel. You will find complete data on this and other molybdenum steels in our book "Molybdenum in Steel," which will be sent free on request.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

Climax Mo-lyb-den-um Company
500 Fifth Avenue • New York City

MOLY

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

Officials Fear 1940 Season Was Oversold.

Curtice Expects 10 Per Cent Increase in 1941.

Nash To Introduce Low-Priced Six-Cylinder Model.

1941 Dodge, De Soto Said To Have Fluid Transmission.

Ford Reported Contemplating Making Armor Plate.

DETROIT

■ ONE of the most ticklish questions now confronting sales and administrative officials of the motor companies is whether new car sales can hold to or possibly pass the strong rate prevailing this year. True, they are offering optimistic predictions and they are spending the usual millions of dollars on new plant equipment, but at the same time some of them are wondering whether the future is as bright as it seems.

They must recognize that the late 1940 season was considerably oversold, because of fear on the part of buyers that prices on 1941 models would be increased and also the entirely unjustified fear that the national defense program would interfere with production of motor cars. Thousands of persons bought 1940 models ahead of schedule, you might say. Thousands are now paying for cars, who under normal conditions might not have come into the market until late this year or early next.

Some new groups of buyers must come in and take the place of these "premature" customers. The hope is that expanding industrial production with its attendant defense program will create new buyers, will replenish the pocketbooks of workmen who have been finding slim pickings in recent years, will thus attract them to automobile showrooms.

In the shadowy background, of course, is the bogie of a sudden stoppage of hostilities abroad and the sharp psychological deflationary effect of such a turn of events all

over the world. To offset this unfavorable factor, however, is the certain continuation and expansion of arming this country for eventualities regardless of what happens abroad.

"The general expectation in the automobile industry now," says H. H. Curtice, Buick general manager and a director and vice president of General Motors, "is for a 10 per cent expansion next year in the total passenger car market. I think that expectation will be realized and we can look forward to a 1941 model year of 3,500,000 cars." Of these Buick hopes to capture 300,000 in its march toward 10 per cent of the industry's total. Already Buick has committed for materials and supplies to the extent of \$100,000,000 to meet requirements for the remainder of the year. August production schedules call for 16,000 assemblies and over the remainder of the year 130,000 will be completed, or about 20,000 in excess of the same period last year.

"Compound Carburetion"

The Buick showing last Tuesday followed the pattern of these events at Flint for the past three years, and the 350 newspaper and magazine representatives present were given opportunity to inspect all the 22 models in the 1941 series, as well as to drive some of them.

As hinted here before, the big story for Buick this year is "compound carburetion" or the use of

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two carburetors, one at either end of the manifold, giving exceptional acceleration, particularly at high speeds, and, in company with redesigned combustion chambers and an increase in compression ratio to 7 to 1, an increase in gasoline economy of around 12 per cent. Horsepower, likewise, is increased—to 125 in the smaller engines and to 165 in the larger.

Entirely new body styles have been developed for the series 40 or Special cars, featuring "fast back," also concealed running boards, the latter being narrow and hidden by a skirt on the door panel. The Torpedo bodies introduced last year on the 50 and 70 series have been continued with minor changes. The series 90 or Limited models also are completely restyled and are claimed to represent the first thoroughly modernized, popularly streamlined and fully appointed cars available in the high-price field in more than five years. Reports that a 20 model will be introduced for the low-price field have proved incorrect.

Among other innovations in the Buick line is the new type of single-piece hood which may be raised from either side or removed entirely for work on the engine compartment. Until this year Buick has steered clear of the "alligator" type hoods common on most other cars, raising either from the front or rear, in favor of the conventional two-piece hood hinged at the center. The new design is a clever combination of both ideas.

■ PONTIAC field organization will meet here Aug. 22-24 to inspect new models, 10,000 of which will be completed this month. No formal showing for the press will be scheduled this year, and there is comment that this policy may be a forerunner of a general discontinuance of press previews throughout the industry. Difficulties in scheduling, high cost for measurable value and other headaches are convincing some sales officials that press previews are nuisances that could well be dis-

pensed with—an opinion which even some of the guests at these affairs share.

Pontiac will assemble 22,000 cars in September and is aiming at a 30 per cent increase in production of 1941 models, a somewhat more ambitious goal than that of Buick but one which may prove considerably more difficult of attainment. All models in the 1941 line will be known as Torpedoes instead of just the large eight. Six and eight-cylinder engines will be interchangeable on the same chassis. By the way, speaking of torpedoes, Buick calls its new engine the Fireball 8. All that remains now is for someone to introduce a Screwball 6.

Finally giving official confirmation to reports published from time to time in these columns over the past three years, Nash has announced the imminent introduction of a new low-price 6-cylinder model to be known as the Ambassador 600, with a new engine reputed to give economy of 25-30 miles per gallon. Some seven million dollars have been spent in refurbishing assembly facilities at the company's Kenosha, Wis., and Milwaukee plants in preparation for production of the new competitor of Ford, Chevrolet, Plymouth and Studebaker Champion.

Three Lines for Nash

Nash thus will have three lines of cars this fall, and several models in each line, bodies on all three lines being practically identical. The new 6-cylinder motor is simplified in design and is claimed to have quick "getaway" power and unusual acceleration plus exceptional economy. Nash is said to be hoping to boost its 1941 model production to 100,000, with the help of the new entry in the low-price field. Preview of new models will be held Aug. 22, official public announcement coming early in October.

This is the season for "teaser" and "mystery" announcements from automobile headquarters. A photograph will be released showing one wheel of a 1941 model, or a publicity announcement will be distributed cautioning editors to "watch for stupendous news from Blanks." They all serve to drum up interest and further whet curiosity about models already on the assembly line. Dealers paint the windows of their showrooms and hundreds try to pry open a door to see what may be inside. Trucks with cars carefully shrouded in canvas slink across the highways at night from assembly plants. It's all a part of a good merchandising program, no doubt.

For example, now at hand is the "under-cover news that the 1941 Dodge is scheduled to present a constructional innovation so revolutionary in character that it will simplify car driving to a sensational

degree." The office of Forest H. Akers, sales manager, supplies word that "while this as yet unrevealed basic innovation is certain to be hailed as an epochmaking mechanical advancement, it will be but one of the many details found for the first time on Dodge for 1941."

It must be acknowledged, naturally, that this sensational news is primarily for newspaper readers and those located far away from the motor capital. No great secret around Detroit is the news that Dodge and De Soto will offer the Chrysler fluid drive transmission on 1941 models. In fact, ever since the construction and equipping of the

Car builders seem to be growing increasingly conscious of the injurious effects of dirt in engines on performance and operating life. Steps have been taken to make doubly sure air drawn into fuel lines is filtered and scrubbed clean of dust and dirt. Lately the oil-bath air cleaner has been perfected which both washes air in a bath of oil and passes it through a copper mesh filter. This equipment, at first designed for cars to be operated in dusty climates, has found widening acceptance and will be standard on Buick engines for 1941. Others may follow suit as the war on dirt quickens.

Detroit was speculating last week on the possible location of two new plants to produce tanks for the army, supposedly to be built here shortly and operated by General Motors and Chrysler. Estimates from Washington indicated the plants would cost somewhere near \$25,000,000 and it is understood a scramble is developing among shrewd real estate operators to unload some industrial property on the government at choice prices. Reports are heard that the sudden boom in industrial real estate may persuade army officials to acquire some idle plants in this area and equip them rather than to build new ones.

Both GM and Chrysler are making detailed studies of requirements involved in tank manufacture, and Ford is said to be contemplating production of armor plate for tanks in his steel mill here.

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	362,560
6 mos.	1,305,501	2,055,744	2,539,440
July	150,450	218,494	.....
Aug.	96,946	103,343	.....
Sept.	89,623	192,678	.....
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†
July 20	53,020	47,420
July 27	34,822	40,595
Aug. 3	17,373	28,250
Aug. 10	*11,635	*26,125
Aug. 17	20,475	15,105

†Comparable week. *Revised.

new Chrysler transmission plant was announced several months ago, it appeared certain the fluid drive would be extended to other models.

As anyone who has driven a car equipped with the fluid drive can tell you, this is an important ace-in-the-hole for Chrysler, and the corporation's avowed determination to better its share of the industry's total sales in 1941 means this ace is going to be played. It should be effective in bringing back Dodge and De Soto into better competitive position with Buick, Pontiac and Olds. The latter have been drawing away from their Chrysler competitors over the past year, largely because of the great popularity of 1940 model body styling. If Chrysler can close the gap with its fluid drive, it will have been well repaid for the investment in the new transmission plant, and the presses and machine tools required.

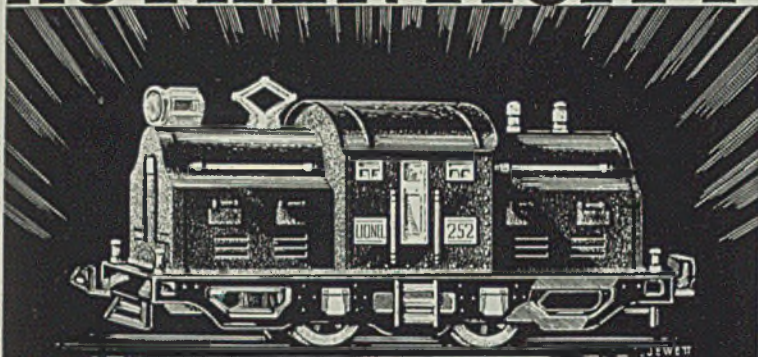
Basic Dolomite Completes \$400,000 Plant Expansion

■ Basic Dolomite Inc., Cleveland will complete this week a \$400,000 expansion program at its Narlo, O., plant. A \$275,000 addition to the main burning plant houses two new 100-ton rotary kilns with processing and loading equipment, which will be used to make the company's dead burned grain magnesite clinker and other magnesitic refractories. Old kilns will be used to make larger tonnages of dolomitic hearth refractory.

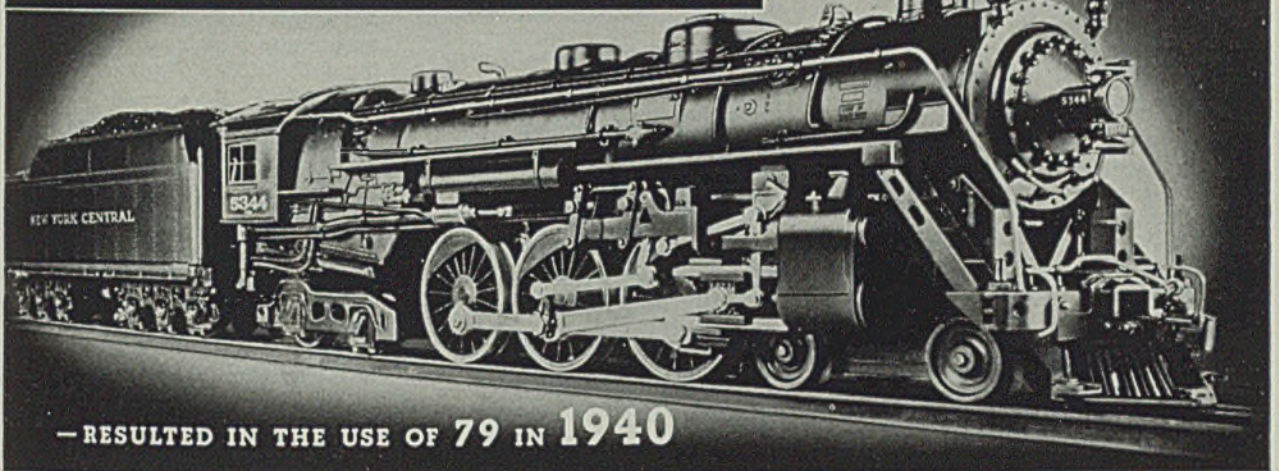
The company recently constructed a \$125,000 plant, also at Narlo, O., for the manufacture of its newly developed line of plastic, cementing and ramming basic refractories. Chief feature of this plant is that all manufacturing operations are under completely automatic control. Merely pressing a button on a giant switchboard will initiate a series of automatic processes such as selecting, weighing, conveying, mixing constituents and bagging, to produce a product of any desired composition.

AUTHENTICITY

—DIE CASTINGS
PROVIDE REALISM
IN MINIATURES



5 DIE CASTINGS ON THE JOB SINCE 1929



—RESULTED IN THE USE OF 79 IN 1940

Miniature trains are built for youngsters—and American youngsters are tough customers. Their scaled-to-size toys must not only resist abuse, but they must be authentic reproductions of the parent models. This demand for realism is one of the many reasons for the constantly increasing use of ZINC Alloy Die Castings in the toy industry.

When 5 ZINC Alloy Die Castings were utilized in the construction of a toy locomotive produced in 1929, it was in the nature of an experiment. But the 79 die castings in the 1940 Hudson type locomotive and tender—produced by the same manufacturer—are far from an experiment. This selection of material is based on 11 years of experience, during which ZINC Alloy Die Castings offered the maximum in detail and strength—at a minimum production cost.

Do these qualities suggest possible improvements in your products through the use of ZINC Alloy Die Castings? If you are not thoroughly informed on the physical and economic advantages offered with this metal and production method, we suggest that you consult a commercial die caster—or write to The New Jersey Zinc Company, 160 Front Street, New York City.

This advertisement is the eighth of a series. Copies of those preceding gladly mailed on request.



ZINC
ALLOY DIE
CASTINGS

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

MEN of INDUSTRY

■ C. H. MANION, chief engineer since 1932; Follansbee Steel Corp., Pittsburgh, has been elected vice president in charge of operations, and William L. Barr has been advanced from maintenance engineer to succeed Mr. Manion as chief engineer.

Mr. Manion has been with the corporation and its predecessor, Follansbee Bros. Co., since 1919, serving successively as designer, maintenance engineer, efficiency engineer and operating engineer. As chief engineer he was active in planning the company's present modernization program.

Mr. Barr has been with Follansbee since 1927, starting as a tracer and advancing through positions of detailer, designer, checker, chief draftsman and maintenance engineer.

C. F. Niemann Jr. has been appointed assistant to the president, Parkersburg Iron & Steel Co., Parkersburg, W. Va.

G. S. McKee, production manager, Talon Inc., Meadville, Pa., has been elected a director, Hall Planetary Co., Philadelphia, milling machine manufacturer.

Fred A. Prahl, formerly with Continental Can Co. and Owens-Illinois Can Co., is now associated with Weirton Steel Co., Weirton, W. Va., as manager of research.

Samuel M. Felton has been appointed eastern sales manager, railroad division, Edward G. Budd Mfg. Co., Philadelphia. He has been with the Budd organization since 1935.

Ralph J. Stayman, associated for many years with the steel warehouse trade, formerly manager of warehouses for Jones & Laughlin Steel Corp. and Joseph T. Ryerson & Sons Inc., has been appointed manager of warehouse sales for Carnegie-Illinois Steel Corp., Pittsburgh.

Col. Fred Glover has resigned as president and director, Reo Motors Inc., Detroit, recently reorganized. W. C. Wood has been elected vice president and also will continue to serve as treasurer.

F. J. Geiger has been named assistant manager, electrical department, Allis-Chalmers Mfg. Co., in charge of sales and engineering at the Norwood, O., plant, filling the vacancy created by the recent re-



C. H. Manion



William L. Barr



Ralph J. Stayman

tirement of C. J. Rattermann. Frank R. Freyler, of the Philadelphia office of Allis-Chalmers, has been transferred to Norwood to take over Mr. Geiger's former duties as assistant manager of sales. E. C.

George and A. Thorsen have been appointed works manager and assistant works manager, respectively, Norwood works.

Roderick M. Ladd has joined the sales staff of Hooker Electrochemical Co., Niagara Falls, N. Y. He will be engaged in promoting the sale of the general line of Hooker chemicals in the metropolitan New York area.

Frank S. Austin has been named purchasing agent of New York Central Railroad Co., Indiana Harbor Belt Railroad Co., and Chicago River & Indiana Railroad Co., with headquarters in New York. He succeeds the late C. C. Warne.

Herman J. Hofmann, since April, 1926, assistant open-hearth superintendent, Lukens Steel Co., Coatesville, Pa., has been promoted to open-hearth superintendent, succeeding J. D. Walters, resigned.

W. S. Jones, associated with the Detroit Vapor Stove division, Borg-Warner Corp., 23 years, and for many years in charge of range sales in the Detroit area, has been appointed sales manager of that division.

William T. Barton, associated with the purchasing department of American Bosch Corp., Springfield, Mass., 18 years, has been promoted from assistant purchasing agent to purchasing agent. He succeeds Joseph F. Drennan, newly appointed purchasing agent for the city of Springfield, Mass.

J. D. A. Morrow has resigned as president, Pittsburgh Coal Co., Pittsburgh, to become president of Joy Mfg. Co., Franklin, Pa., maker of loading machinery, conveyors, and cutters. He will continue to serve as a director and a member of the executive committee of Pittsburgh Coal.

Leo J. Messinger has established his own business, dealing in metals and other salvage materials, with offices at 1132 West Thirty-fifth street, Chicago. Mr. Messinger has been associated with the nonferrous metal business in the Chicago district 25 years.

Merton J. Turck has been appointed sales manager, Renown Stove Co., Owosso, Mich. Mr. Turck was formerly with Andes Range &

Furnace Corp., Geneva, N. Y., where for the past year and a half he had charge of sales in western New York and western Pennsylvania, with headquarters in Buffalo.

George Satterthwaite, since 1935 executive secretary, Cold Finished Steel Bar institute, New York, has resigned to become associated with The Midvale Co., Philadelphia, with which company he was previously associated many years.

J. Edward Trainer, general production manager of all Firestone Tire & Rubber Co. plants, Akron, O., has been elected vice president. He will continue his duties as general production manager. He has been with Firestone since January, 1939.

Anthony W. Deller has been named patent counsel for Interna-



Frank J. Rief

Who has been placed in charge of all purchases for Carnegie-Illinois Steel Corp., Chicago, as noted in STEEL, AUG. 12, p. 30

tional Nickel Co. Inc., New York, and will head the company's newly organized patent department. Mr. Deller has been chief consultant on patent affairs for International Nickel the past ten years. His offices will continue at 67 Wall street.

Floyd Stroup is now superintendent of the melt department, Copperweld Steel Co., Warren, O. Mr. Stroup was previously associated with American Steel Foundries, Central Alloy Steel Co., Republic Steel Corp., Republic Research Co., Timken Roller Bearing Co., United Engineering & Foundry Co., and Aetna Standard Engineering Co.

The Cleveland district committee of American Society for Testing Materials at a recent election chose officers for the ensuing period as follows: Chairman, Arthur J. Tus-



George Satterthwaite

cany, Tuscany-Turner and Associates, Cleveland; vice chairman, Arthur W. Carpenter, B. F. Goodrich Co., Akron, O.; secretary, W. W. Rose, Gray Iron Founders' society, Cleveland.

C. C. Kordenbrock has become associated with Kordenbrock Machine Co., Detroit, as sales engineer. He formerly was with Lodge & Shipley Machine Tool Co., Cincinnati.

E. Q. Smith has been elected vice president and controller, Bundy Tubing Co., Detroit, while Dr. R. H. Hobrock has been elected vice president in charge of production and research.

M. B. Sackheim, vice president and general manager, Brown Fence & Wire Co., Cleveland, has been elected president. He succeeds Charles R. Underhill, resigned. R. W. Taylor has been named vice president and a director.

Harold J. Dawe, a graduate of the University of Michigan, 1940, has



Craig Hampton

Whose appointment as superintendent of maintenance at Copperweld Steel Co.'s plant in Warren, O., was reported in STEEL, Aug. 12, p. 30

joined the research staff of Acheson Colloids Corp., Port Huron, Mich. He will devote his time to investigative work on colloids.

Offers Patents Free For Government Use

Nirosta Corp., New York, last week announced that until further notice it will require no license fee for use of stainless steels on which it holds patents insofar as the material enters into products for the United States government. According to Emil Schill, president, the action was taken as his company's share in meeting the present emergency.

Included is patent No. 2,200,229 issued to the company May 7, 1940, covering non-heat treated welded construction composed of an austenitic steel containing about 18-25 per cent chromium, about 7-12 per cent nickel and less than 0.07 per cent carbon. This alloy is known as "low carbon alloy."

Also included is patent No. 2,186,710 issued Jan. 9, 1940, involving four claims. Claims 3 and 4 cover an alloy containing titanium. Leading steel companies are licensed to produce and sell this alloy and purchasers are automatically permitted to use it in manufacturing welded alloys. Claims 1 and 2 cover articles of welded construction made of a stable austenitic alloy composed of approximately 18-25 per cent chromium, approximately 7-12 per cent nickel, a small amount of carbon and an additional alloy constituent "having the property possessed by titanium of forming a stable chemical compound with the carbon."

Nirosta now is preparing to grant licenses for making welded articles of the low carbon alloy on the basis of 0.3 cents per pound of such alloy entering into the finished article and of the columbian alloy on the basis of 0.75 cents per pound.

Suggests New York Build Subway Air-Raid Shelters

Recommendations have been made to board of transportation, New York, by Civil Service Technical guild for immediate construction of air-raid shelters along routes of proposed rapid transit lines, later to be used as subway stations.

Such action would serve the double purpose of furthering the national defense program and providing continued employment for subway engineers who now are facing a work shortage, according to Philip F. Brueck, guild president. He also suggested the federal government subsidize the project. The board has referred the plan to its chief engineer.

Activities of Steel Users, Makers

■ HENRY DISSTON & Sons Co. Inc., Philadelphia, has virtually completed expansion of its plant for producing light armor plate for army tanks. Additional fabrication machinery has been added but no rolling mill equipment. Latter includes one 84-inch plate mill.

Perfect Circle Co., Hagerstown, Ind., for the year ended June 30 had no lost-time accidents at its Toronto, Ont., Tipton, and New Castle, Ind., plants. Company's fourth plant at Hagerstown reported only five minor injuries out of 1,307,020 man hours.

Federal Shipbuilding & Dry Dock Co., United States Steel Corp. subsidiary, launched the first of a series of five C-1 type cargo vessels for the maritime commission in Kearny, N. J., Aug. 3. It is the twelfth cargo vessel to be launched for the commission by this yard.

A transcontinental exhibition train has been arranged for members of the American Supply & Machinery Manufacturers' association for displaying products to mill supply distributors and their customers. The train will start from Boston Oct. 28 and cover 33 principal cities over a period of 46 days.

Geometric Tool Co, New Haven, Conn., has appointed Browning Tool & Supply Co., Indianapolis, exclusive representative for its products in the Indianapolis territory. This area and southern Ohio were formerly handled by George Langen Jr., Cincinnati, who will now cover southern Ohio and parts of Kentucky.

Formal organization of Mercury Aircraft Co. Inc., Menominee, Mich., has been completed. Officers are: J. B. Baumann, president; Frank L. Betts, vice president in charge of sales; R. D. Smith, vice president and general manager, and W. W. Rittamel, secretary-treasurer. Mr. Smith and Mr. Rittamel were executives of the former Mercury Aircraft Co. Inc., Knoxville, Tenn., which was dissolved when the Michigan corporation was formed.

Orders booked by York Ice Machinery Corp., York, Pa., during the nine months ended June 30 totaled \$12,560,931, against \$11,396,429 in the like period last year. Sales in the same period amounted to \$8,589,596, compared with \$7,876,752 last year.

An increase of 400 per cent in its shipments of cone-drive worm gear-

ing for the second quarter, as compared with the second quarter of 1939, is reported by cone-drive division, Michigan Tool Co., Detroit.

Montaup Electric Co., Fall River, Mass., is building a new type high pressure forced-circulation steam boiler as part of a \$3,000,000 expansion program at its Somerset, Mass. power station. The boiler will produce 650,000 pounds of steam an hour at a pressure of 2000 pounds per square inch and temperature of 960 degrees Fahr. Contract for construction has been awarded to Combustion Engineering Corp., New York.

National Acme Co., Cleveland, recently changed from steam to electric heat in its hardening, pickling and drying processes and is

reported to have effected considerable saving by closing its steam boiler plant for the summer.

The boiler plant had been in operation for only four processes and was relatively expensive when not used for plant heating. Electric heat was found efficient for the processes and General Electric immersion and strip type heaters with a capacity totaling 57 kilowatts were installed. Total cost of change-over, including cost of equipment was reported small in comparison to cost of operating the steam plant during the summer.

■ Steel barrel and drum production in June was 1,097,836 units and shipments 1,101,901 units, compared with 930,319 units produced and 916,285 shipped in May. For six months production was 5,772,050 and shipments 5,787,784, according to the bureau of the census. In six months, 1939, production was 4,665,202 and shipments 4,657,283.

Consumers' First Half Net Profits

■ AGGREGATE first half net income reported by 165 iron and steel consumers totaled \$147,536,270, compared with \$78,565,037 earned by the same companies in the corresponding period last year. Only seven incurred a loss for the six months, while 33 reported deficits for first half, 1939. Prior tabulations in STEEL, July 22, p. 20; July 29, p. 14 and Aug. 12, p. 41 listed 124 companies; the following includes 41. All figures are net earnings except where asterisk denotes net loss:

	Second 1940 Quarter	Second 1939 Quarter	First 1940 Half	First 1939 Half
Aetna Ball Bearing Mfg. Co., Chicago	\$41,676‡	\$49,630‡	\$129,304	\$113,182
Aetna-Standard Engineering Co., Youngstown, O.			82,633	94,959*
Airway Electric Appliance Corp., Toledo, O.	28,567	7,499	38,161	7,760
Allied Products Corp., Detroit	180,948‡	60,741‡	218,748	47,970
Blaw-Knox Co., Pittsburgh			602,717	211,086
Boeing Airplane Co., Seattle			69,174*	183,550*
Borg-Warner Corp., Chicago	1,054,743	1,261,345	2,830,983	2,416,056
Bucyrus-Erie Co., Milwaukee			1,100,271	679,487
Burd Piston Ring Co., Rockford, Ill.			25,160	11,384*
Byers Co., A. M., Pittsburgh	59,820	173,372	125,127‡	296,370‡
Carrier Corp., Syracuse, N. Y.			278,698	147,642
Chapman Valve Mfg. Co., Indian Orchard, Mass.	160,240	86,102	316,731	109,648
City Auto Stamping Co., Toledo, O.	143,922	162,365	156,375	128,963
Diamond T Motor Car Co., Chicago	29,336	52,632	51,872	98,928
Electric Controller & Mfg. Co., Cleveland			276,101	11,270*
Food Machinery Corp., San Jose, Calif.	357,037	318,961	663,037‡	572,017‡
Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.	147,855‡	74,273‡	300,485	193,911
Holland Furnace Co., Holland, Mich.	381,625	291,588	262,384	132,944
Leland Electric Co., Dayton, O.			89,463	44,322
Liberty Aircraft Products Corp., Farmingdale, N. Y.	30,322‡	936‡	56,576	6,124
Maytag Co., Newton, Iowa	342,080	172,759	698,465	563,688
McCord Radiator & Mfg. Co., Detroit			80,799	31,631
Midland Steel Products Co., Cleveland	493,442	476,411	1,091,124	1,017,377
Motor Wheel Corp., Lansing, Mich.	568,858	279,861	1,183,066	700,266
National Supply Co., Pittsburgh	486,602	314,390*	912,830	547,370*
Ohio Seamless Tube Co., Shelby, O.			214,772	61,832
Outboard Marine & Mfg. Co., Waukegan, Ill.	749,350	727,791	915,913‡	919,333‡
Parkersburg Rig & Reel Co., Parkersburg, W. Va.	96,690‡		196,674	152,696
Pittsburgh Screw & Bolt Corp., Pittsburgh	122,172	41,350*	277,370	49,476*
Reed Roller Bit Co., Houston, Tex.	455,851‡	433,115‡	763,039‡	839,560‡
Rheem Mfg. Co., Richmond, Calif.	147,506	126,765	323,784	217,545
Ruud Mfg. Co., Pittsburgh			144,862‡	65,751‡
Savage Arms Corp., New York	202,789	118,061	226,206	74,193
Stewart-Warner Corp., Chicago	349,043	53,986	677,245	200,261
Sullivan Machinery Co., Michigan City, Ind.	87,286	25,894	112,720‡	217,545
Tatcher Mfg. Co., Elmira, N. Y.	158,936	215,312	265,859	399,231
United Aircraft Corp., East Hartford, Conn.	3,848,077	2,187,890	6,228,106	3,678,689
United Aircraft Products Inc., Dayton, O.	136,707‡		249,997	45,282
White Sewing Machine Corp., Cleveland	88,197	40,258	223,835‡	153,275‡
Willys-Overland Motors Inc., Toledo, O.	182,047*	391,829*	499,635*	740,197*‡
Yellow Truck & Coach Mfg. Co., Pontiac, Mich.	1,697,358	1,031,082	2,721,109	1,419,861

‡Indicated; *loss; †before federal income taxes; ‡exclusive of British subsidiary.

MEETINGS

EXTENSIVE PROGRAM FOR WELDING SOCIETY MEETING

■ FIFTY-NINE papers covering practically every phase of welding, cutting and treating processes will be presented at 15 technical sessions during the annual meeting of the American Welding Society at Hotel Cleveland, Cleveland, Oct. 21-25, during the National Metal Congress and Exposition.

Separate sessions will be conducted on machinery manufacture, resistance welding, pipe welding, and structural welding. Two sessions will be devoted to fundamental research, another to industrial research and a fourth to combined fundamental and industrial research. Metallurgical aspects and special applications of welding will be covered in two sessions, while other meetings will be devoted to the steel, shipbuilding and railroad industries.

Among processes to be covered are resistance welding, spot welding, arc welding, oxyacetylene welding, machine cutting, flame hardening, hard facing, flame cleaning and flame machining. Applications range from gear blanks to bridges and buildings, and include electrical machinery, steel mill equipment, tank cars, passenger cars, aircraft, and naval vessels. Training and qualification of welding operators will be discussed along with problems in design, layout, fabrication and testing. Other papers will describe latest procedures in welding carbon steels, alloy steels and nonferrous metals and alloys.

Awards of the society's Samuel Wylie Miller Memorial medal and Lincoln gold medal will be made at the opening session on Oct. 21. In addition, seven cash prizes offered by the Resistance Welder Manufacturers' association for the best papers on resistance welding will be awarded at this time. Annual banquet will be served on Oct. 24.

METAL IN ARCHITECTURE IS SYMPOSIUM SUBJECT

A symposium on "The Development of Metal as a Structural Element in Architecture" is to be held at the University of Pennsylvania, Philadelphia, Sept. 18, during a bi-centennial conference commemorating the 200th anniversary of the university's origin. Meeting will start at 3:40 p.m.

Speakers and subjects will include: Joseph Hudnut, dean of the faculty and professor of architecture, Harvard University, Cambridge, Mass., on "Development of Iron and Steel as Structural Elements in Architecture"; F. H. Frank-

land, chief engineer, American Institute of Steel Construction, New York, on "Engineering Aspects of Steel in Structures"; Frank Lloyd Wright, Taliesin school for study of architecture and allied arts, Spring Green, Wis., on "Aesthetic Aspects of Steel Construction"; and Dr. Harvey W. Corbett, practicing architect, New York, on "The Skyscraper and the Automobile Have Made the Modern City."

This symposium is one of a series of three in the general field of the fine arts. The first, on Sept. 16, will deal with "New Light from Old Lamps; "Archaeology and the Humanities"; second, on Sept. 17, with "Influence of the Social Organization on the Arts." Membership in the conference is without charge upon application and within the limit of accommodations. Applications should be made to the Registrar of the Bicentennial conference, Houston Hall, University of Pennsylvania.

DISTRIBUTION CONFERENCE TO STUDY WAR INFLUENCE

Twelfth Boston Conference on Distribution to be conducted at Hotel Statler, Boston, Oct. 7-8, has selected "War Emergencies and Distribution" and "The 1940 Census of Business" as two of its major themes. Purpose of the conference is, through exchange of ideas, to stimulate constructive thinking about the major problems of distribution.

Principal sponsor is the retail trade board of the Boston chamber of commerce, in co-operation with Harvard university graduate school of business administration, Boston university college of business administration, Massachusetts Institute of Technology, and many other schools and business organizations. Daniel Bloomfield, 80 Federal street, Boston, is director of the conference.

Died:

■ TYLER W. CARLISLE, 54, since May, 1937, president, Strong, Carlisle & Hammond Co., Cleveland, in that city, Aug. 14. Born in Cleveland, Mr. Carlisle attended schools there and Massachusetts Institute of Technology from which he graduated in 1909. After three years' apprenticeship with an eastern manufacturer he joined Strong, Carlisle & Hammond. His father, the late Robert H. Carlisle, was one of the organizers of the company in 1887. In 1916 he was made sales manager and a director, subsequently becoming general sales manager, vice president, and president. Mr. Carlisle was active in civic affairs. He had been a member of

the Community Fund council since 1937.

•
Oliver S. Sleeper, 65, in Buffalo, recently. Until ill health forced his retirement a year ago he was a mechanical engineer with Buffalo Foundry & Machine Co., Buffalo.

•
George McMurtrie Godley, 64, former vice president, Linde Air Products Co., New York, and at one time president, Burden Iron Works, Troy, N. Y., Aug. 10, at Martha's Vineyard, Mass.

•
Charles D. Hastings, Aug. 7 in Detroit. Before his retirement six years ago he was chairman of the board, Hupp Motor Car Corp. He joined Hupp in 1908 as general manager, later becoming president. At the time of his death he was a director, Murray Corp. of America.

•
William C. Mahon, 65, former president, Cleveland Steel Tie Co., in Cleveland, July 31. He retired five years ago.

•
Charles Frederic Drew, since 1919 secretary-treasurer, Rust Engineering Co., Pittsburgh, and subsidiaries, at his home in Pittsburgh, recently.

•
Robert George Gutmueller, 59, assistant production manager, Doehler Die Casting Co. plant at Pottstown, Pa., Aug. 7, in Queens Village, Queens, New York.

•
Frank A. Chapper Sr., 74, president, Frank A. Chapper Iron Works, Detroit, recently. He retired from active business 25 years ago but retained the presidency of the Chapper works.

•
A. Gunnar Myers, 53, superintendent, pattern shop, National Malleable & Steel Castings Co., Cleveland, Aug. 10, in that city. He had been with the company since 1920.

•
U. Grant Eagleston, former president, Eagleston-Parke Inc., Norfolk, Va., iron and steel jobber, in Norfolk, Aug. 5. He had been identified with the warehouse business over 50 years.

•
Robert B. Parker, 70, former sales executive of General Electric Co., Aug. 2 at his home in Woodstock, N. Y. For 38 years, until his retirement in 1933, he was associated with General Electric in Newark, N. J.

•
Charles F. Schenck, 62, manufacturer and salesman of machine tools, in Cleveland, Aug. 1. Mr. Schenck was part owner of Hess-Schenck Co., Cleveland, and salesman for the Toledo General Mfg. Co.

Peacetime Planning Now Aids Defense

■ IT IS fortunate that during the more than 21 years between the close of the World war and launching of our present national defense program, many ordnance experts in United States armories and arsenals not only have been designing and perfecting a wide variety of modern and highly effective weapons, ammunition and other military and naval supplies, but also have been thinking, experimenting and planning for their quantity production with standard industrial equipment.

This planning for production has been carried on despite the fact that until recently pitifully small appropriations have made it extremely difficult for ordnance engineers to put their production ideas into practice on much more than laboratory scale either in the armories and arsenals or in privately owned plants co-operating with them through educational orders.

Arsenals Are Laboratories for Developing Specialized Talent

For example, even the thoroughly modern, well planned and highly mechanized artillery shell production line at Frankford arsenal merely is a model setup which—according to good authority—might have to be multiplied as much as 500 times in order to turn out shells in sufficient quantities to meet wartime eventualities. The same thing is true to a greater or less degree of existing governmental setups for production of small arms, anti-aircraft guns, field artillery, heavy artillery and various other ordnance items which have no close counterparts in peacetime production—as is true of automotive and aircraft material.

It always has been an American principle that in normal times our government armories should be little more than repositories of highly specialized engineering talent, which otherwise would die out almost completely during extended periods

when national security does not depend upon armament. In periods of national danger, this specialized engineering talent is drawn out of the armories and arsenals to be spread as rapidly as possible throughout American industry—upon which in every crisis has depended in large measure mass production of the items which already had been designed in government plants.

Foundation for Mass Armament Production Has Been Prepared

Regardless of considerable expansion now taking place in these establishments, they still can be no more than nuclei of vast munitions manufacturing undertakings on the part of private industry—the possible extent of which seems to be too little realized at the moment. There is a tremendous task ahead for industry, but at least a substantial foundation has been laid by army and navy ordnance engineers who—as never before in our history—have designed with mass production in view and have gone to great lengths to work out practical production methods which rapidly can be copied and multiplied.

As industry gets into production on ordnance materiel, manufacturing methods will of course be modified and improved on the basis of experience. The fact remains, however, that ready-made plans should enable American industry to hit its stride in the race for national defense without stumbling through any such period of chaos as marked the beginning of our previous big drive toward preparedness in 1917.

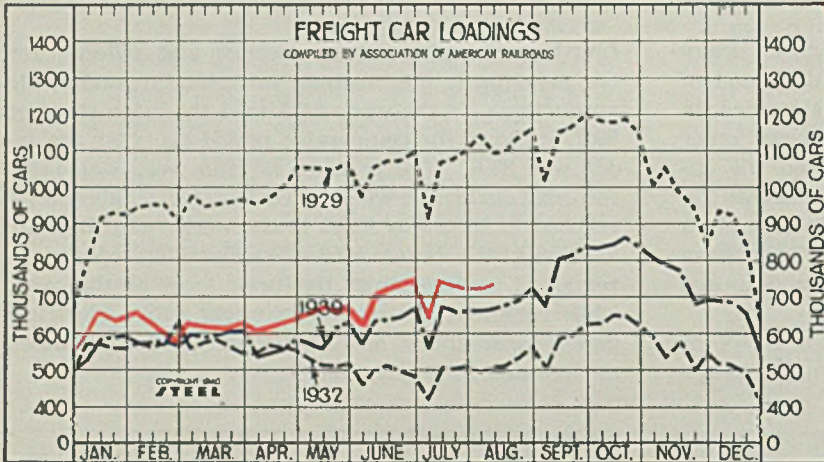
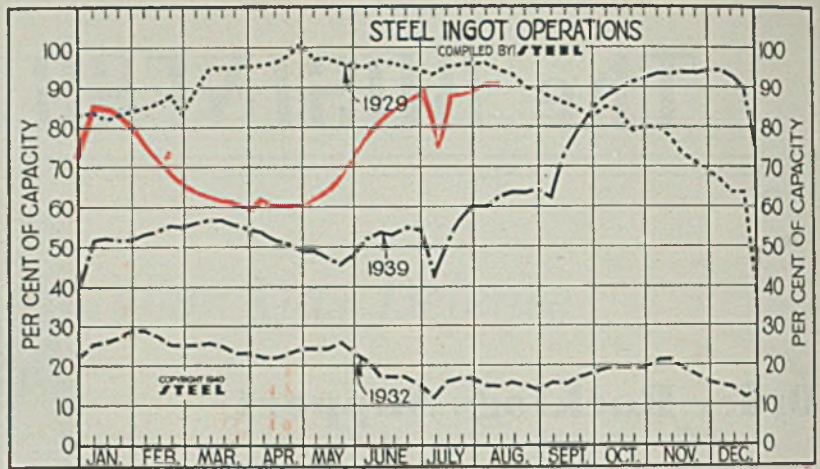
There is no time now to be wasted in stumbling around—fortunately there should be no occasion for it!

Guy Hubbard

Steel Ingot Operations

(Per Cent)

Week ended	1940	1939	1938	1937
May 11	66.5	47.0	30.0	89.0
May 18	70.0	45.5	30.0	91.5
May 25	75.0	48.0	28.5	75.0
June 1	78.5	52.0	25.5	75.0
June 8	81.5	53.5	25.5	74.0
June 15	86.0	52.5	27.0	75.5
June 22	88.0	54.5	28.0	74.0
June 29	89.0	54.0	28.0	77.5
July 6	75.0	42.0	24.0	74.0
July 13	88.0	50.5	32.0	82.0
July 20	88.0	56.5	36.0	81.0
July 27	89.5	60.0	37.0	84.0
Aug. 3	90.5	60.0	40.0	84.5
Aug. 10	90.5	62.0	40.0	84.0



Freight Car Loadings

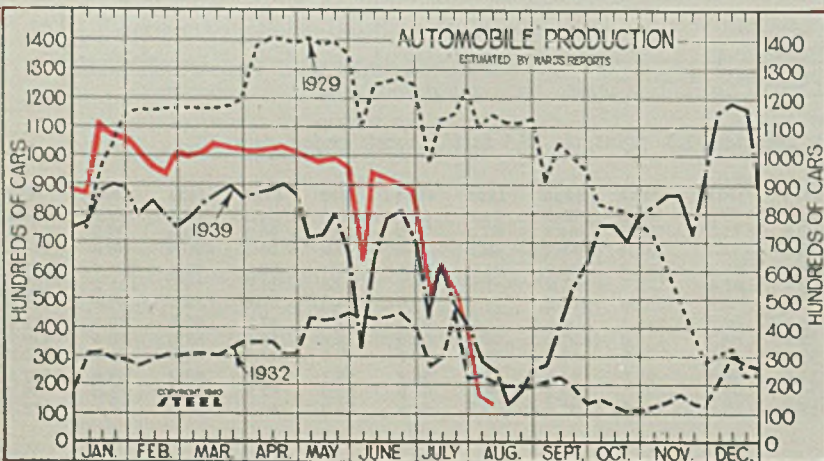
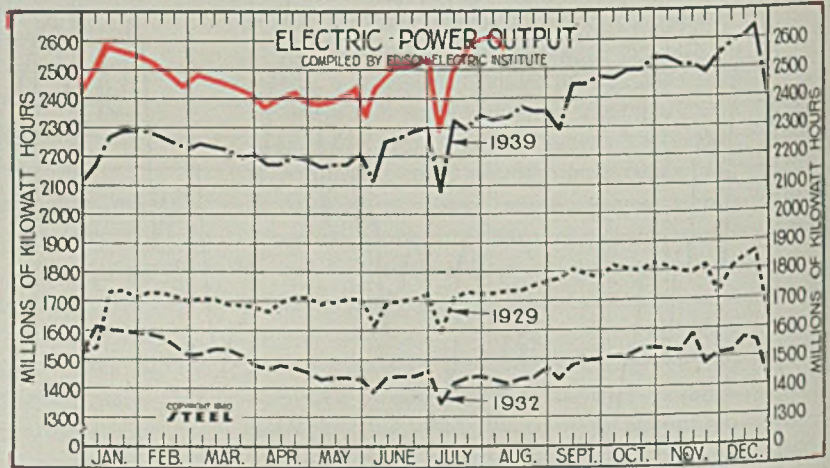
(1000 Cars)

Week ended	1940	1939	1938	1937
May 11	681	555	542	774
May 18	679	616	546	779
May 25	687	628	562	785
June 1	639	568	503	692
June 8	703	635	534	754
June 15	712	638	556	756
June 22	728	643	559	774
June 29	752	666	589	806
July 6	637	559	501	682
July 13	740	674	602	770
July 20	730	656	581	771
July 27	718	660	589	783
Aug. 3	718	661	584	770
Aug. 10	727	665	590	777

Electric Power Output

(Million KWH)

Week ended	1940	1939	1938	1937
May 11	2,388	2,171	1,968	2,195
May 18	2,422	2,170	1,968	2,199
May 25	2,449	2,205	1,973	2,207
June 1	2,332	2,114	1,879	2,131
June 8	2,453	2,257	1,992	2,214
June 15	2,516	2,265	1,991	2,214
June 22	2,509	2,285	2,019	2,238
June 29	2,514	2,300	2,015	2,238
July 6	2,265	2,088	1,881	2,096
July 13	2,483	2,324	2,084	2,298
July 20	2,524	2,295	2,085	2,259
July 27	2,601	2,342	2,094	2,256
Aug. 3	2,605	2,325	2,116	2,262
Aug. 10	2,589	2,333	2,134	2,301



Auto Production

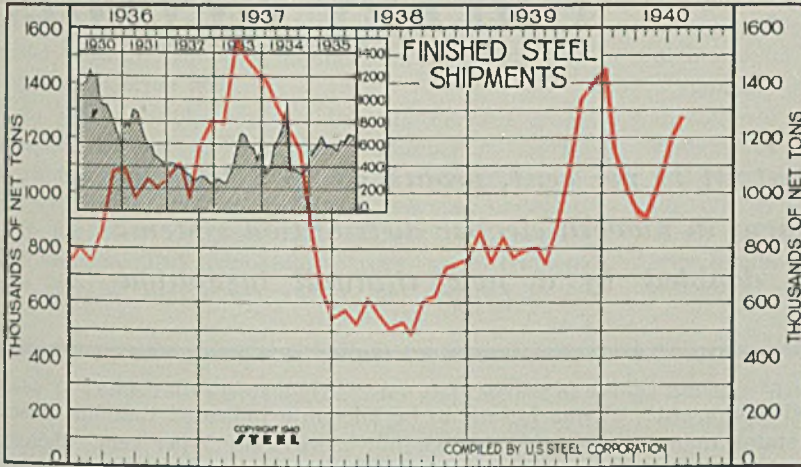
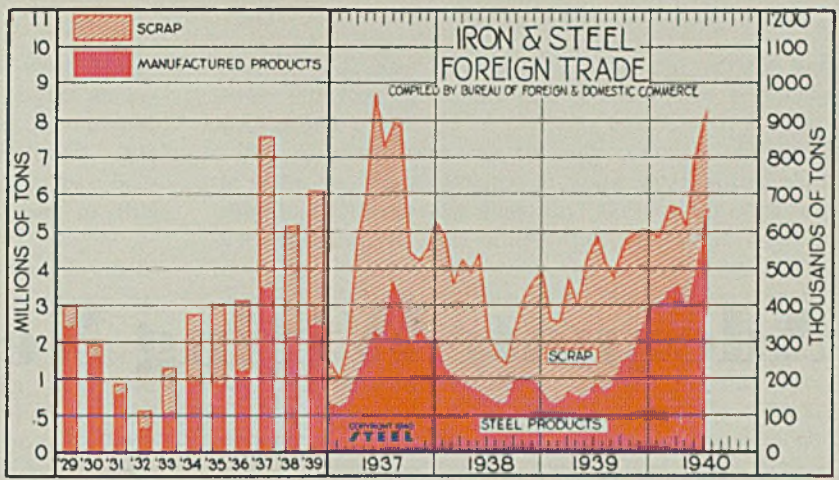
(1000 Units)

Week ended	1940	1939	1938	1937
May 11	98.4	72.4	47.4	140.4
May 18	99.0	80.1	46.8	131.3
May 25	96.8	67.7	45.1	131.4
June 1	61.3	32.4	27.0	101.7
June 8	95.6	65.3	40.2	118.8
June 15	93.6	78.3	41.8	111.6
June 22	90.1	81.1	40.9	121.0
June 29	87.6	70.7	40.9	122.9
July 6	52.0	42.8	25.4	101.0
July 13	62.2	61.6	42.0	115.4
July 20	53.0	47.4	32.1	88.1
July 27	34.8	40.6	30.4	86.4
Aug. 3	17.4	28.3	14.8	78.7
Aug. 10	12.6	24.9	13.8	103.3

Iron and Steel Exports

(Thousands of Gross Tons)

	Steel Products		Scrap		Total
	1910	1939	1940	1939	
Jan...	396.1	134.8	187.5	227.9	583.5
Feb...	436.6	134.8	234.7	224.9	671.3
Mar...	457.1	162.1	206.9	312.3	664.0
Apr...	391.8	153.9	221.2	240.1	612.9
May...	471.5	147.8	312.5	384.9	784.0
June...	617.7	190.0	318.4	398.9	936.0
July...	163.6	.....	.....	350.1	.....
Aug...	185.2	.....	.....	291.9	.....
Sept...	244.9	.....	.....	330.7	.....
Oct...	255.1	.....	.....	336.8	.....
Nov...	332.9	.....	.....	272.7	.....
Dec...	394.0	.....	.....	206.4	.....
Total...	2,499.0	.....	.....	3,577.4	.....



Finished Steel Shipments

U. S. Steel Corp.

(Unit 1000 Net Tons)

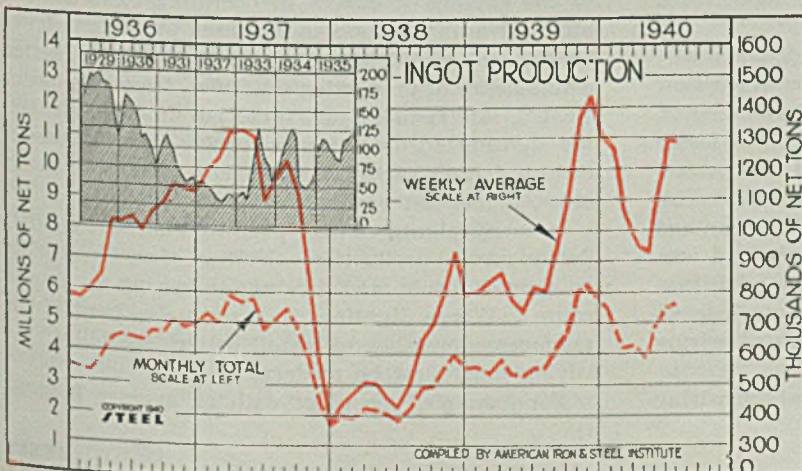
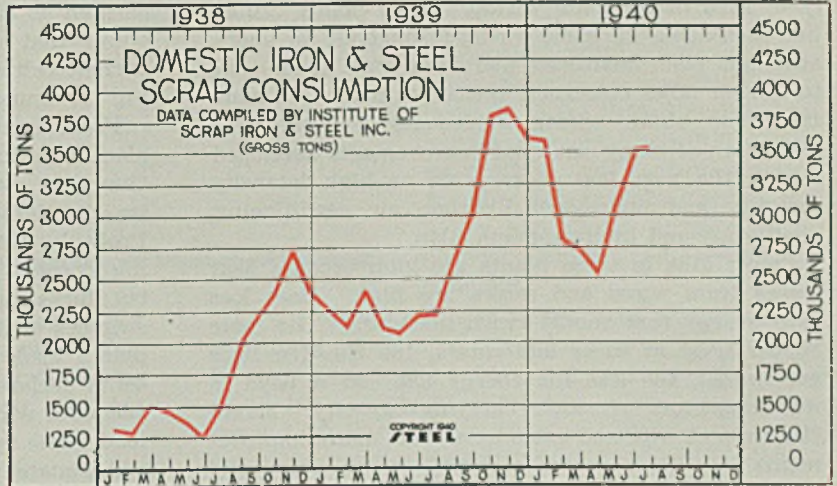
	1940	1939	1938	1937	1936
Jan...	1145.6	870.9	570.3	1268.4	795.2
Feb...	1009.3	747.4	522.4	1252.8	747.4
Mar...	931.9	845.1	627.0	1563.1	863.9
Apr...	907.9	771.8	550.5	1485.2	1080.7
May...	1084.1	795.7	509.8	1443.5	1087.4
June...	1209.7	807.6	525.0	1405.1	978.0
July...	1296.9	745.4	484.6	1315.3	1050.1
Aug...	885.6	615.5	625.9	1019.9	.....
Sept...	1086.7	635.6	1161.1	1060.7	.....
Oct...	1345.9	730.3	876.0	1109.0	.....
Nov...	1406.2	749.3	648.7	947.3	.....
Dec...	1444.0	765.9	539.5	1178.6	.....
Total...	11707.3	7315.5	14097.7	11905.0	.....

†After year-end adjustments.

Iron and Steel Scrap Consumption

(Gross Tons)

	1940	1939	1938
	(000 omitted)		
Jan...	3,581	2,257	1,331
Feb...	2,812	2,124	1,306
Mar...	2,728	2,419	1,543
Apr...	2,548	2,114	1,477
May...	3,061	2,079	1,387
June...	3,482	2,221	1,257
July...	3,526	2,247	1,520
Aug...	.....	2,675	1,953
Sept...	.....	3,018	2,218
Oct...	.....	3,809	2,393
Nov...	.....	3,858	2,732
Dec...	.....	3,613	2,411
Total	.....	32,434	21,528
Mo. Av.	3,035	2,703	1,794



Steel Ingot Production

(Unit 100 Net Tons)

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

†Weekly average.

Adequate Wiring Needed Badly

. Survey Reveals

One plant increases output 14 per cent, profits go up \$11,400 as result of \$2700 investment in modern electric distribution system.

Conduit capacity is doubled by a new thinwall insulation

■ DURING a recent survey of electrical equipment in New England and the middle Atlantic states, many metalworking plants and steel mills were found badly in need of adequate wiring. Some plants visited had been using the same wiring throughout for years, although plant additions had been built from time to time or other construction changes made. In more than one plant, wiring inadequacy is preventing utilization of many electrical improvements developed during the past few years, such as high intensity mercury and fluorescent lighting, air conditioning, ventilation and intercommunication.

Power bills in these plants are high because heat losses from wires and cables are high. Heat loss saps energy that should reach machines. The more copper used in wires and cables, the less the lines are heated, the less the energy loss—so it pays to use conductors of ample carrying capacity. Manufacturers of wire and cable have built many improvements into their products during recent years and too few plants are making use of these modernized materials.

Twinned with energy losses from inadequate wiring were reports of excessive voltage drops which slow down machine operation, increase production costs, cause tie-ups in the flow of work—all hidden losses that do not appear on the profit and loss statement, hence, are usually overlooked. In some cases, the plants had installed new motors, switchgear and other electrical equipment but retained the old wiring circuits "as is." Instead of getting the full savings from such modernization, many plants lose almost as much as before because antiquated wiring was taxed greater than before.

Tests made with analyzers in plants where wiring

was known to be adequate indicated that line losses should average not more than 5 per cent, whereas in plants with obsolete wiring, line losses often run as high as 30 per cent. Managements pay for much power that never reaches motors or machines, the current being dissipated by inadequate wiring. Paying for unused power is the penalty of poor wiring.

From conversations with maintenance men and plant superintendents, we found they tolerated their "haywire" systems largely because they did not realize the derogatory effect on processing and costs. Probably, this is because the high cost of poor wiring doesn't jump out at you like a high tax bill but lurks unseen in small sized wires, overloaded switches and long meandering circuits common to plants inadequately wired. Many plant superintendents declared that they could not afford to install adequate wiring when they really cannot afford the inadequate systems they now use.

Adequate wiring costs little to install compared to the savings it effects in operating costs and the other advantages, such as increased production, fewer breakdowns and delays, lower insurance rates, better maintenance of production schedules, fewer man-hours wasted, less spoilage and breakage of materials, better lighting for less money, fewer cancellations of orders, better satisfied customers, lower production costs, higher net profits.

In many plants visited, poor lighting was a costly detriment to production. Voltage drop contributes to poor lighting and inadequate wiring is a main cause. Where lighting is inadequate, even if the management wishes to install better "seeability," the wiring must first be modernized.

For example, one plant with an average light in-

tensity of 9 foot candles replaced 300-watt lamps with 500-watt lamps, expecting better light at reduced cost. However, due to increased line losses, actually only 8 foot candles were developed. We estimate that a 10 per cent voltage drop on two 500-watt lamps, will cost around \$35 a year in this plant.

We found the insulation of wires and cables deficient more or less in 75 per cent of the plants reviewed.

Brittle and dried-out insulation sooner or later develops cracks and breaks away under vibration. Maintenance men reported that shorts had stopped production in some of these plants. In one plant, a fire resulted from poor insulation. Heat subjects wiring to deterioration. So do other factors common to steel mills and metalworking plants such as alkalies, moisture, sunlight, submersion, arcs and other forms of external heat.

To get some idea of the benefits derived from adequate wiring, we reviewed a number of metalworking plants where the wiring had undergone complete modernization and give these few case histories.

In one New England plant where small motors had been installed from time to time, an instrument test revealed that power factor had dropped to 36

care of increased production. The old wiring has been left "as is," hence the circuits are seriously overloaded.

Where wires were run through conduits imbedded in walls, the managements, in some cases, stated that they had had surveys made and the cost of rewiring was prohibitive. We know that the high cost of rewiring with conduit when the old raceways have been imbedded in concrete walls, has prevented many plants from rewiring. This was such a stumbling block to sales of adequate wiring that wire manufacturers have been working on a solution for years. At last it has arrived. With the introduction of small diameter building wire, wiring adequacy may be obtained for a fraction of former cost, even where conduits are imbedded in walls. So there is no longer a legitimate reason for not rewiring such plants or office buildings.

Building wire with thinwall insulation is designed to increase the circuit capacity of existing electrical systems by permitting wires of larger copper cross sections to be put into existing conduit. This is possible by using new thinner insulation which holds down the overall diameter of the wire. This new wire makes adequate wiring a reality for those plant managements that realize the importance of adequate wiring, but were stymied

because of the high cost of replacing with larger conduit formerly necessary to accommodate heavier copper. Plants now can double their present electrical capacities without replastering or repairing, without repanelling or re-decorating. Millions of feet of this new type wire are operating satisfactorily in the United States navy, federal, municipal and utility communication and control systems, and now, it is available for lighting, power and feeder circuits in industrial plants and commercial buildings.

Table I—Comparative Outside Diameter and Current Loadings Building Wire

A. W. G. Size	Outside Diameter—Inches		Rated Current Carrying Capacity	
	Ordinary Type R building wire	Thinwall small diameter building wire	Ordinary Type R building wire	Thinwall small diameter building wire
14 solid	.190	.130	15	18
12 "	.210	.147	20	23
10 "	.230	.168	25	31
8 "	.280	.227	35	41
6 stranded	.380	.314	45	54
4 "	.450	.363	60	72
2 "	.510	.423	80	96
1 "	.570	.496	91	110
1/0 "	.630	.537	105	127
2/0 "	.670	.583	120	145
3/0 "	.730	.634	138	166
4/0 "	.780	.692	160	193

per cent, feeders were heated and overloaded. After the wiring system was modernized, the power factor jumped to 80 per cent, heating and overloading of feeders and motors ceased, power costs were cut 38 per cent or a saving of \$140 monthly.

In another plant, this time in Pennsylvania, the insulation was in terrible shape, hanging off in places, Overloads heated feeder circuits dangerously. The manufacturers invested \$1200 in adequate wiring and saved this cost in seven months or a cut of about \$150 monthly in power expense.

A plant superintendent in New York state reported that production was increased 14 per cent after rewiring. Before that time, electric circuits had been seriously overloaded. The increased profit, due to more efficient production and lower costs, totaled \$11,400 on an investment of \$2700 in a modern distribution system.

Probably 90 per cent of the wiring inadequacy in metalworking plants results from additions and changes made during the past few years to take

Code practice has been to limit the fill of raceway containing more than 3 conductors to 40 per cent. In many plants and commercial buildings, this limit of fill has already been reached so rewiring for increased loads the old way means ripping out walls and replacing the conduit. With thinwall insulation, it simply means pulling out the old wires and putting in new wires.

For example, the maximum wattage of conventional insulated wire in a conduit at 40 per cent fill is four No. 14 type "R" conductors, which give two circuits having 15 amperes capacity each or 3450 watts. No more space is available inside the conduit to get increased load with ordinary type R rubber insulation. But by using new thinwall insulation, the wattage can be increased without increasing the percentage of fill in the conduit. In other words, eight No. 14 thinwall conductors in the same size conduits will give four circuits having 12.6 ampere capacity each or 5800 watts.

To give another illustration. Where two single

phase circuits have been installed in 1/2-inch conduit, previous national electric code requirements permitted only four No. 14 wires to be installed. Using thinwall building wires, these conventional conductors can be replaced with four No. 10 wires. The total circuit wattage will thereby be increased from 2800 watts to 5700 watts. In a lighting circuit this means that the lamps can be doubled in size merely by using thinwall insulation instead of ordinary rubber insulation.

From the accompanying tables, it is apparent that the small diameter building wire has, roughly, 20 per cent greater ampere carrying capacity than ordinary building wire of the same copper size. Since the amount of copper is identical in both cases, many may wonder how this is possible. The National Electrical Manufacturers association reported that this new insulation has such outstanding aging and heat resisting qualities that it may be operated at a temperature of 75 degrees Cent. continuously. The temperature limitation of standard rubber covered building wire, type R, is 49 degrees Cent. and this is a limitation of the temperature of the ambient rather than the temperature of the insulation, since such insulation deteriorates rapidly when subjected to temperatures greater than 50 degrees Cent.

Coverings Made Better

This new heat resistant insulation makes it possible to produce a building wire of smaller overall diameter and occupying less space in installation. Then because of its higher permissible operating temperature (75 against 50 degrees Cent.) it effects an appreciable increase in current carrying capacity, making it possible to lower the installation cost for a given kilowatt load.

The conductor coverings developed by various wire and cable manufacturers for thinwall wire differ in types of materials used in overall dimensions. Some conductors are insulated with rubber, others with synthetic compounds. While thinwall building wire has essentially the same characteristics as any standard rubber covered conductor, special insulating processes have been devised. One manufacturer, for example, subjects the rubber to purification making it possible to eliminate more than 90 per cent of the original water-soluble materials which greatly reduce insulating qualities. The highly purified rubber is mixed with the required electrically high grade vulcanizing materials, anti-oxidant and accelerators. Special protective agents and compounding methods give the insulation excellent electrical properties. The compound is applied to

the wire by immersing the wire and withdrawing it vertically into a drying tower. This is repeated until the desired thickness is built up. Such insulation with excellent electrical properties makes it possible to meet a given set of electrical requirements with less than half the insulation wall needed for standard insulating compounds. Such wires have only about half the overall area of wires with conventional insulation and therefore are particularly well suited for steel mills and metalworking plants where savings in conduit area and weight of wire are important.

Future Expansion Disregarded

Another highly important factor disclosed by this field study is that too little consideration is given to future expansions. The tight wires in conduits, as much fill as was allowed under the code, indicated in plant after plant that installations were made without an eye to the future. So consider future requirements when modernizing wiring. Many changes taking place in steel mills and metalworking plants call for increased loads and more electric power. If provisions for expansion are made when rewiring, expensive adjustments will be eliminated. Service equipment, feeders and subfeeders should be large enough and correctly planned to answer future requirements.

In administrative buildings connected with steel mills and metalworking plants, numerous instances of tight wiring prevented the installation of more outlets, additional equipment for doing office chores electrically, high intensity mercury lighting and electric ventilation—all requisites to better employee morale, more wholesome working conditions, fewer errors, more efficient workmanship.

It's time to re-wire for bigger profits.

Film on Rotary Head Die Miller Available

Because the new rotary head die milling machine offers so many possibilities under existing conditions, Kearney & Trecker Corp., 6784 West National avenue, Milwaukee, has just completed a colored film which pictures practical applications of this miller and its attachments in the production of tools and dies.

Available both in a silent and sound edition, this motion picture has a running time of approximately 20 minutes. It is technical in nature and is not injected with sales promotion. The company is inviting machine tool groups, such as production executives, superintendents'

and foremen's clubs in industrial plants, to show this film at their meetings.

Electric Gages Save Production Time

Definite savings in production are being made by Florence Stove Co., Kankakee, Ill., through the use of General Electric thickness gages to measure the thickness of porcelain enamel applied on steel parts of its gas ranges. These gages also are used to check the color of the enamel being applied because each color varies with the thickness.

Former methods entailed weighing steel parts of the stove before and after they had been coated with enamel, and while the enamel was still wet. In addition, it also was necessary to keep a mass of records of each batch of parts going through.

Utility Co. Contracts For Huge Boiler

Montaup Electric Co., Fall River, Mass., has placed a contract with Combustion Engineering Co., 200 Madison avenue, New York, for a large high-pressure forced-circulation boiler to be installed in the Somerset, Mass., power station. It will be designed to produce 650,000 pounds of steam per hour at a pressure of 2000 pounds per square inch and a temperature of 960 degrees Fahr.

The steam will be delivered to a new 25,000-kilowatt turbine that is being supplied by General Electric Co., Schenectady, N. Y. From this high-pressure turbine, the steam will flow to the turbines now in use in the plant, producing an additional 47,000 kilowatts.

Ground bituminous coal will be the normal fuel but the boiler also will be equipped with oil burners so that either fuel may be used.

The boiler differs from others used for power generation in that centrifugal pumps are provided for circulating the water through the boiler heating surfaces. Advantages of this system are that it provides a solution of the difficult circulation problems sometimes encountered in high-pressure high-capacity units of the natural-circulation type; that it permits a more compact arrangement of heating surfaces, and that in both design and construction it is especially adaptable to operation at high capacities in conjunction with high pressures and temperatures.

While boilers employing this principle of circulation have been used in Europe in both land and naval installations, this is said to be the first boiler of this type to be used by the electric power industry in the United States, and the largest ever contracted for in any country.

Steel Hardenability

as Related to

Physical Properties



Test data indicate there is no direct relationship between end-quenched hardenability, or the facility with which a maximum hardenability is reached, and ductility in the tensile test

By **GORDON T. WILLIAMS**
Metallurgist
Deere & Co., Moline, Ill.

that large differences in hardenability may be found (by hardenability testing) which are not indicated by standard chemical analyses or grain size determinations. The divergence of results on steels of one type were found in some instances to be greater than that between one S.A.E. type and another.

Such being the case, it is obvious why there is so much current interest in hardenability testing; if such differences can be eliminated, controlled, or taken into consideration, it will be possible to heat treat steel parts to closer limits in mechanical properties; the factor of safety (factor of ignorance) may be reduced with more complete utilization of the latent qualities of alloy steel.

This variation to be found in hardening response is of no concern to the heat treater who has but one or a few pieces to harden; he can test and draw repeatedly as required to bring the steel parts to closely similar hardnesses and, thus, similar properties. But in large-scale industrial operations, where similar parts of supposedly identical steel are being more or less continuously hardened, standard processes must be set up to insure adequate results from the steel of poorest response, and, by the same token, hardness tolerances must be liberal.

An allowable range of, say, 285-341 brinell for a given part is today

quite orthodox; but note that this is a tolerance of almost 20 per cent which will be directly reflected in tensile strength. At the same time, the designing engineer must allow for this range. If a given steel will have adequate toughness up to 341 brinell, then the designer could use to advantage the tensile figure for this hardness, but at present he cannot, since provision must be made for the spread or scatter of results to be expected. A more efficient employment of steels will result if hardening response of steels of one type can be brought under closer control.

Progress is being made in this respect. First, and most important, certainly, our knowledge of the existence of these wide variations and their independence of usual chemistry and grain size is a substantial step forward. Second, methods for determination of the hardenability of steels currently available present opportunities for regulation of heat treating procedures in advance.

Attempts to predict hardening response by chemical analysis alone were the basis for the S.A.E. classification system. Later, it was found that grain size after carburizing at 1700 degrees Fahr. explained some of the differences between steels of identical chemistry. Still more recently, grain size of the austenite at the time of quenching was discovered to be an even better indicator of probable results. And now interest centers on hardenability itself; except that, instead of trying to make chemistry or grain size accept responsibility for predicting

■ IN THE last few years, no subject has so aroused the interest of ferrous metallurgists as has "hardenability." The determination of the precise manner in which a given steel will react to quenching under definite conditions, and the study of causes of variation in response, have been the subject of several recent contributions to the technical literature (a selected bibliography is appended) and work along such lines is today being carried out in many laboratories.

And it is not surprising that it should be so. Successful heat treatment demands uniformity of hardening response; the better this uniformity, the more reproducible will be the results and the lower will be the scatter of properties attained. Heating temperatures and times can be quite closely controlled; regulation of ambient atmospheres and, consequently, of nature and amount of scale formed (which is a potent factor in hardening resulting from quenching) can be carried out with adequate satisfaction; quenching media have predictable properties; the largest variable is the steel itself.

Of course, steels of one type, one S.A.E. number, harden normally to the same general degree, but moderate variations from heat to heat of the same steel type, perhaps even from bar to bar, may give rise to differences in hardening response, and hence in useful mechanical properties, much greater than average differences between types. The author showed in a recent paper (1)*

*Figures appearing in parentheses refer to bibliography at end of article.

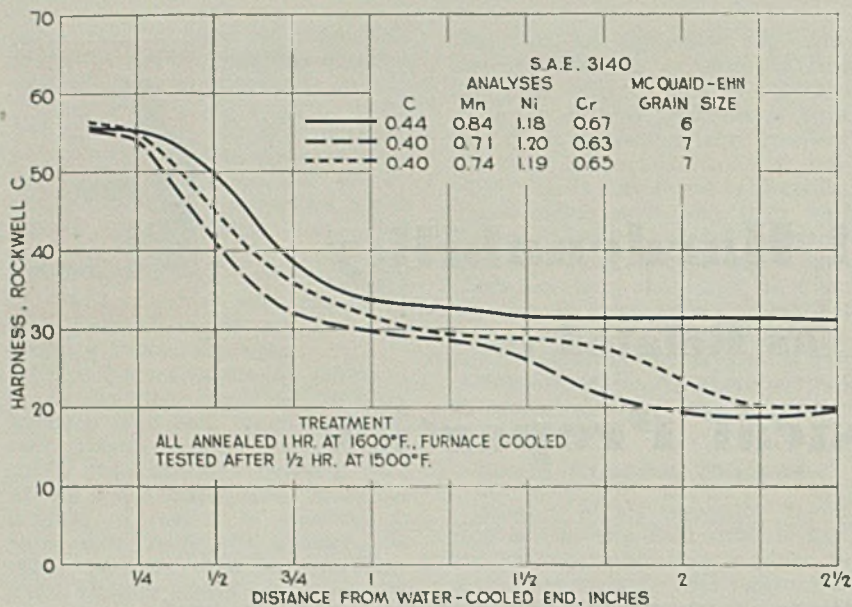


Fig. 1—End-quenched hardenability versus heating cycle for three S.A.E. 3140 steels closely similar in chemical composition and grain size

hardenability, we test directly for what we are concerned with!

In connection with chemistry of steels, it is appropriate to refer to the work of Janitzky, well summarized in the *Metals Handbook* (1939 edition, p. 515) which clearly shows that within usual heat treating limits, the several alloy steel types show identical ductility in the tensile test if hardness and hardenability are the same. Consequently, emphasis on rigid limits for chemical analysis is unwarranted, especially since this will not guarantee uniformity of properties after heat treatment.

It may therefore be expected that hardenability determination and control will continue to occupy the interest of ferrous metallurgists and to an increasing extent in the future. Much data has been published in the last two or three years, which is sufficient in quantity and scope to reveal the differences to be expected between various steels and to suggest the necessity for further testing and for developing methods of controlling hardenability of commercial steels.

Hardenability testing on a quantitative basis is carried out by either of two methods. In the first, by no means new, a round bar is heated and quenched then suitably sectioned and hardness readings taken on the circular cross-section. Results of such traverses may be plotted so that a graphic picture of hardening result is given. At each point a hardness is found which depends on the cooling rate, that is, the effectiveness of the quench, at that point.

Since all steels have a critical cooling rate which must be exceeded

if full hardening is to ensue, obviously there will be for every steel some size of bar which will cool slowly enough at subsurface points that hardening will not occur at those points. If rounds of various sizes are used, it is found that the plotted curve varies with size and at some size depending on the characteristics of the steel, the whole cross-section will be hard; a system of hardenability designation and of quench effectiveness rating on this basis has been carefully developed by Grossmann (2). A system of testing and rating of 1-inch round sections was proposed by Burns,

Moore, and Archer (3), and has been amplified by Burns and Riegel (4) to give an excellent and comprehensive picture of the hardening characteristics of carbon steels.

Alloy steels, however, harden entirely through a 1-inch section ordinarily (5), and rating by this method is not feasible; use of some larger diameter bar would give useful results, but the difficulty of obtaining desired steels in large rounds, and the necessity of cutting the section by abrasive wheels frequently make such a method undesirable.

Jominy and Boegehold (6, 7) accordingly developed a very different procedure for determining hardenability of alloy steels. In their method, a specimen is heated as desired, then water quenched on one end only; the effect of the quench decreases away from this end, and a variety of cooling rates occur along the bar. Hardness testing along an axis normal to the quenched face shows hardness resulting from the various cooling velocities.

The writer in an investigation of this method (1) found that diameter and length of specimen are essentially without effect; however, standard practice is to use a specimen 1-inch in diameter by 2 3/4-inches long, quenched on one end by water at 75 degrees Fahr. On such a specimen cooling rates occur all the way from that resulting from a practically perfect quench to less than that obtaining at the center of a 4-inch round quenched in oil. Thus the evaluation of alloy (deep-hardening) steels is made possible by a simple and easily performed test.

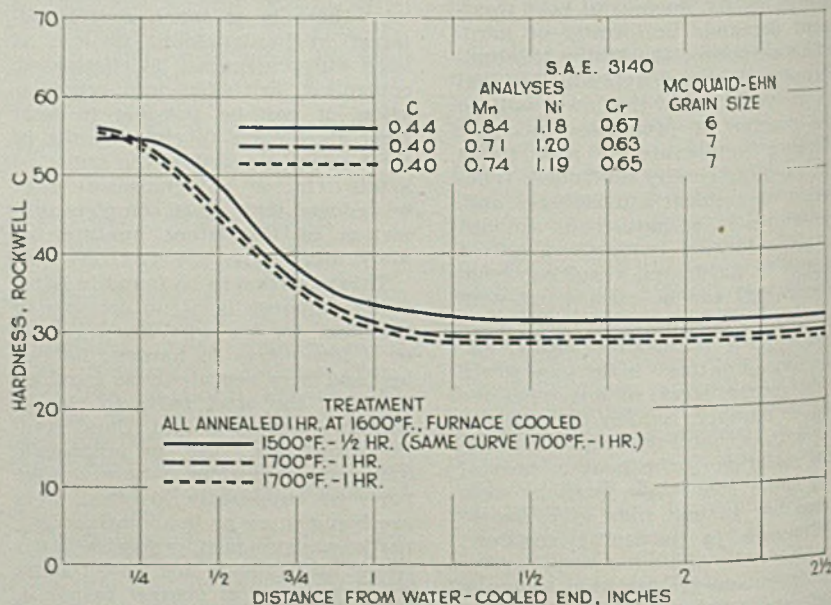


Fig. 2—End-quenched hardenability versus heating cycle for the three S.A.E. 3140 steels shown in Fig. 1 when heating time is varied to produce substantially identical hardenability values in the three steels



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the test has also been found useful for cast irons.

Several papers have been presented giving data on hardenability results determined by this end-quench test method, and it is to be expected that before long there will be sufficient information available to clarify the picture on alloy steels and establish a more sound basis for their selection and use.

By this test the writer demonstrated (2) that wide variation may be encountered between steels closely similar in chemical analysis and grain size, as mentioned earlier. These variations are of two sorts. There are large differences in hardenability between closely similar steels when tested after a normal short time at heat; Fig. 1 gives a series of curves demonstrating this point. The variations here shown could not be explained by customary chemical analysis or grain size determination.

There are also important differences in the time for which different steels must be held at heat before quenching if maximum available hardenability is to be achieved. Fig. 2 illustrates that hardenability may by suitable heating procedure be brought to substantially identical values in these same steels; many other cases of like nature have been encountered. These differences cannot be inferred from the usual chemical analyses nor from grain-size but may well relate to a diffusion factor, the relative ease of forming homogeneous austenite. The underlying cause is not known; a fertile field for study lies herein. An answer to this implicit problem would result in the ability to make alloy steels of maximum, uniform, and

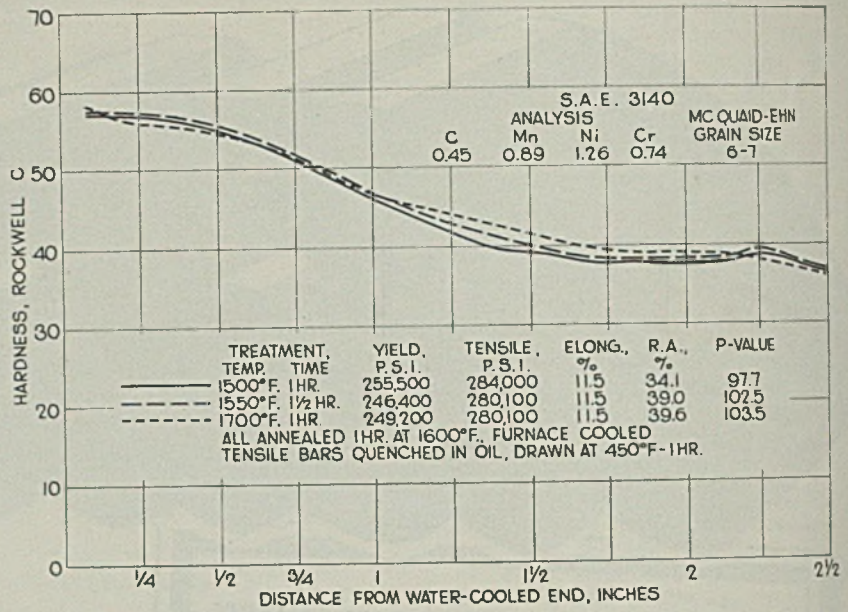


Fig. 3—End-quenched hardenability and ductility index versus heating cycle for S.A.E. 3140 steel

predictable hardenability, and would permit a considerable tightening of heat treating tolerances, with consequent more efficient utilization of steels.

There is undoubtedly a very close connection between this problem and the high hardenability attained by the "Grainal" deoxidation treatment (8). "Grainal" treated steels show very fine grain size, a high degree of normality, and very high hardenability. The hardenability increase on simple steels is equivalent to that expected from addition of a substantial percentage of alloying elements, and cannot reasonably be thought resultant from the perhaps

0.03 per cent residual vanadium content accompanying "Grainal" treatment. In fact, the writer understands that similar results are attainable by more recently developed cheaper deoxidizers which do not contain important amounts of vanadium.

If it is found possible cheaply to produce low alloy steels having the hardenability of higher cost, high alloy steels, then, in accordance with the work of Janitzky previously mentioned, these cheaper steels will give the same, or better, physical properties and with greater assurance of uniformity.

Accompanying the high hardenability of "Grainal" deoxidized steels there have been found to occur superior physical properties as regards ductility and impact. One criterion of steel quality which has been used to some extent recently is the so-called "P-value" merit index developed by R. B. Schenck of Buick Motor division, General Motors Corp. A special tensile specimen (similar to Fig. 40 on p. 666 of the 1939 edition of the *Metals Handbook* is quenched as desired, then drawn at 425-450 degrees Fahr.; ends are drawn higher in lead, to eliminate breaking in jaws of the testing machine, and the gage length is polished after treatment to 0.505-inch diameter. Tensile and yield strength, elongation and reduction of area are measured as usual.

The P-value index is obtained by the formula: Tensile strength plus six times reduction of area divided by five. The latter division is simply to give a numerical value near 100. Like all merit indices it has limitations, but has been found useful for steels which require high ductil

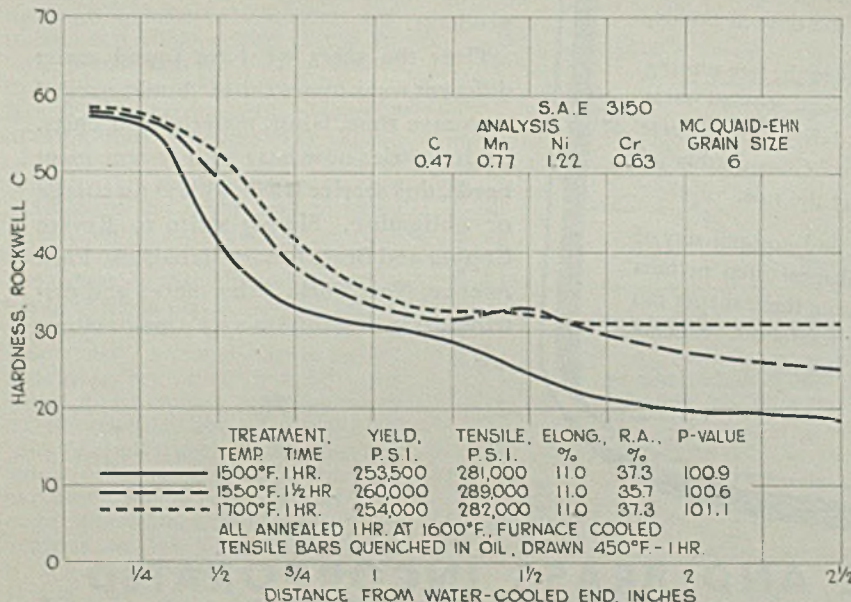
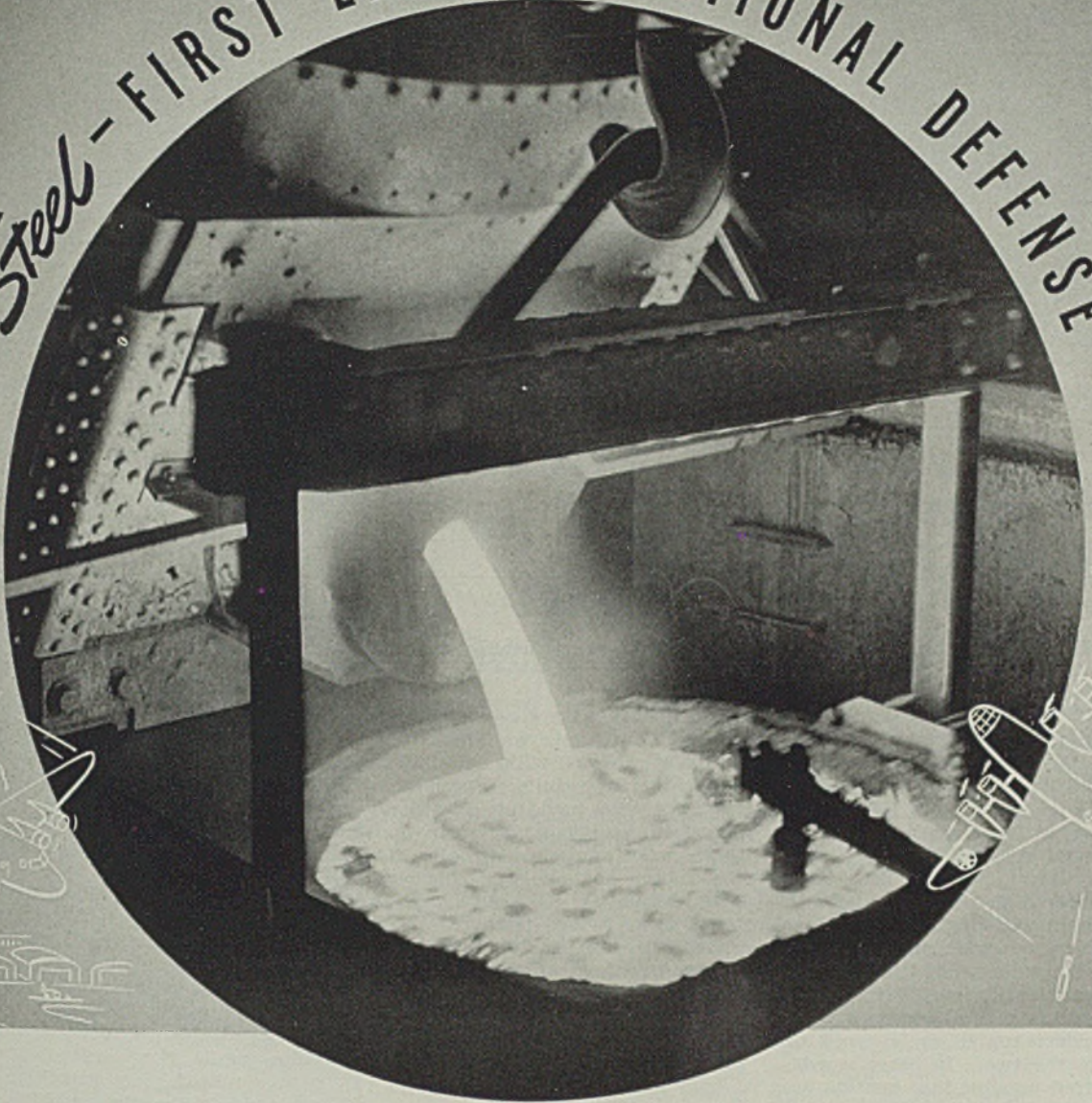


Fig. 4—End-quenched hardenability and ductility index versus heating cycle for S.A.E. 3150 steel

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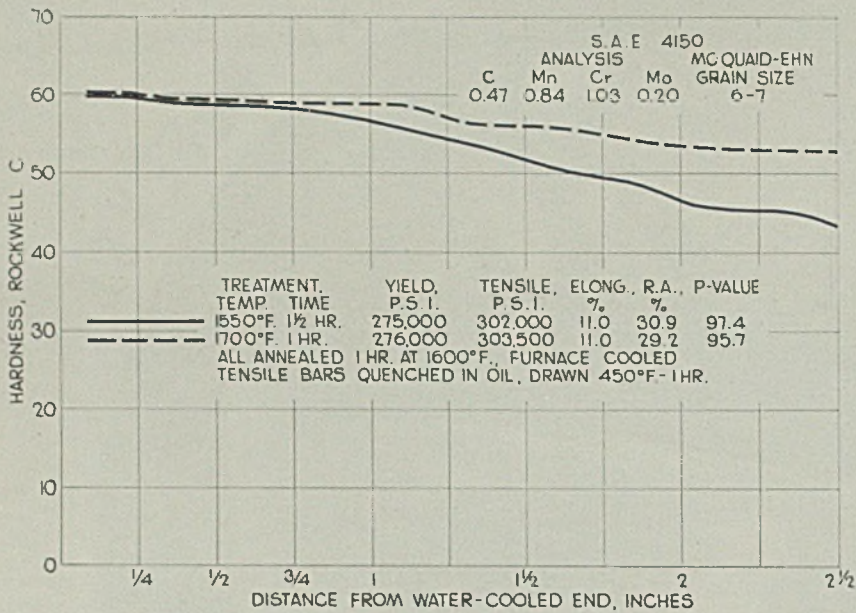


Fig. 5—End-quenched hardenability and ductility index versus heating cycle for S.A.E. 4150 steel

ity at high tensile strengths. Ordinary steels will give P-values of 80 to around 100, while "Grainal" treated steels will give from 100 to 120, indicative of the high reduction of area found on the latter.

Since these specially deoxidized steels show high hardenability, and the writer had found ordinary alloy steels to show variations in hardenability depending on time-temperature combination of heating prior to hardening, several series of tests were undertaken in an attempt to correlate the two. In other words, it appeared possible that heating ordinary alloy steels sufficiently to develop maximum hardenability might also have an effect on the ductility or P-value.

Also it was thought desirable to determine whether the "Grainal" treated steels showed such variations in hardenability with time and temperature of heating as did ordinary steels: if the essential action of "Grainal" is to provide a structure which readily attains a high degree of homogeneity of austenite, then long heating times should not show an improvement in hardenability. The hardenability test method used was that of end-quenching previously mentioned. Equipment and procedure was as described by the writer elsewhere (1).

In essence, the specimens were heated so that no scaling occurred on the end to be quenched; time at heat and temperature of specimens were closely controlled; Rockwell hardness readings of the hardened specimen were taken along a ground axis at intervals of 1/16-inch for the first inch, 1/8-inch thereafter. In several cases duplicate specimens were run, and occasionally

an additional axis was tested for hardness always with satisfactory duplication of results. Special tensile bars were made up, as already described, for P-value determination; these were quenched in oil after the desired heating cycle, and were then drawn at 450 degrees Fahr. for 1 hour before testing.

One series of tests was run using a fine-grain heat of ordinary S.A.E. 3140. The hardenability of this heat, as shown in Fig. 3, was found not to vary appreciably with change in temperature and time of heating; 1 hour at 1500 degrees Fahr. and 1 hour at 1700 degrees gave very nearly identical hardenability curves.

Similarly treated special tensile test bars were run, with the results listed with the curves of Fig. 3. It will be noted that the P-value increased from 97.7 to 103.5 as quenching temperature was increased, and that an intermediate temperature gave an intermediate P-value. Here is a steel whose P-value increased, while the hardenability did not change, with increasing heating prior to quenching.

Another series, on an ordinary S.A.E. 3150, is shown in Fig. 4. This is a heat of steel which had been quite thoroughly investigated for hardenability previously and found to be sensitive as to time and temperature of heating. It will be seen that, while the hardenability varied considerably with heating cycle, the P-value was not affected to any noticeable extent.

In still another series, a standard S.A.E. 4150 was studied, with the results shown in Fig. 5. This steel had also been extensively tested in previous work in hardenability. Although hardenability was definitely greater after quenching from a higher temperature, the P-value was slightly decreased from the higher temperature.

Thus, in the three series of tests shown in Figs. 3, 4 and 5, three different relationships are to be seen. One steel, Fig. 3, increases in P-value with increasing quenching temperature while the hardenability is unchanged; another, Fig. 4, does not change in P-value while hardenability is markedly improved; and the third, Fig. 5, decreases in P-value while the hardenability improves with higher quenching temperature. Other test results could

(Please turn to Page 80)

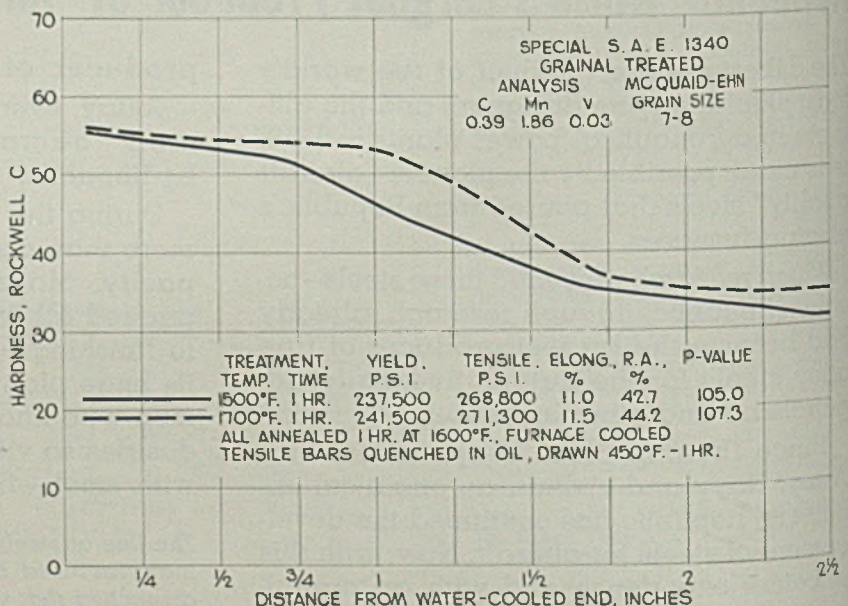
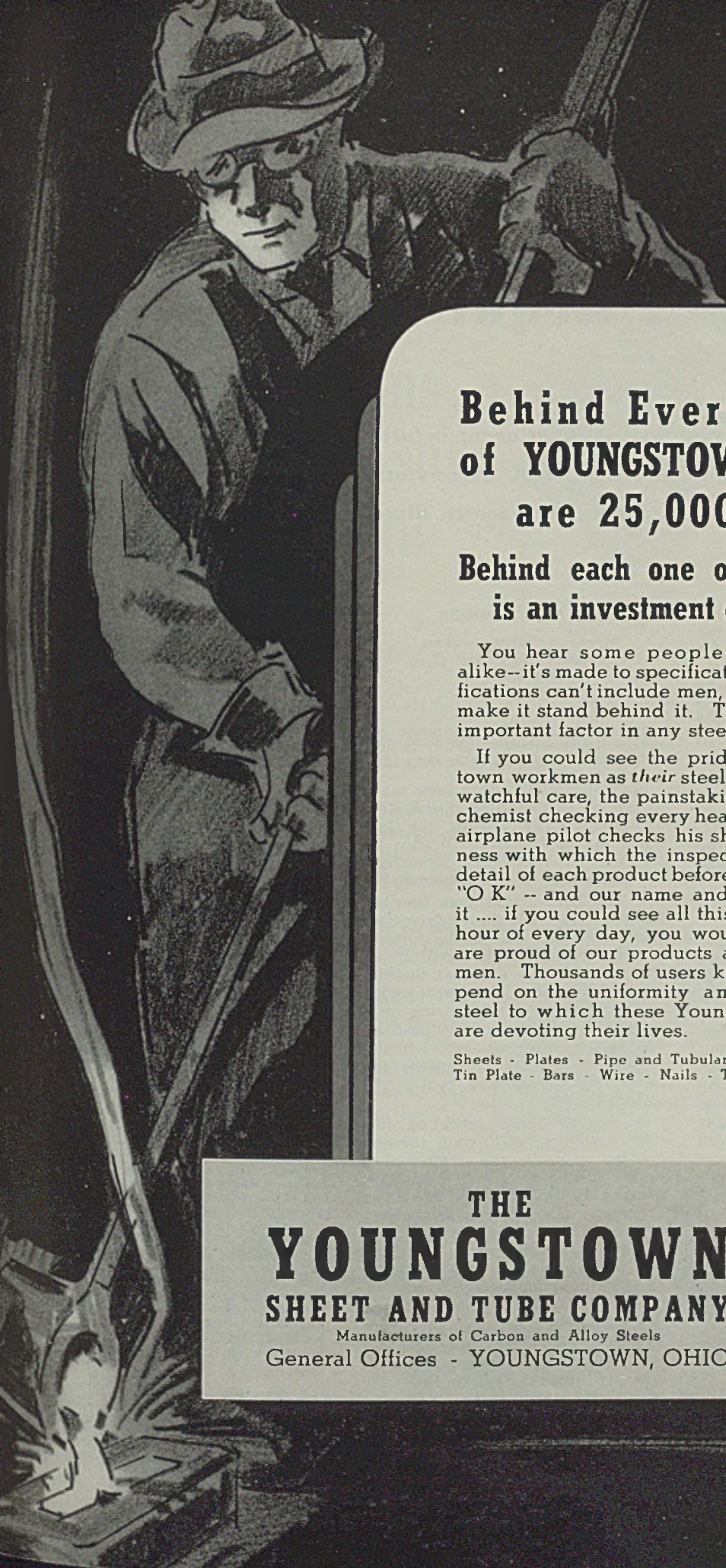


Fig. 6—End-quenched hardenability and ductility index versus heating cycle for special S.A.E. 1340 Grainal treated steel



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Tolerance Requirements*

Engineering developments must occur before the trade may expect the process of hot rolling steel to economically produce commodities which will meet more severe dimensional specifications

■ MATERIAL progress has been made in tolerance control since the subject first became a matter of importance to the steel industry. The improvement has been due in part to the requests of the user for material closer to theoretical weights and dimensions, in part to improvement in rolling mill machinery, and in part to a better understanding of the laws governing the flow of steel at rolling temperatures. Chiefly, however, the improvement came because what was once an art has become a subject for engineering analysis.

Heating

A constant and uniform finishing temperature is a most important basic factor in the control of dimensional variations. It is not only necessary that the heating temperature be uniform throughout the entire length of a given piece, but also that the temperatures of successive pieces be approximately equal. Reheating furnaces as usually constructed for finishing mills possess certain limitations which prevent attaining the ideal of these conditions because:

1. It is difficult to heat ends of billets or slabs to the same temperature as the center. This is particularly troublesome in a continuous type of reheating furnace when the length of the successive pieces is different.

2. The steel is reheated in part by radiation from refractory surfaces having large heat storage capacity. Consequently, there always is a time-lag between a change in the fuel input and its effect on the temperature of the steel being heated. This condition has been partially corrected in modern reheating furnaces incorporating a heating zone for heating and a soaking zone for the equalization of temperature. Nevertheless, temperatures are difficult to control when the mill schedule requires numerous roll changes which interrupt the regularity of the operating cycle.

By A. C. CUMMINS

General Superintendent
Carnegie-Illinois Steel Corp.
Youngstown, O.

3. Reheating furnaces are further restricted by their lack of ability to heat different grades of steel at the same time.

Several attempts have been made to control temperature of the steel by automatically varying the fuel input to the reheating furnace by the use of radiation pyrometers, selenium cells, or thermocouples.

It has been found that time-lag hinders the radiation pyrometer, that smoke and dust in the furnace atmosphere affects the accuracy of the selenium cell, and that thermocouples measure the temperature of the products of combustion rather than that of the steel being heated. However, thermocouples in the furnace roof seem to provide the most accurate primary control device of the three.

A modern 3-zone reheating furnace equipped with roof thermocouples controls the temperature of the heated steel with about 100 degrees Fahr. maximum variation from normal. This is approximately one-half the variation experienced when a skillful heater operates the furnace without the assistance of the automatic fuel input control.

It has been suggested that the solution of the constant rolling temperature problem may lie in utilizing the present type of reheating furnace to raise the temperature of the steel to a point 100 or 150 degrees Fahr. less than the rolling temperature, and

employing a supplemental electric furnace, using either the electric resistance or the high-frequency induction principle of heating, to bring the steel to the rolling temperature. Thus a more accurate control of temperature is attainable. If this scheme should prove practical and economically feasible, it would help solve other problems incident to heating, such as the control of scaling and decarburization.

Mill Arrangement

During the course of development of the rolling process, the number of different arrangements of the rolls and roll stands that have been tried is almost infinite. A mill layout which is ideally suited for tolerance control when rolling products of one class usually is not best for rolling products of other classes. Therefore, the selection of a mill layout based on the control of tolerance is a complicated problem and usually should be predicated on obtaining the best combination of:

1. Versatility — maximum product range at reasonable production and investment costs.

2. Rapid rolling—large total production with minimum rolling time for each piece.

3. Rapid roll and pass changes.

4. Sufficient passes to permit proper roll pass design.

5. Ability to roll both large and small "order item" schedules economically.

6. A balance among investment costs, operating costs, and rolling capacity which will minimize the total cost of the product when capital charges are considered.

A number of recent mill designs have been planned for high production, low operating cost, and close tolerance control when producing large tonnages of a given size. Such designs commonly possess an inher-

*From a paper presented before the American Iron & Steel Institute, New York, May 23, 1940.

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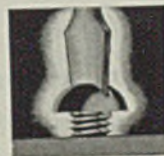


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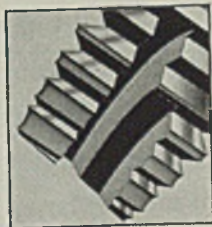


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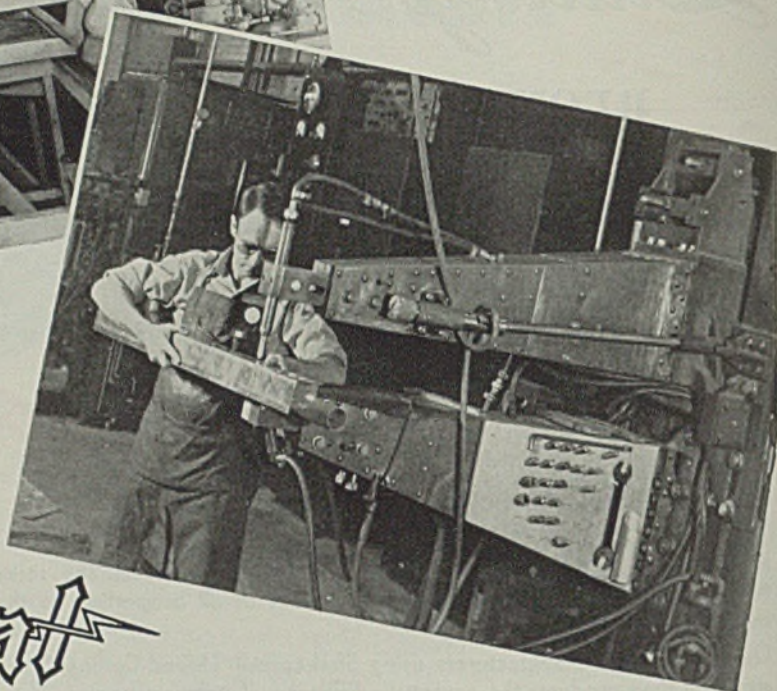
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Always Consider Resistance Welding



(Top)—At the Boeing Aircraft Co., Seattle, Washington, a Federal Spot Welder is used for making long sheets of aluminum alloy by "stitching" smaller sheets together. Finished work is shown on the roll at the left.

(Right)—One of two Federal combination spot and seam welders used by the Lockheed Aircraft Corp., Burbank, California, for assembling secondary structures such as motor cowlings, paneling, doors, etc. The welder shown is built with special 53 inch electrode arms to accommodate extra large sheets of aluminum and stainless steel.



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Welding Machine literature is available. Inquiries given prompt attention.

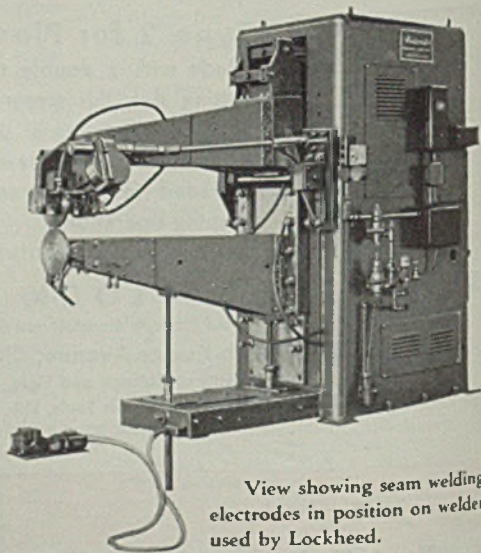
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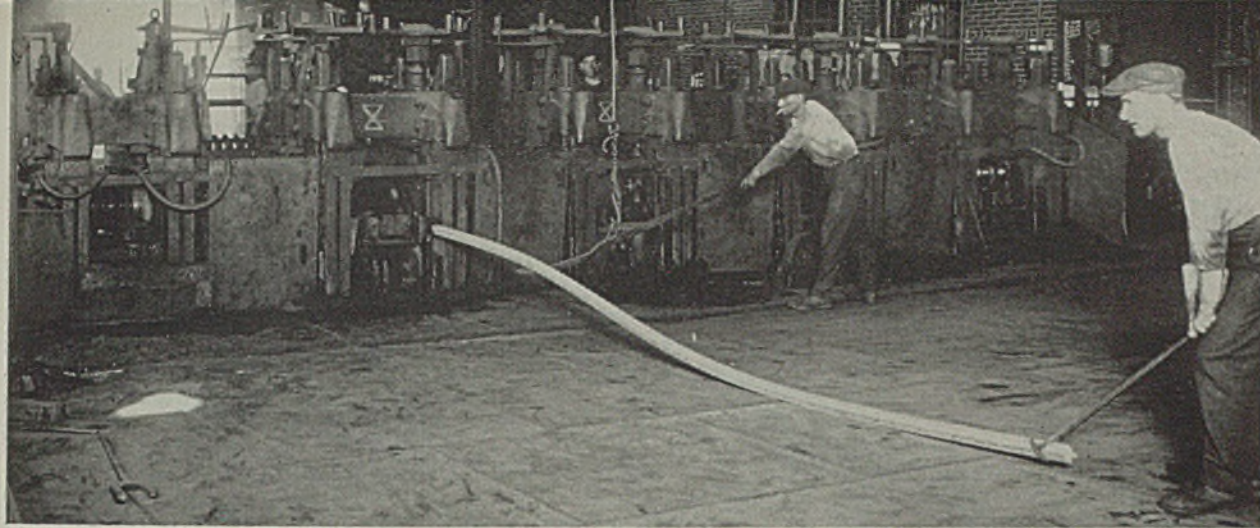
In England, made by British Federal Welder & Machine Co. Ltd., Dudley, England

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View showing seam welding electrodes in position on welder used by Lockheed.



Belgian type mill suitable for the production of small quantity orders

ent weakness: they are not economically adapted for rolling small order schedules from the viewpoint of any one of the three objectives of high output, low cost, and close tolerances. The industry is awaiting a mill which will perform satisfactorily in all three respects, whether the schedule is composed of small or large items.

It is axiomatic that any industry strives continually to secure better equipment for any phase of its process in which wear is a major item of expense or is of importance in controlling quality. While there has been a great improvement in the materials used for the manufacture of rolls, roll life remains a factor in tolerance control; particularly for those products having contours which require rolls having grooved contours. The number of possible redressings is limited; and the deeper the grooves the shorter the life. Consequently, the use obtained from a set of rolls is largely determined by the amount of wear permissible before the sections produced are beyond the tolerance limits. A reduction in tolerance will require more frequent redressing and this means more roll changes as well as a decided reduction in roll life. A question then to be considered is whether the need for reduced tolerance is of sufficient importance to justify the additional roll expense that would ensue.

Conditions Are Different

In the case of plain cylindrical rolls, such as are used in continuous strip mills and plate mills, the problem has a somewhat different aspect. The art of heat treating rolls has so advanced in recent years it can now be said that, except for loss of crown, roll life is not an item of importance in the control of tolerance. Loss of crown is of much less concern to the flat product mill operator than is the wear of roll grooves to the shape or bar mill operator. To the latter, roll wear is a major limitation in the control of tolerance, and the

closer the tolerance the greater the need for roll materials which will supply a longer life.

Bearings

The development of large, anti-friction roll bearings has gone far in helping to solve the problem of tolerance control because it has provided the industry with bearings having almost zero clearance and sufficiently long wearing life to prevent any change in clearance, even after large tonnages have been rolled. It is important that these bearings be operated and changed under conditions of absolute cleanliness otherwise they become a hazard rather than an aid.

Improved bearings of the so-called "oil pressure" type are also available and have been used by the industry. They likewise have small clearances and in general resemble the turbogenerator bearings. Wear is almost zero and they have ample area to resist forces in the thrust direction. They require less space than roller bearings of equivalent capacity, and consequently can be applied where too little room exists for the roller type.

On the smaller units, particularly those of light design, the use of the fabric bearing has done much to relieve difficulties incident to bearing wear. Their use has resulted in a degree of tolerance control which could hardly have been attained with the babbit lined type, except at the expense of heavy inspection rejections.

All of these designs fully meet the conditions by which bearings may influence tolerance control.

It has been suggested that the engineers of the industry should strive to improve the design of rolling mills to counteract the detrimental effects of the small order item on tolerance control. It is the author's opinion that while they are able to do much to help, it will require the effort of the engineer

plus the elimination of the small order item before the ultimate in tolerance control is reached.

The small order item involves changing rolls frequently, and sometimes the items are so small that more time is spent in changing rolls or passes than actually is consumed in the rolling operation. Every shutdown for changing rolls results in a change in temperature of the steel in the reheating furnace. The rolls and all the surrounding machinery in which temperature affects adjustment, change their relationship to each other.

After the set of rolls for a particular section is installed, it is necessary for the roller to adjust the rolls in order to secure the nominal dimensions that are desired. Usually the first piece through the mill does not come within the dimensional tolerance, and sometimes neither does the second piece. In this period time has been lost, the temperature of the steel in the reheating furnace has again changed and the pieces may emerge too hot, or if the heater has anticipated trouble which does not materialize, they may emerge too cold. This, in turn, affects the dimensions of the material as it leaves the finishing stand.

Thus we have a combination of inter-related conditions which result in the production of material much beyond the tolerance limit. Sometimes the order item is for as few as three or four pieces, and as much as 50 per cent of the steel required to fill the order is rolled outside the tolerance limits. This is unacceptable material and must be scrapped before any has been produced within the required range. It can be appreciated that the smaller the spread, the more difficult these problems of control become.

The more frequent the interruptions to the continuity of mill operation because of the small item on the schedule, the more disturbance there is in those factors which affect rolling an exact sec-

(Please turn to Page 77)



Nonferrous Metals Smelter

New plant is constructed completely around materials handling requirements. These determined type and size of the handling system which then dictated structural loads and building layout

■ WHEN Federated Metals division of American Smelting & Refining Co. built its new plant in Chicago, special attention was given to arranging manufacturing operations in a sequence that would minimize handling. The result is an exceptionally efficient handling system that may point the way to lowered handling costs in other plants as well.

The primary raw materials that go into a nonferrous smelter are scrap metals and ore. First operation that takes place thus is the sorting and grading of the scrap. Sometimes sorted scrap is sold just as it is, or it may be pressed into briquettes. That not sold in these forms is stored until it is used to

By H. T. HANSEN

Engineer, Chicago District
Cleveland Tramrail Division
Cleveland Crane & Engineering Co.
Wickliffe, O.

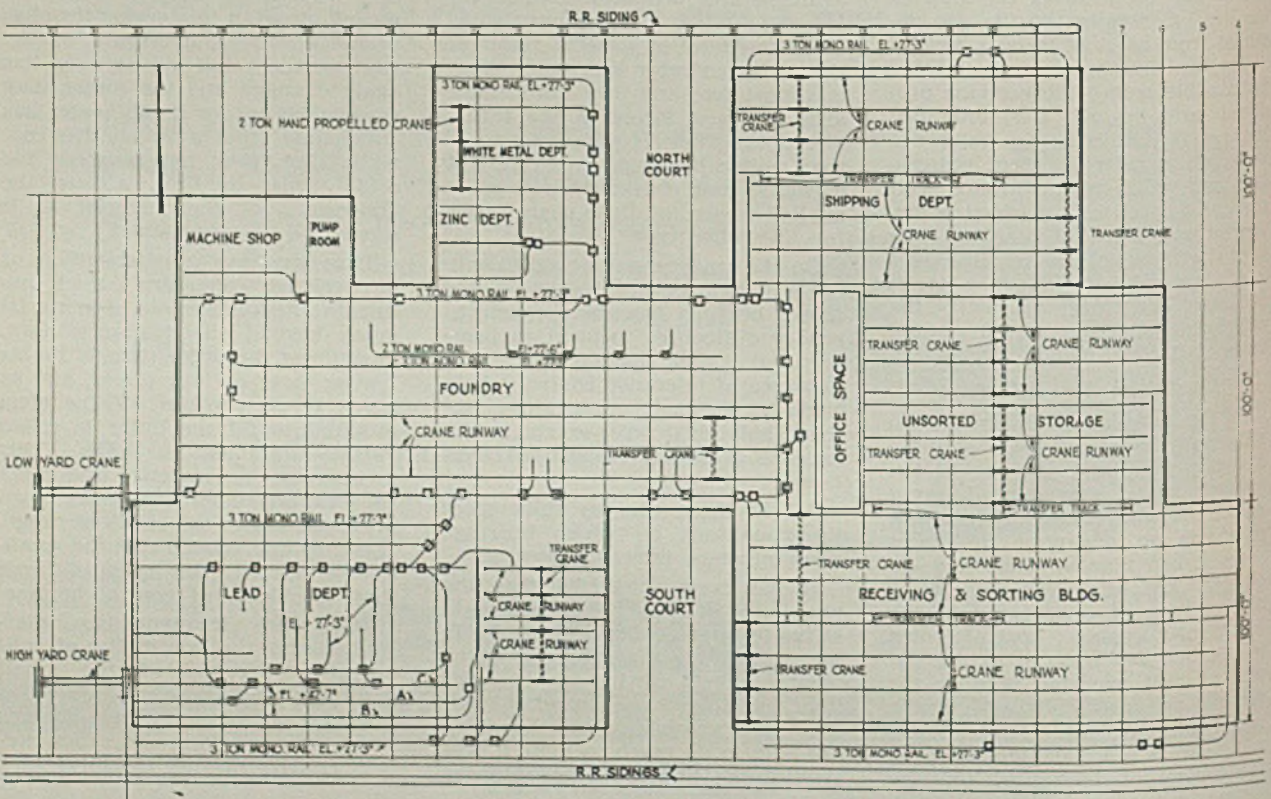
make ingots to buyers' specifications.

It is obvious that a large portion of the production costs arise from handling material into and out of storage. With this important fact in mind, the engineer in charge of the project called in materials-handling engineers long before the

actual planning of the building was started. The conveyor men were given the location of the railroad sidings, the areas required for the various departments, maximum tonnage figures and access to the old plant in Chicago. The best conveying system layout was selected from several that were submitted. At this stage, the plan resembled a flow diagram with the bulk of the handling being done on an overhead tramrail system assisted by power lift trucks on the floor.

Next step was to design a suitable container that could be conveniently handled by both the tramrail carriers and the lift trucks. This developed into a substantial fabricated tote box with a spout

Fig. 1—Layout diagram of Federated Metals plant described here





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nose to permit accurate control in discharging the load, shown in Fig. 5. These tote boxes can be packed almost solid and still be stored six high as in Fig. 4. Next a motor operated grab and a tramrail carrier were designed and wheel loads calculated. Not until then was it possible to design the building.

Flexible Unit Found Best

The Cleveland Tramrail division of Cleveland Crane & Engineering Co. worked together with the architects in designing the building and calculating truss loadings. Figures proved that it would be more economical to use a light tramrail section and hang it flexibly from steel superstructure than to use a rigidly supported rail. A specially rolled, high carbon, high manganese rail section was selected which weighs 6.5 pounds per foot.

It is suspended by alloy steel hanger rods having a tensile strength of 100,000 pounds per square inch. These rods are spaced on 18-inch centers and have a ball at the top end which fits into the socket of the ceiling fitting. They attach to the rail by means of a split clamp which also has a ball and socket connection. Thus the rail is free to swing, saving the steel superstructure and the building steel many a severe shock load. This method of suspension permits use of lighter superstructure and truss members with complete safety.

The plan view layout, Fig. 1, shows the completeness of the tramrail system. Note how the entire

plant is divided into 32 bays, each 20 feet wide and numbered from right to left at top of diagram. The system covers the entire plant from one end to the other and extends into the yard on the west. It consists of three separate tramrail systems operating simultaneously and in co-ordination on three levels. The power lift trucks carry a considerable tonnage, too, and get into the great yard area not covered by the tramrail system.

Receiving and sorting building, Fig. 2, is served by two motor-driven transfer cranes. Note crane carrying a load at center right in this view. Each crane has four trucks, four drive motors and operates on four runways. While each crane usually is controlled from the carrier cab, it also can be operated from the floor. The electric hoist carrier can run from one crane to the other or onto the tramrail track which runs along the railroad dock. These carriers can travel anywhere in the plant on the plus 27½-foot elevation system, permitting them to pick up a load and take it to its destination without rehandling.

Raw materials come into the plant in box cars, open cars and motor trucks. The latter can be driven into the building at the east end. The scrap materials come in all sizes and shapes of containers and bales. It was not possible to design a universal grab that could handle all shapes. As each new

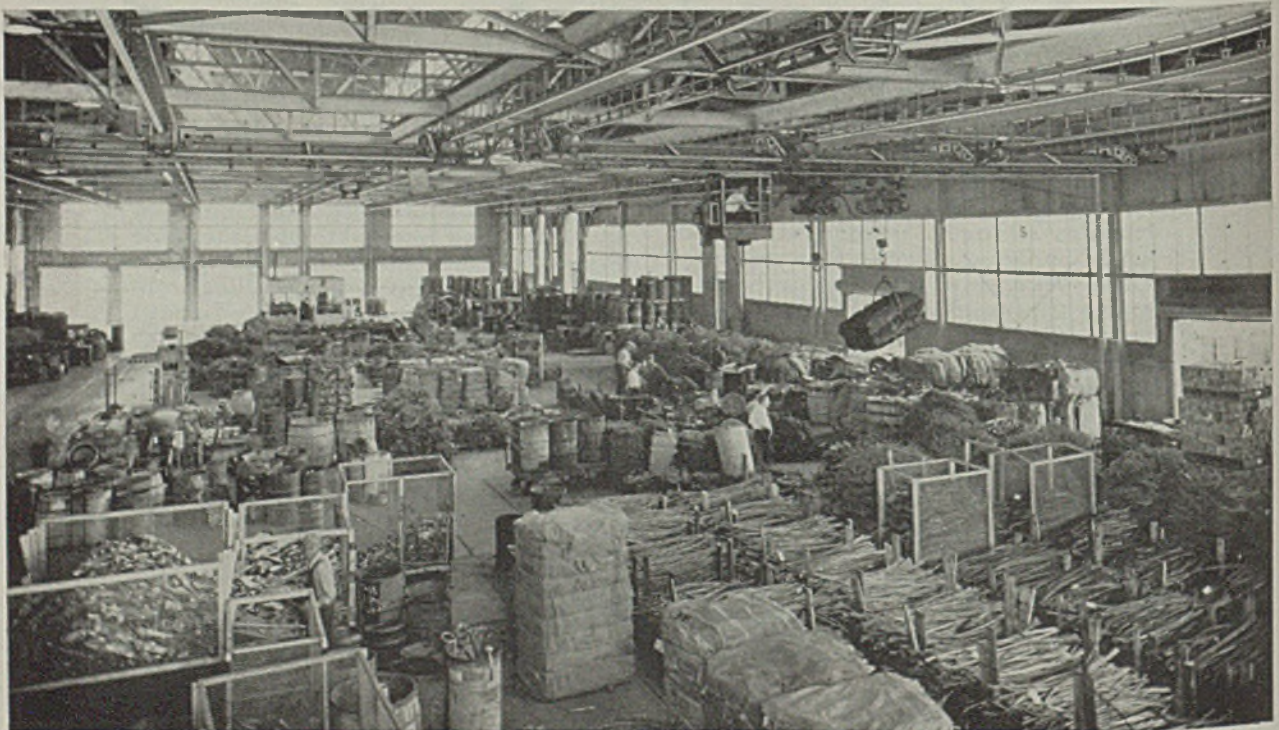
problem presents itself the operating personnel decides what type of hook, sling or grapple is best adapted and has it made in the plant's machine shop.

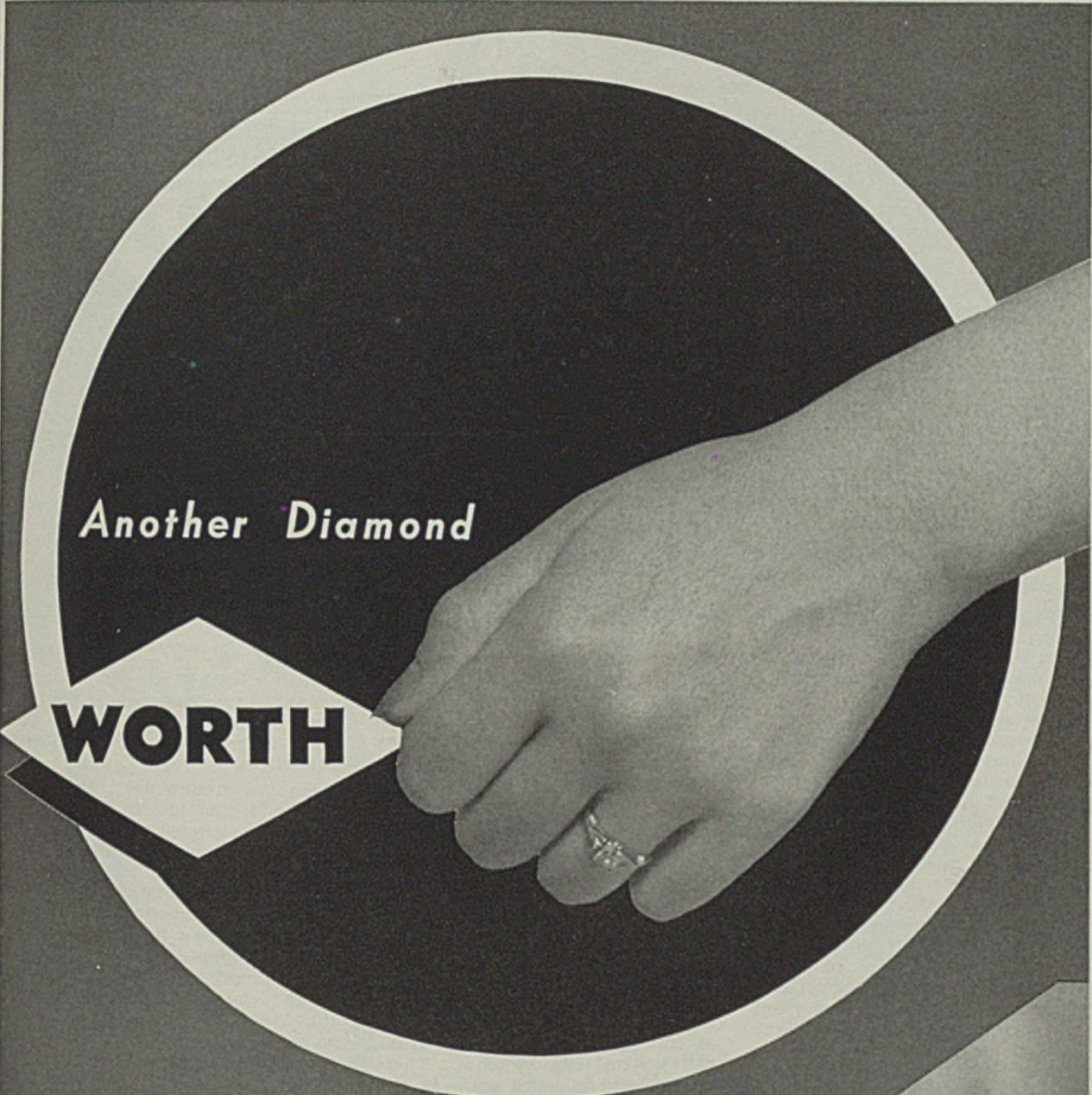
At present, the plant is equipped to handle almost anything. The railroad brings in much loose material which is loaded into tote boxes on the platform and thence into storage by tramrail or lift truck. The lift trucks take empty tote boxes into the box cars. These tote boxes are designed so they will travel on gravity roller conveyors. Hence if the lift trucks are too busy, the tramrail carriers bring out portable sections of roller conveyor which are set up in the box car to bridge the gap between the inside of the box car and the tramrail system and so permit loaded boxes to be delivered by conveyor to a point where the tramrail carriers can pick them up.

All Material Sorted

The materials are given a primary sorting as they are brought in; copper, brass, aluminum, etc., being stored each in its assigned area. Sorting stands are set up beside the storage areas and the metals are sorted into the standard tote boxes or back into the customer's reshippers. Some items such as automobile radiators have pieces of steel attached to them. These are cut off in an alligator shear and the radiators then cut into pieces of convenient size for the briquetting machines. Often sorted metals are sold as briquettes, in which case they are taken direct-

Fig. 2—Receiving and sorting building. Compare this with the shipping department, Fig. 6





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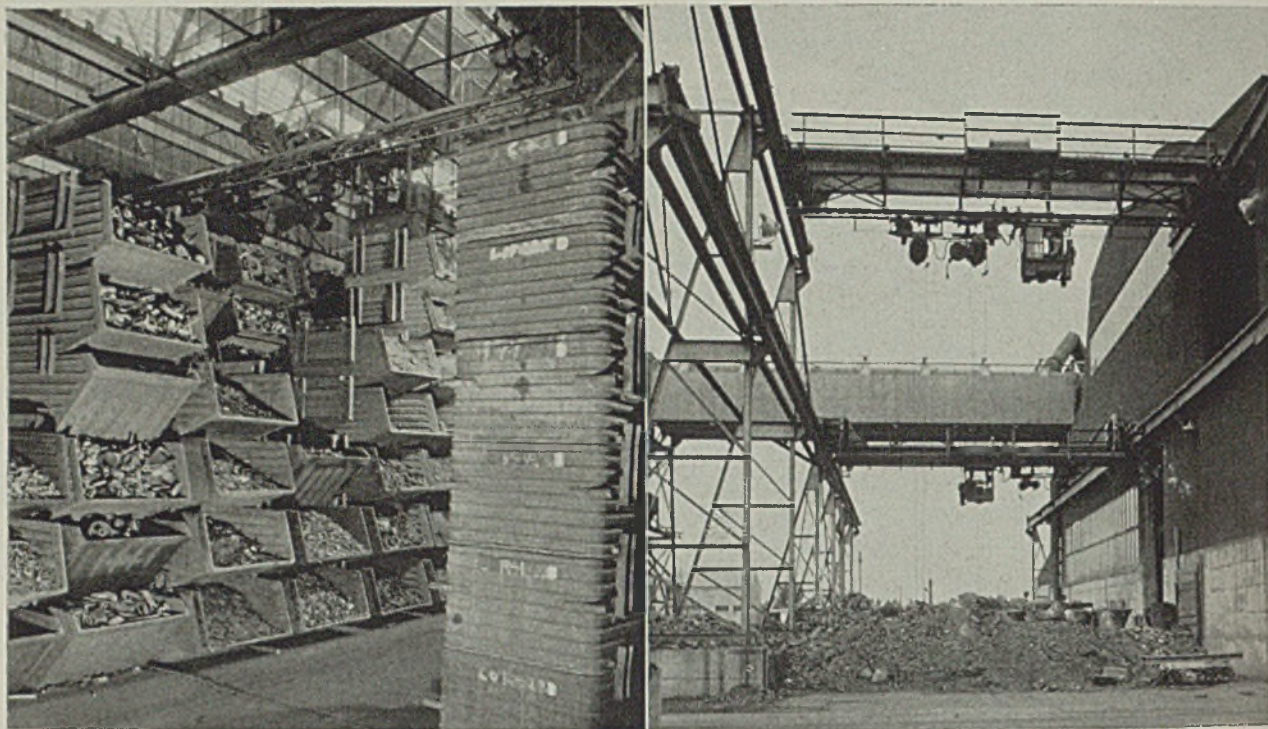


Fig. 3. (Left)—Storage boxes specially designed for efficient handling, and overhead 3-runway transfer crane—all in the foundry area. Fig. 4. (Right)—High and low yard cranes interlock into tramrail lines. These carriers can run directly into the lead department

ly to the shipping department to be stored until released.

Unsorted storage area, see Fig. 1, is not quite so large as the receiving and sorting building. This area also is covered by transfer cranes and single track tramrail. In this building the metals may lie unsorted for long periods. They belong to the customer who is waiting for the demands of the market before having them sorted and processed. Production operations, when finally performed, are the same as in the receiving and sorting department previously described. The unsorted storage department is a flexible unit which absorbs much material and so assists in peak periods. It is a reservoir into which raw materials can be dumped to accommodate the vagaries of the market.

Several Units Serve Foundry

The foundry, Fig. 3, is shown better in the plan view layout, Fig. 1. This huge production area is served by a number of handling units. The 3-runway transfer crane, upper center Fig. 3, brings in sorted metals for accumulative storage. It later charges the furnaces and takes the ingots to the shipping department. The tramrail system, see Fig. 1, almost completely surrounds this transfer crane so traffic is not hampered while the crane is working.

On the north side of the foundry is a tramrail line which feeds a battery of furnaces which in turn discharge into ladles hanging on the 2-ton tramrail system whose elevation is plus 22½ feet. The ladles are conveyed to the ingot molds

on hand-propelled electric-hoist carriers. The ingots are loaded into standard tote boxes under the 3-ton tramrail system and are taken to the shipping department.

White metal and zinc departments' output is not so large because ingots of the more valuable metals are made here. They are taken care of entirely by a single-track tramrail system with switches. There is one hand-propelled crane in this department, which is used only for handling the mixer. The tramrail also is used for handling the pots when they are being serviced.

The lead department, Fig. 1, is interesting and intricate. It has its own truck receiving department on the west side of the south court. It also receives from the railroad siding through the medium of two yard cranes. Huge storage bins are under the high tramrail lines A and B, Fig. 1, elevation plus 42 feet 7 inches. The electric-hoist carrier goes out into the high yard transfer bridge and takes battery plates, ore and other lead materials from the cars and discharges them into the bins. Battery plates, ore and coke are handled with a special clam-shell bucket. The truck receiving department has pits to accommodate the future installation of scales, dumping devices and a roller


conveyer which will automatically place the tote boxes under the high tramrail system. At present this work is being done by the power lift trucks.

On the ground floor, under line C, Fig. 1, and just in front of the bins, is an electric scale car which travels back and forth along the bins and loads the proper ingredients in proper amounts into tote boxes. The electric-hoist carrier on highline C drops its motor-operated grab through a hatch, picks the tote box off the scale car, lifts it to the charging floor and dumps the load directly into the cupola as shown in Fig. 5. The empty tote box then is returned to the scale car. By that time, another full one is waiting and the cycle is repeated. There are two carrier units on the high tramrail system and they are kept very busy as they handle a huge tonnage.

System Also Handles Slag Pots

On the low level tramrail system in the lead department are tramrail carriers to take away tote boxes loaded with ingots and matt. Ladles of hot slag must also be taken out and placed under the yard cranes to cool. In many smelters, these slag pots are wheeled out by hand on 2-wheel buggies.

The high and low yard cranes, Fig. 4, are heavy units because of their comparatively long spans. They are transfer cranes with interlocking mechanisms much the same as the inside cranes. In Fig. 4, the carriers are shown on the cranes. These cranes interlock with



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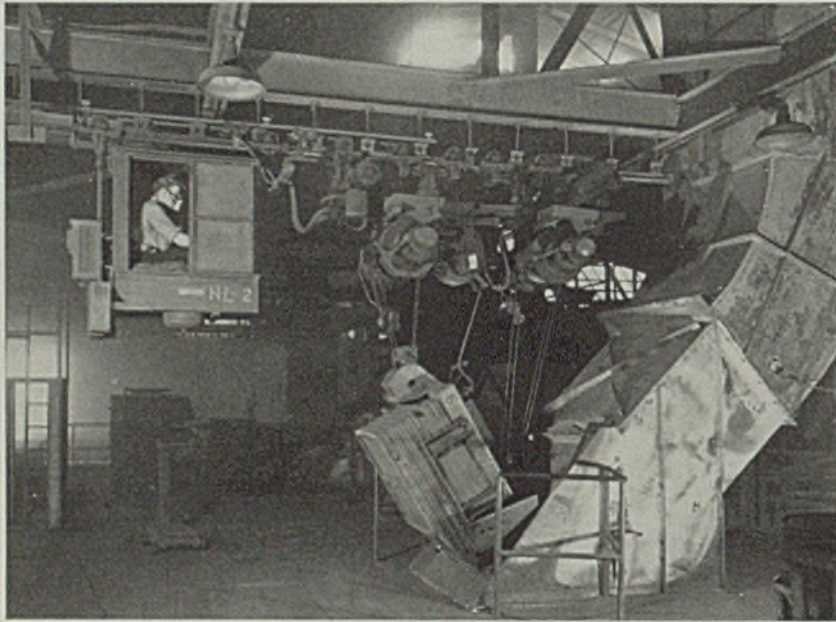
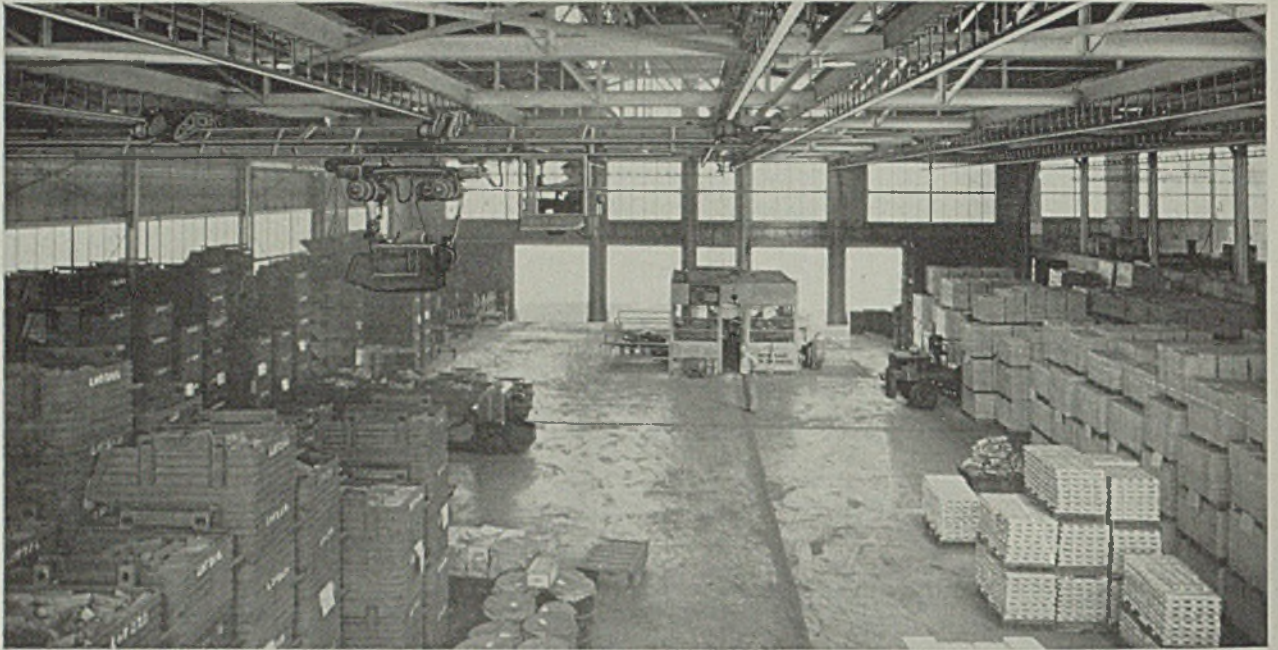
Plate

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tramrails A and B, Fig. 1, so the carriers can run into the lead department. The high crane with its load can pass over the low crane if necessary.

Shipping department, Fig. 6, presents a decided contrast to the hodge-podge appearance of the receiving department, Fig. 2. It is evident much handling must take place between the scrap metal and the ingot. The handling in the shipping department is simple because loose, bulky materials have been reduced to solid ingots and briquettes and are neatly stored in tote boxes and on skids as shown. The few drums in the foreground of Fig. 6 are handled with tongs or slings. The tote boxes can be taken

Fig. 5. (Lower)—Electric hoist carrier and highline C, Fig. 1, serves the charging floor, dumping directly into cupola as shown here. Fig. 6. (Upper)—Shipping room. Note orderly and efficient arrangement

into freight cars and trucks by tramrail and roller conveyer, or by lift truck if they are stored where they can be reached.

This department is taken care of by two transfer cranes and a single tramrail track. One floor-controlled electric-hoist carrier usually stays in the department and is used from stock piles to trucks and cars. Other cab-controlled carriers, see Fig. 6, shuttle in with their loads and out

(Please turn to Page 79)

New Hard Facing Rod For Welding Announced

■ Stody AC, a new hard-facing rod designed especially for alternating current welding machines, is announced by Stody Co., Whittier, Calif. It flows freely under the arc, produces very little spatter and forms a hard, tough, wear-resistant deposit. The electrode is suitable for all types of applications and is available in three sizes $\frac{1}{8}$ x 14, $\frac{5}{32}$ x 14 and $\frac{3}{16}$ x 14 inches.

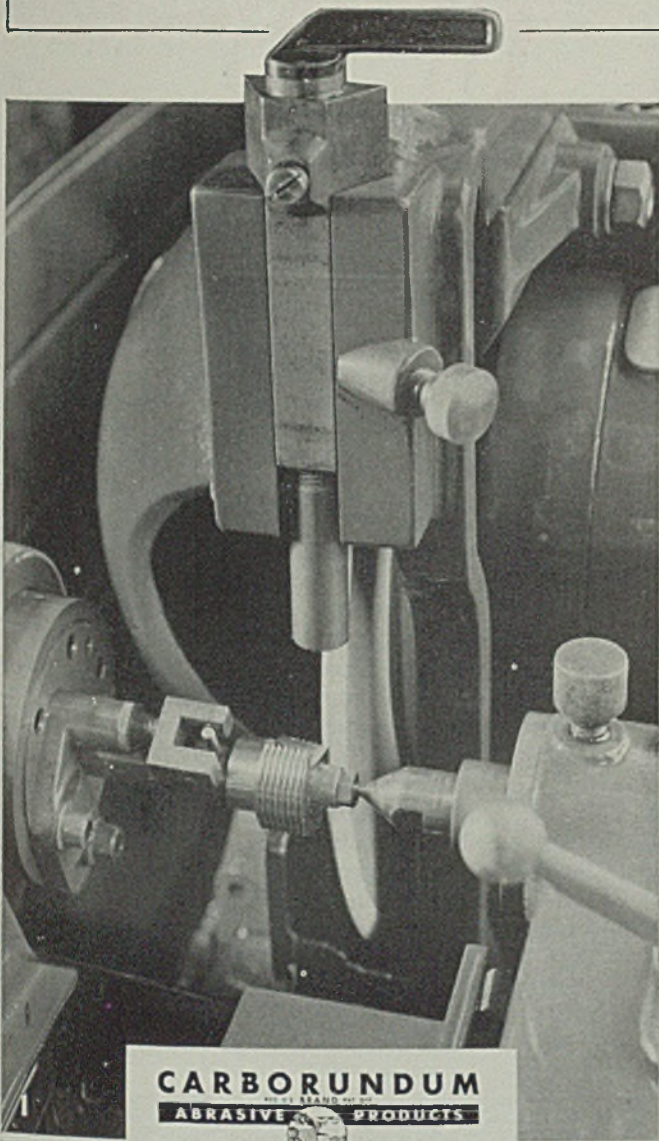
Develops Chromium Armored Pump Bearing

■ The application of electrolytically-deposited chromium over a monel stainless sleeve which has been swedged into a vertical pump shaft has enabled Peerless Pump Co., 1902 East Sixty-seventh street, Los Angeles, to produce a new type of water-lubricated bearing. Thus the pump shaft is armored with heavy chromium over a noncorrosive metal sleeve every 10 feet. These sections of the shaft, in turn, operate within resilient cutless rubber journals, which are fluted and are nonrevolvable.

Heretofore, the use of a chromium surface was not satisfactory, due to its microscopic porosity, its thin wall and its eventual disruption from the carbon steel to which it was bonded.

By the new process, the chromium is deposited to monel to a thickness of approximately 0.003-inch. In pumps placed under accelerated life tests, pumping water heavily laden with sand, the results indicated a shaft life of 27 times that of an ordinary shaft.

NAMCO CIRCULAR THREAD CHASERS ARE GROUND WITH WHEELS BY CARBORUNDUM



● The three photographs on this page tell a story that is important both to *you* and to *us*. Important to us because it is the grinding wheels made by The Carborundum Company that are helping to manufacture the NAMCO circular chaser in the plant of the National Acme Company, Cleveland, Ohio. And important to you because it may point the way to better workmanship, increased efficiency and lower costs in your own plant. Our experienced Abrasive Engineers will be happy to show you how to realize every advantage of the latest grinding techniques. Write or call our nearest office.

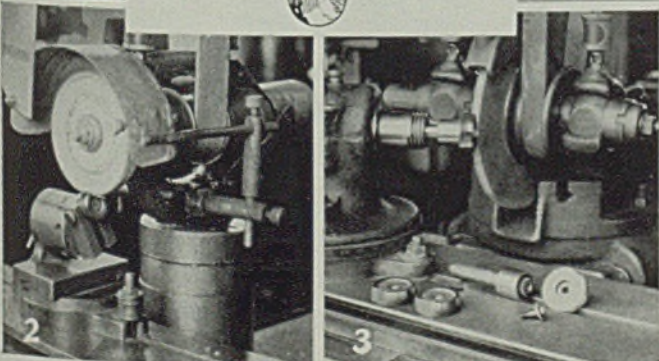
Circular Chasers are difficult to manufacture. They have many surfaces which must be accurately formed as to shape and size. These surfaces must be located in precise relationship to one another. And the finish on all surfaces must be excellent if the chaser is to produce accurate work having a high surface finish, and if it is to give a maximum number of pieces of work between resharpenings. To produce such tools requires the best in machines... plus grinding wheels that hold their form and cut clean and fast.

ANNULAR GROOVES ARE GROUND on a NAMCO circular chaser with an Aloxite Brand Aluminum Oxide "AA" Thread Grinding Wheel in AF4 grit, K grade, 100 Bond. Accuracy in spacing between grooves is held to 0.0002 in. Diameter matches that of other chasers in the set with accuracy of 0.0005 in. All thread elements are equal to gage precision. Illustration No. 1.

RAKE AND FACE ANGLES are ground with the set up shown in illustration No. 2.

THE THROAT (CHAMFER) is ground as shown in illustration No. 3. Both of these operations are also performed with Aloxite Brand Aluminum Oxide "AA" Wheels.

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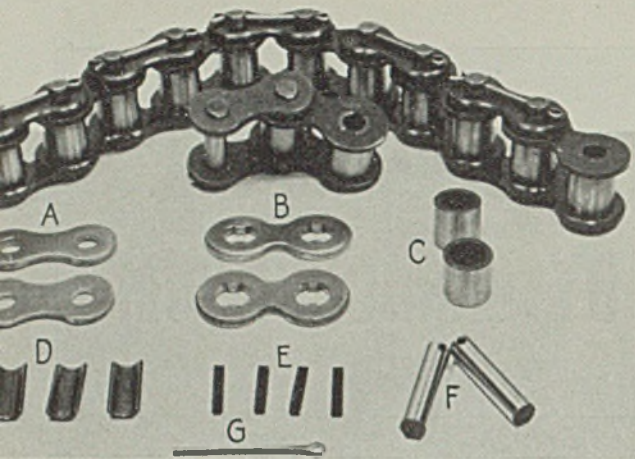


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Roller Chain Manufacture

By FRED B. JACOBS

A number of unusual production machines and assembling setups are developed by a manufacturer of roller chain to facilitate making and assembling the 17 parts that go into each chain link

■ ONE OF the problems presented by the higher speeds and heavier loads to which chain drives are being subjected is that of proper lubrication. Production operations in manufacture of a roller chain developed to permit internal lubrication at The Howe Mfg. Co., 7500 Euclid avenue, Cleveland, involves a number of special machines and setups of rather unusual design. A description of these may suggest improved methods to other manufacturers.

While the Howe chain is interchangeable with any other standard roller chain it obtains improved efficiency by a design which allows an oil film to be maintained continually on pins, rollers and bushings during operation. Each link has 17 components shown in Fig. 1. These are: A outside side bars, B inside side bars, C rollers, D four sections to form two split bushings on which the rollers run, E lubricating felts interposed between the bushing sections, F pins, G cotter pin to lock the link assembly.

Side bars, A and B Fig. 1, are blanked from high-carbon strip steel in a punch press, using ordinary blanking dies. Next the holes are punched automatically. The blanks are piled vertically in a filling sta-

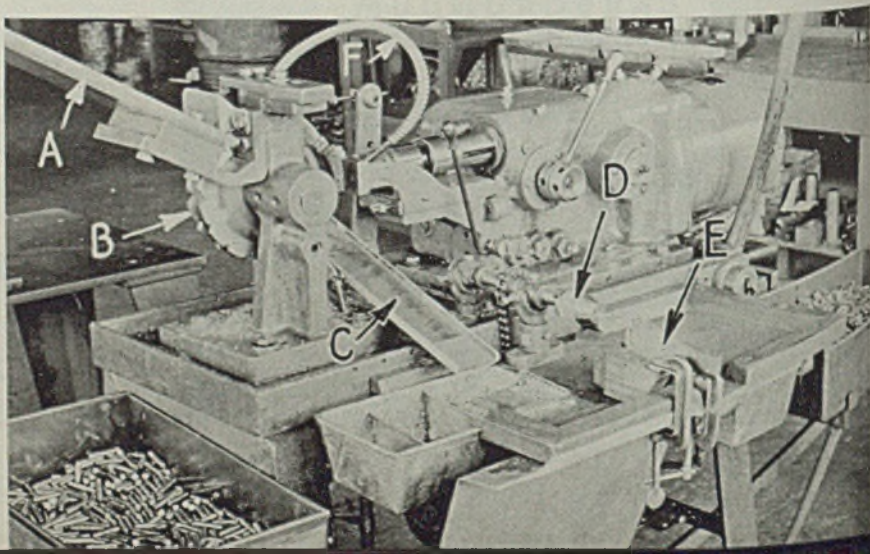
tion. A feed plate takes a blank from bottom of the pile and feeds it to the correct position over the die. When punched, the piece is pushed from the die face automatically as the next blank comes into position. Holes in the inside side bars, B Fig. 1, are punched in two operations. The last is more a shaving than a punching operation and is done to promote accuracy to assure correct pressure when the split bushings are forced in place.

Side bars A and B are chamfered to make the chain run easily and to improve the general appearance. Chamfering is essentially a coining operation, being done in dies, Fig. 2. The operation is practically automatic. The operator merely keeps the filling station full, a feed plate taking a blank from the bottom of the pile and carrying it to position over the die which then descends to force the blank against an anvil. As the die rises, an ejector forces out the coined blank, automatically carrying it away from the die face. A chain drive from the press spindle to a cam shaft actuates the motion. After coining, side bars are rattled to remove burrs, then heat treated.

Rollers made of alloy steel, C Fig. 1, represent an

Fig. 1. (Upper Left)—Length of roller chain and details of components entering into the construction of each link

Fig. 2. (Far Right)—Chain side bars are coined under a punch press fitted with automatic means for feeding and ejecting the parts. Fig. 3. (Immediate Right)—Holes in the chain pins are drilled in an automatic drilling machine. Countersinking is done by hand as the machine operates



ordinary screw-machine job where they are turned, drilled, reamed and then cut off from bar stock. After case hardening they are accurately finished on the outer diameter by centerless grinding.

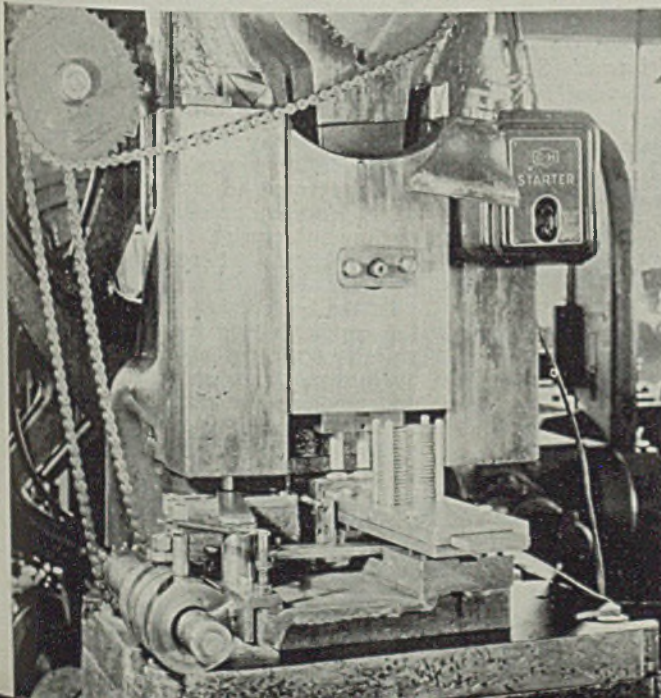
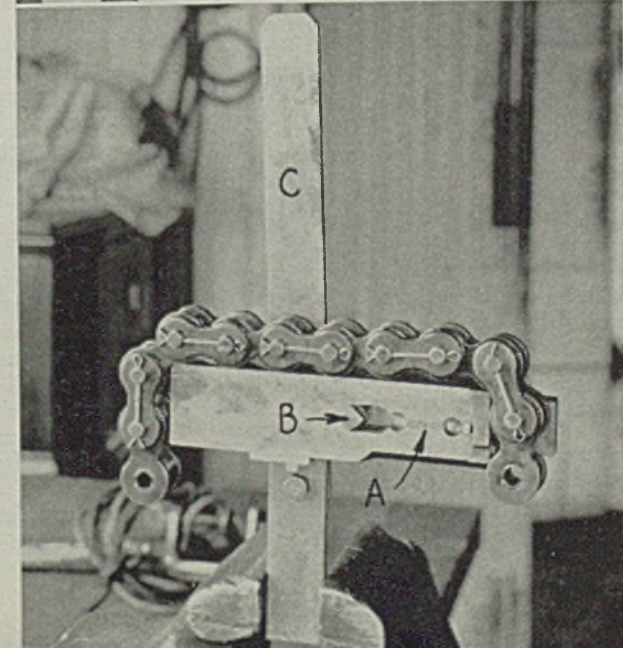
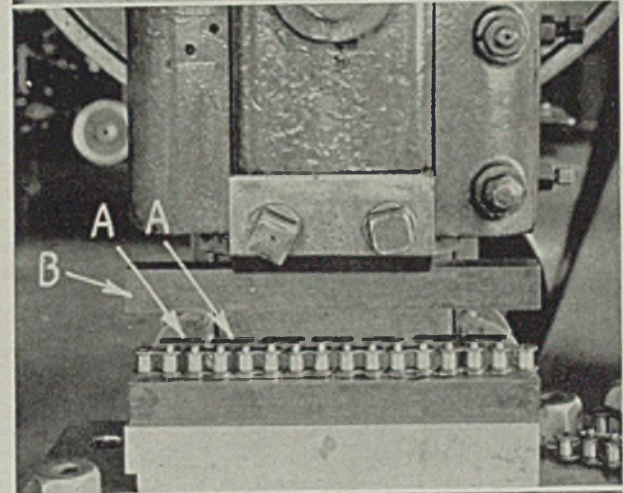
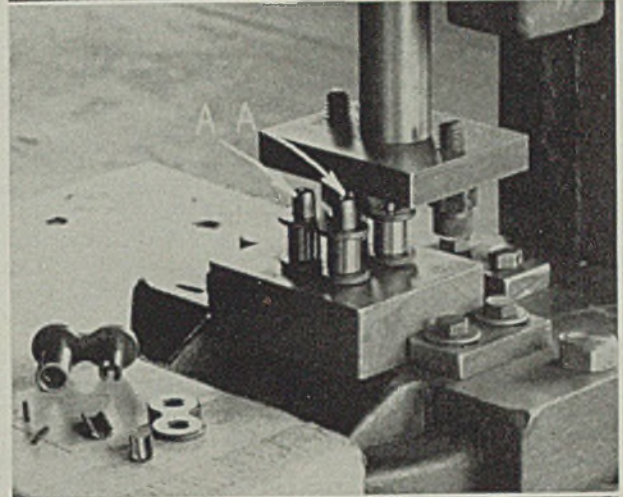
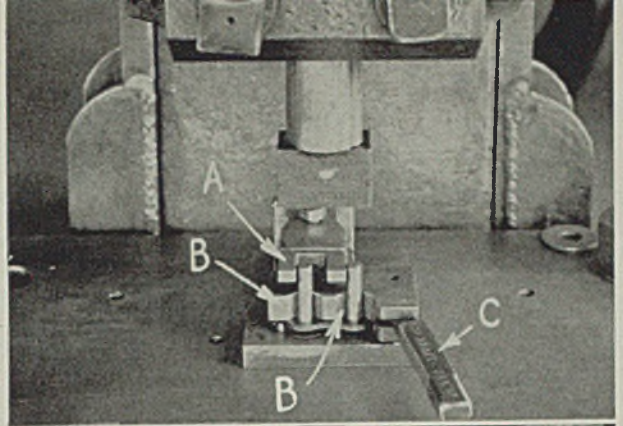
Bushing sections D Fig. 1, must be fabricated carefully as both inner and outer curved surfaces must be true arcs within close limits. The bushing sections are punched from strip stock to the correct lengths, then rough formed and finish formed under dies to curvatures which will make a good running contact with the rollers and pins in the finished chain. These special alloy steel bushings are heat treated. The form of these bushings is held to fine limits as they constitute the bearing for the roller and also the pin.

The felt lubricators, E Fig. 1, are cut from 100 per cent wool felt stock to a size slightly larger than the space into which they are compressed in the assembled links.

Pins, F Fig. 1, are cut from bar stock in a screw machine. Each pin has a hole near one end to accommodate the cotter pin G which locks the link assemblies. These holes are made in a special automatic drilling setup, Fig. 3, designed and built at the Howe plant. The pins slide down the chute A into depressions in the feed wheel B. Each time the feed wheel advances, it stops with a pin directly in front of the drilling station. Drill spindle moves automatically, timed to work while the feed wheel remains stationary. After the hole is made, the drill backs out and the drilled pin drops into the chute C as the feed wheel advances.

The drill at D is used to countersink or burr the
(Please turn to Page 78)

Fig. 4. (Top)—Simple fixture for forcing the pins into the side bars. Lever at the front is left open to show the details. Fig. 5—Bushings are forced into the side bars under a foot press. Power presses are used on the larger assemblies. Fig. 6—Side bars are forced over the pins several at a time in a power press. Fig. 7. (Bottom)—Details of a simple hand-operated fixture for spreading cotter pins



BETWEEN HEATS

WITH *Shorty*



■ Say fellers:

We're havin' a great time at the plant these days when the whistle blows for the noon hour.

A bunch of the boys from the office 'n lab'atory saunters out in the yard where we've laid out a baseball diamond, 'n they pick sides with some of the fellers from the shop. They yell 'n shout and kid with each other 'n as y' look on, y' feel jus' like the boss sez the other day!

"It isn't sech a bad world in which to live after all even tho there are two kinds a coupon clippers—those who nest in Florida for a few weeks of the year, 'n those that are flyin' the oceans."

Well anyway, Tony, the litte "wop" who carries test samples from the bessemer to the lab'atory is becomin' a great rooter. He doesn't understand the game so well but he's gradually gettin' the knack of it.

I saw Tony drillin' some test pieces in the sample room 'n I stopped in ta see how he was comin' along with his baseball. He sez:

"Thosa guys who play 'em what y' call 'em basaball, dey crazy alla time. One a guy he put 'em stick over him shoulder, stand 'em up at houseplate. Man backa him 'fraid alla time."

"Howd ya know?" I interrupted.

"Cause, Shorty, da guy he'sa wear wire fence over his mug alla time 'n he squatta down, lika dis, so he no have far ta drop when da guy wid da stick hit 'em. Righta way queek man y' calla da pitcher he getta mad 'n throw da ball atta guy wid da stick, 'n y' know what?"

"No, what?" I sez.

"Da guy wid da club he give 'em ball for one bigga bump 'n she wassa whizzbang up in da air over da hot metal tracks. I no can believe it you son-of-'em-gun. Da guy he throws da bigga club at da man wid da wire fence over he'sa head 'n den he runs. Pretty soon he steps on a cushion bag but he'sa no sit down. Naw, he'sa loose agin 'n he runs ta 'nother cushion bag. Jus' den da guy who'sa chase

'em ball tries ta hit da runnin' guy, 'n y' knowa somethin' else?"

"Go ahead, Tony," I grinned.

"Da runnin' guy fallsa down 'n make 'em smoke screen so dat y' kin no see 'im. Da son-of-'em-gun he wassa dive fer da cushion bag 'n when da dust clearsa way he get 'em up queek 'n he wassa dust off he'sa workin' pants. His boss yell 'Holdda dat bag' but he no do what his bossa sez; he wassa stand on dat bag 'n alla time da electrician gang yella der head off. Dey mad lika son-of-'em-gun cause da didn't hit da guy standin' on da cushion bag."

"They weren't mad, Tony," I tried to explain, "they were jus' rootin' fer 'im."

"Rootin', huh? Dey were a yellin' alla time 'Getta dat guy onna second. Getta dat guy onna second.' But I guess he'sa no care fer when 'nother guy at houseplate he smack 'em ball da guy on dat cushion bag beginna gallopin' 'n jeeminie whiz, he'sa no stop till he wassa got over da houseplate.

"Da guy wid wire fence over his mug ketchem ball 'n he'sa tryin' ta soak da runnin' feller in he'sa back but he'sa miss 'em, son-of-'em-gun. Den da electrician gang dey be yell agin lika trouble whistle over da blast furnace 'n some one say, 'Well she'sa gettum one run, y' betcha.' Sure she ketchum one run. So what? Jus' da same dey alla cuckoo."

"Why don't you play with the boys sometime, Tony?" I inquired.

"Maybe somatime I wassa play but no gotta crazy right now y' betcha. Taka dat guy dat they call da 'ump.' He'sa alla time lie. One a guy runna to first cushion bag 'n da ump he wassa holler 'Safety first.' Dat's no good. He'sa lie too much. Dey try ta soak 'em runnin' guy wid a ball right on da head but he wassa too queek. Da ball she wassa hit 'em on da foot so he'sa stop runnin' after he'sa got on cushion sack. He'sa foot hu't but he'sa no squawk. Righta way da ump he'sa holler 'Safety first.' What kinda safety first y' calla dat? He'sa make me seek whenna he'sa

say 'Safety first.' Some a day dey keela some one, 'n it'sa notta gonna be Tony, y' betcha."

"Maybe sometime you'll be a real fan?"

"Yeh, maybe, I donna know," he sez with a shrug of his shoulder. 'N puttin' the drillin's from the test piece into a small envelope, he delivered it to the chemical lab 'n then grabbed his tongs 'n headed toward the bessemer fer more samples.

Well fellers, I'd like y' to meet Tony some day when yer comin' to the plant. Stop in sometime around the lunch hour 'n watch the lads play ball. Bring a couple a dictators with y' 'n we'll show 'em a land where frolic 'n laughter still are enthroned even at the heat of the day.

I'll be lookin' fer y'. S'long.

"Shorty" Long

Patent on Iris Shutter Application Granted

■ York Oil Burner Co. Inc., York, Pa., announces that a basic patent for the application of the York-Heat Iris Shutter to its model "N" burner has been granted to E. I. Kraber, director of research for the company. The patent, No. 2205983, was granted in June and covers all improvements recently developed by Mr. Kraber and the York-Heat engineering staff on the application of the shutter to the burner.

Hardinge Bros. Issues Fiftieth Anniversary Book

■ Commemorating the fiftieth anniversary of its founding in a one-room shop in Chicago, Hardinge Bros. Inc., Elmira, N. Y., has published a book entitled "50 Years of Precision."

The company today has a factory with 50,000 square feet of floor space devoted to the manufacture of high-speed, precision tool room and manufacturing lathes and milling machines of relatively small size.

In the book it is pointed out that the company long has been an advocate of the use of small, easy-to-operate machines on work of small and medium size, thus making the larger and more expensive machines available for heavier work for which they primarily were designed. It pioneered the idea of constructing machines with a matched relation, affording interchangeability of collets and attachments.

Maintenance

MUST BE Maintained



REGARDLESS of what your plans for construction or alteration may be, maintenance in your present plant must go on.

Interruption of maintenance for new construction purposes may impose a penalty on production far more costly than it is worth.

Arthur G. McKee & Company are prepared to handle your construction program, large or small, entirely within their own organization without distract-

tion to your own staff. Under the McKee Method of Undivided Responsibility your in-

terests are protected by a *single lump sum contract* which gives you all construction details and costs in advance.

33 years of world-wide experience in the iron and steel industry have given the McKee organization the ability to carry out your construction program efficiently and economically without interruption of your present operations.

Undivided Responsibility in One Organization



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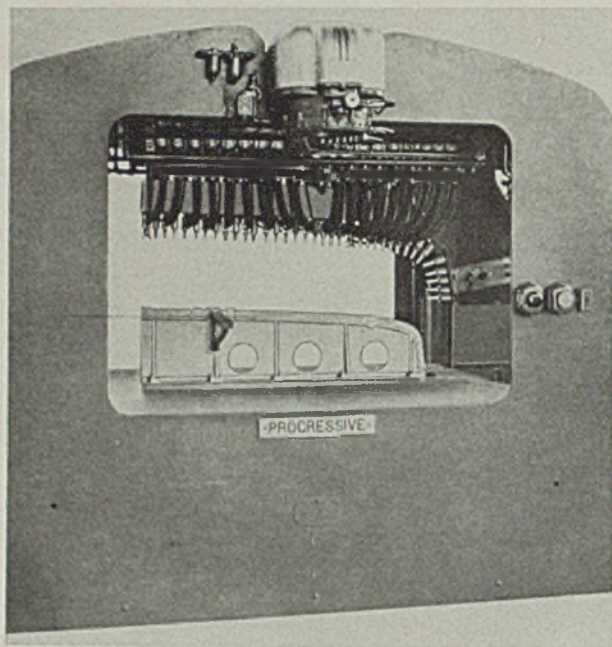


Engineers and Contractors



2422 EUCLID AVENUE • CLEVELAND, OHIO

30 ROCKEFELLER PLAZA, NEW YORK, N. Y. • BUSH HOUSE, ALDWYCH, LONDON, W. C. 2, ENGLAND



This welding machine employs a new timing method with timer and all accessories enclosed in large housing shown, thus machine is self-contained

6000 Welds Per Hour

New timing method permits current application up to 24 cycles in multiple spot welding, allows close control of welding pressure and so gives quality welds at speeds up to 100 welds per minute

■ RECENTLY an interesting method was developed for high-speed spot welding of 1941 model automobile bodies. The machine illustrated makes 36 spots to join the two halves of two sizes of automobile hood tops.

The key to the extremely high speeds—as many as 6000 spot welds per hour—lies in an entirely new method of current transfer which makes and breaks the secondary as well as the primary circuit to give the machine such flexibility of operation that it can weld an assembly having several thicknesses of metal.

Welds of even better quality than in previous machines operating at lower speeds is obtained because in the new method, all welding electrode points or contacts are brought down on the work under full pressure and held there throughout the entire welding cycle. Since the electrode points thus are already on the work before the current is applied and remain there after the current is shut off, the chance of burned welds is virtually eliminated. The longer cooling time while pressure is being maintained on the

weld between the contacts further assists in obtaining improved weld characteristics.

The illustration shows a machine built by Progressive Welder Co., 350 East Outer drive, Detroit, embodying these new principles. It is provided with quickly interchangeable lower electrodes to accommodate different size assemblies to join together the halves of two sizes of automobile hood tops. In operation each hood top half is loaded into the machine—from front and back respectively. Operator then touches a control button to raise the work to welding position, accomplished by four air cylinders. At the end of their stroke, an automatic valve is tripped and additional air cylinders superimpose a “wedging” support for the central portion of the work table, thus effectively bringing all welding contact points up to the desired pressure.

Welding cycle then proceeds automatically. When completed, the table returns to open position and the work is unloaded through one end of the machine.

This method of high-speed spot welding permits such rapid distri-

bution or timing of the current that only one transformer is required for a setup such as described.

The special built-in timing mechanism is the heart of the machine. A $\frac{1}{4}$ -horsepower air motor drives an indexing disk which has a single port near its edge. Gears synchronize the operation of this disk with two automotive type distributors. When the port in the disk comes into alignment with a similar port in the timing chamber, it permits a charge of air under pressure to close one of the contacting guns. This gun contactor then completes a secondary connection between the welding transformer and the work.

Welding current circuit is arranged so the current flows down through one gun to the lower electrode, across to lower electrode at a second point and up through another gun—making two welds in series simultaneously. All 36 welds are thus made in pairs in rapid sequence during one complete revolution of the timing disk. Following the last weld, the machine automatically returns the tables to normal loading position so the operator can remove

(Please turn to Page 79)

METAL SHOW ISSUE

OCTOBER 14, 1940

featuring

NATIONAL METAL EXPOSITION

CLEVELAND, OCTOBER 21-25, 1940

The editorial material and the advertisements in this issue will give you an up to the minute picture of what's new and unusual in methods, materials, metals and equipment.

Write for complete information if you are interested in the advertising possibilities.

STEEL

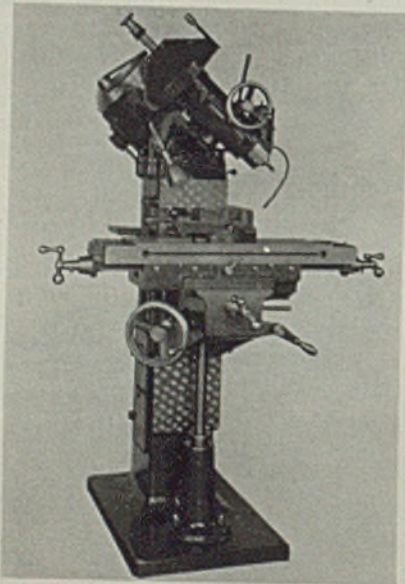
PENTON BUILDING . CLEVELAND





Milling Machine

■ Midway Machine Co., 2324 University avenue, St. Paul, has introduced a No. 2½ Millmaster vertical milling machine which may be used as a production unit in connection with metal, woodworking and plastics fabrication. It has an overall height of 72 inches and a 10½-inch throat length adjustable to any length desired. The 9 x 34-inch table features a vertical feed of 30 inches, longitudinal feed of 18 inches and transverse feed of 10 inches. The spindle is machined for No. 9 B & S taper. The quill has a 5½-inch vertical travel and is equipped with a fast lever feed and slow worm-drive with hand wheel. The machine is driven through a V-belt, the V-pulleys being of the 6-step type. All lead screws have graduated collars for micrometer adjustment of feed and hand-lock levers. Using only half power, the machine will handle a ¼-

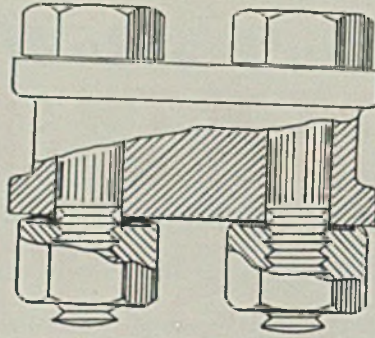


inch cut, ¼-inch deep in solid steel at one cutting while at full speed and full feed, with no perceptible slowing of the spindle. Lubrication is provided by oil-feed reservoir cups at all bearing surfaces.

Although the machine is powered by a 1-horsepower 1100 revolutions per minute 220 to 440-volt motor, it is available with motors in other sizes or capacities. The unit, in the standard model, is furnished with a stationary quill, however, the illustrated deluxe model features a movable quill having a swivel of 180 degrees. The use of the third or center pulley as shown here increases speed range and does not interfere with either swivelling or extending of the spindle head. The machine is very adaptable to die-sinking and metal-routing operations.

Lock Nut

■ An-cor-lox division, Laminated Shim Co. Inc., Glenbrook, Conn., announces a self-contained, one-piece metal lock nut adaptable for builders of machinery. Known as the An-cor-lox, it utilizes a new lock-



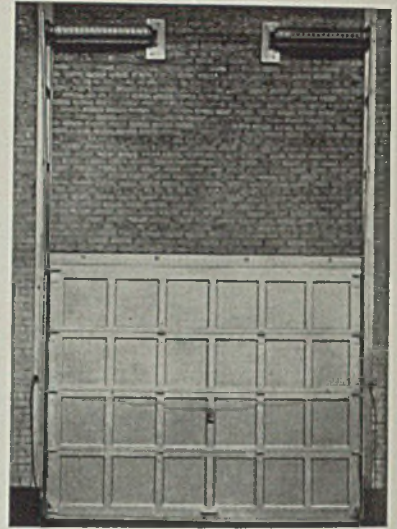
ing principle that permits effective locking of the nut to the bolt. The metal locking ring contained in the bottom of the nut is expanded by the locking pressure into the root of the bolt thread and against the nut rim. No special length of bolt is required as this unit is adapted even to short bolts.

Overhead Door

■ Barber-Colman Co., Rockford, Ill., announces an improved overhead door for commercial and industrial installations. Known as the Barcol OVERdoor it features weathertight closing action. Several other features serve to reduce operating friction. The cable winding drums run on antifriction roller bearings. The connections between the winding drums and the bottom corners of the door are flexible steel airplane cables, and they run direct, requiring no sheaves.

The door sections are carried in the track on antifriction ball bearing rollers. A special closing action forces the door snugly against the stop strips, but only in the last few inches of its downward travel. At other times there is a clearance

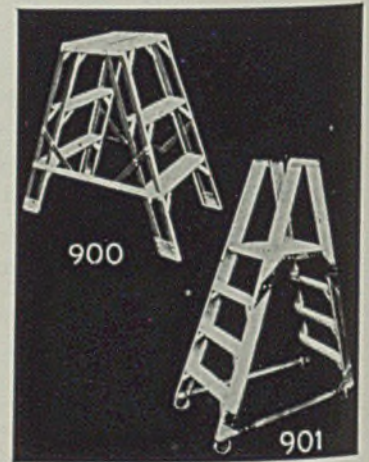
of ½-inch maintained so that if the wood parts swell, there will be no sticking or dragging while the door



is being opened or closed. Twin torsion springs counter-balance the weight of the door at every point of its movement.

Aluminum Ladders

■ Aluminum Ladder Co., Tarentum, Pa., has placed on the market two new double or A type aluminum ladders for use where two persons must use the ladder at the same time, and where ladders must be used in very narrow hallways and aisles. Steps are incorporated on both sides. Both ladders, constructed of aluminum alloy, have a tensile strength of 48,000 pounds per square inch. The ladder, designated as No. 900, is 36 inches high, has



a platform 12 x 15 inches, yet weighs only 13 pounds. The feet are fitted with rubber pads for protection of hard wood and marble floors.

The platform of ladder No. 901, constructed of treadplate for protection against slipping, is 19½ x 22

inches by 4 feet. It includes side rails rising 21 inches above the platform. Ladder itself is 25 x 41 inches overall and weighs 40 pounds.

Electric Saw

■ Skillsaw Inc., 3313 Elston avenue, Chicago, announces an improved model sixty-seven 6-inch electric saw for heavy-duty service. It is compact and ideal for all intermittent maintenance sawing except flooring work. It also may be used with abrasive disks for scoring tile, concrete, etc., and for tuck-pointing. It cuts to a depth of 1 7/8 inches and will rip and cross-cut hard wood up to 1 inch; cross-cut dressed pine lumber up to 2 inches; bevel cut lumber 13/16 inches thick at 45 degrees. The blade has a speed of 3400 revolutions per minute and is protected by an automatic telescopic guard that rotates. The base is adjusted easily for depth and bevel cutting. The model is 15 1/2 inches long and weighs only 11 1/2 pounds, selling for \$75.

Cooling Fan

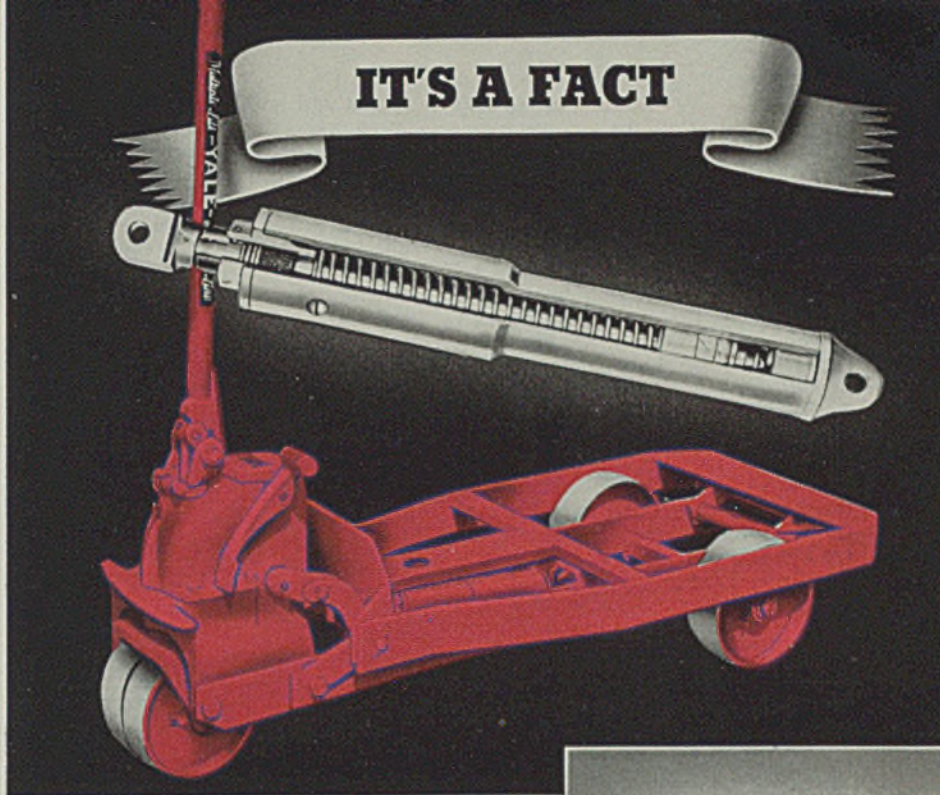
■ Chelsea Fan & Blower Co. Inc., 370 West Fifteenth street, New York, announces a new cooling fan, Wind-O-Fan Jr., for offices, etc., which will fit in windows ranging in width from 26 to 32 inches. It is capable of delivering 3000 cubic feet of air per minute, the 19-inch blade being operated by 1/6-horsepower, 1750 revolutions per minute belt-driven motor. Unit is finished in ivory, its overall dimensions being 20 9/16 x 26 x 12 1/2 inches. Weight is 90 pounds.

Acetylene Generators

■ Marquette Mfg. Co., 409 Johnson street, N. E., Minneapolis, has placed on the market four new portable acetylene generators, ranging in carbide capacity from 12 to 50 pounds. They are small in size and easily moved. Model 512 is simple to operate and has a 12 pound carbide, 12 gallon water capacity, stands 40 inches high, weighs 95 pounds and produces 24 cubic feet of gas per hour. Model 515 holds 16 pounds of carbide, 17 gallons of water, is 50 inches high, weighs 96 pounds and delivers a maximum of 30 cubic feet of gas per hour. Number 530 has a capacity of 30 pounds of carbide and 33 gallons of water, is 61 inches high, weighs 123 pounds and produces 60 cubic feet of gas per hour.

The largest model, 550, holds 50 pounds of carbide and 55 gallons of water, stands 69 inches high, weighs

August 19, 1940



IT WILL PAY YOU TO CHECK UP ON THIS LATEST HAND LIFT TRUCK

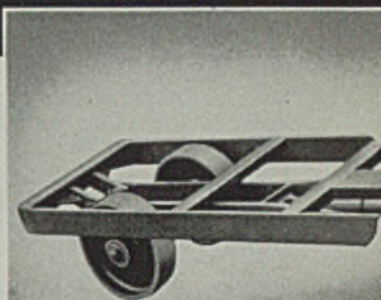
..and here's why

The new *Transliftor*, universal lift, multi-stroke, heavy duty, hand lift truck, incorporates into its design the findings of years of research directed toward better construction and more efficient operation. It will carry heavier loads* at less cost and with less effort. Note these *Transliftor* advances:—

1. **Hydraulic release check** ... never drops a load. Its cushioning action gradually lowers the load, safeguarding it, the truck, operator and floor.
2. **Telescopic bar frame** ... gives greater floor clearance. Platform rails are located outside the frame rails for better support.
3. **Selective lift** ... This lift has a pump action moving in an oil bath for easier operation, and permits either full strokes for quick lifts, or short strokes for heavy loads.
4. **Torsion-type rear link** ... provides greater stability to the load, acts as a side sway eliminator and reduces wear.

Your Yale representative (he's listed in your classified telephone directory) will be glad to tell you of other *Transliftor* features. Ask him about the universal lift, replaceable bearings, free handle control, and machine faced roller bearing steel wheels. Or write to us direct.

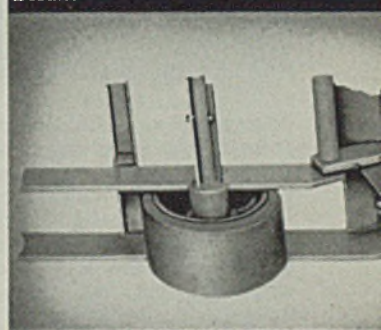
* Capacities 3,500 to 5,000 lbs.



TELESCOPIC BAR FRAME



SELECTIVE LIFT MECHANISM



TORSION-TYPE REAR LINK

THE YALE & TOWNE MFG. CO.

PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.

IN CANADA: ST. CATHARINES, ONT.



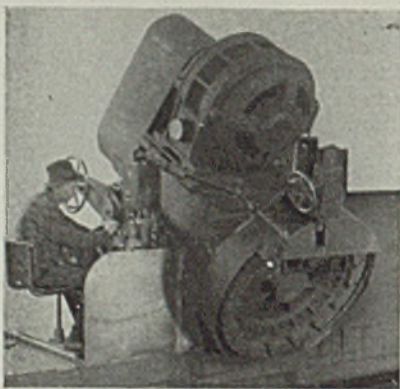
Makers of Yale Hand Chain Hoists, Electric Hoists, Electric Industrial Trucks, Hand Lift Trucks and Skid Platforms.

177 pounds and delivers up to 100 cubic feet of acetylene gas per hour. Operation of these units is automatic once operation is begun. The last three mentioned models will supply sufficient gas for any type or make of oxyacetylene welding or cutting torch. Gas pressure can be regulated or set for a predetermined pressure by the small adjustment screw.

Carbide filler hole is located at top of carbide hopper. The large opening at the top of the generator shell permits thorough inspection, flushing and painting. The generators are also equipped with an interlocking safety bar. A water seal tank on the side of the generator washes the acetylene and acts as a hydraulic safety valve in case of back fire.

Traveling Grinder

■ Hanchett Mfg. Co., Big Rapids, Mich., has introduced a No. 700 U.K. traveling wheel grinder for grinding edges of armor plates. It is of the traveling wheel type—the work remains stationary, and the grinding wheel head being mounted on a carriage traverses back and forth near the edge of the plates to be ground. The machine has a capacity for grinding plates up to 20 inches thick by 10 feet wide by 45 feet long. The grinding wheel is of the segmental type, 48 inches in diameter. Each abrasive block has an 8 x 4-inch grinding face. The grinding wheel spindle is 8 inches in diameter mounted on bearings, and is

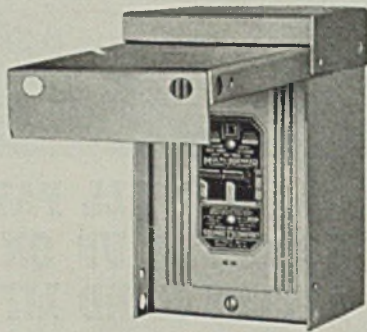


driven through sheaves and V-belts from a 125-horsepower motor. The grinding wheel head has hand, power and automatic cross feeds and can be adjusted from vertical to an angle of 30-degrees. The grinder carriage travels on one V way and one flat way, each 6½ inches wide, by means of a driven bull gear engaging with a rack attached to the machine bed. This feed mechanism is driven through a 15-horsepower reversing motor with controls for providing variable speeds. The ways and rack are pro-

tected with variable belt covers. The ways are lubricated with a forced feed system, including oil reservoir, filter, pressure gage, pump and ¼-horsepower motor. Coolant pump travels along a channel-shaped coolant tank and delivers coolant both on the wheel and on the work during grinding. The operator rides the carriage and has all controls within his reach. The complete machine without work table weighs approximately 75,000 pounds.

Multibreaker Enclosure

■ Square D Co., 6060 Rivard street, Detroit, announces a raintight enclosure for its 25-ampere frame type MO Multi-breaker. It is a galvanized steel hood the cover of

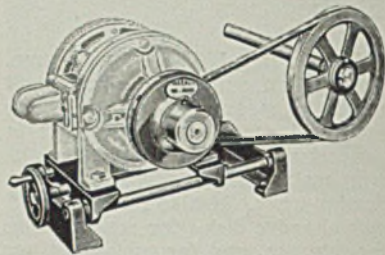


which is removable for easy wiring. Outside dimensions are 7 x 4½ x 3¾ inches with provision provided for padlocking. The raintight hood and the surface type MO Multi-breaker are furnished as separate units.

Variable Speed Control Equipment

■ Reeves Pulley Co., Columbus, Ind., announces the addition of the Vari-Speed Jr. to its line of variable speed control equipment. By its use any standard constant-speed motor from fractional to 1½ horsepower is converted into a variable speed unit without using a special shaft extension. It comprises a disk assembly and adjustable motor base. The former consists of two cone-shaped disks (one stationary and one laterally adjustable), a self-adjusting tension spring, a spring adjusting nut and cover. This is applied directly to the standard shaft extension of the motor and the motor is mounted on an adjustable base. The V-belt, driving between the two disks, and the sheave pulley on the driven shaft, is a standard Section A or B belt. The motor is moved forward and back by means of an adjusting handwheel. When nearest to the driven sheave, the V-belt runs over the largest diameter on the disks and maximum speed is secured. By reversing the

handwheel the motor moves away from the driven sheave, reducing speed. Speed variation is infinite within the limits of the unit and is accomplished while the machine



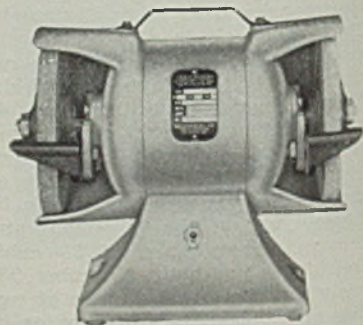
is running without interrupting production. The controller is available in six sizes of disk assembly. Two sizes of motor bases also are available.

Spray Gun

■ Burning Brand Co., 1400 West Fulton street, Chicago, has introduced an all purpose Master Hy-Speed model RF-7 spray gun for product finishing and auto painting. It is balanced and easily adjusted to give efficient results in the application of synthetics, lacquers, water and oil paints, asphalt paints, enamels, and other finishing materials. It operates on from 7 to 15 cubic feet of air per minute, at 20 to 90 pounds air pressure. It features a removable spray head, removable air intake filter, self-aligning airproof spray head assembly, screw cone spray head lock and self-seating air valve. The gun also provides either a round or fan-shaped spray.

Ball Bearing Grinder

■ Baldor Electric Co., 4357 Duncan avenue, St. Louis, announces a new ball bearing grinder with 6 x ¾-inch wheels. It is powered by a capacitor motor which will not burn out when



overloaded. Other features include guards, tool rests and carrying handle. Tool rests are adjustable to and from the wheel. They also may be tilted for angle grinding.

Tolerance Requirements

(Concluded from Page 59)

tion. Strange as it may seem, the section obtained from some of the older mills when rolling the small order item more nearly approaches the theoretical than sections obtained from the most modern mill equipment under similar schedules. Two comparisons may be cited which represent examples actually experienced.

Mills of Different Type

Two plate mills were operating on a similar schedule. One is an old-style 3-high mill; the other a new mill of the continuous type, equipped with modern automatic devices to assure the proper control of rolling and heating. Both mills had scheduled orders requiring three slabs per item.

The tolerance spread was greater on the modern mill than on the old one because to make anything like its normal tonnage, the modern continuous mill must be operated with three slabs in the rolls at one time. Since only three slabs were required for each order item, the drafts must be set by gage or by intuition. There is no opportunity to check the thickness of the product by actual measurement until the three slabs for a particular order item have passed through the finishing stand. On the other hand, in the old 3-high mill the operator gages the plate before the piece goes through the final pass. After the draft required has been determined by actual measurement, the rolls are adjusted and the final pass is given. As a consequence, the plate is rolled closer to ordered thickness on the old type mill than on the modern continuous mill, notwithstanding the fact that there is much greater deflection in the rolls of the older 3-high mill and the heating is less uniform.

On the other hand, if the continuous type mill is given a schedule involving 20 to 25 slabs per item, it can produce plates to much closer tolerances than the older mill. Obviously, then, the larger order should be scheduled on the modern continuous plate mill, the small orders on the older 3-high mills. Such experience brings home the need for providing means to enable the modern mill to roll small order items with less handicap. In the meantime, the tolerance standard must remain that imposed by the small item or the limitations of the older type mill.

Conditions Are Similar

A somewhat similar situation exists in two bar mills. One is of the old Belgian train type, and the other a modern straight-line continuous type. The range of product

sizes on both mills is about equal.

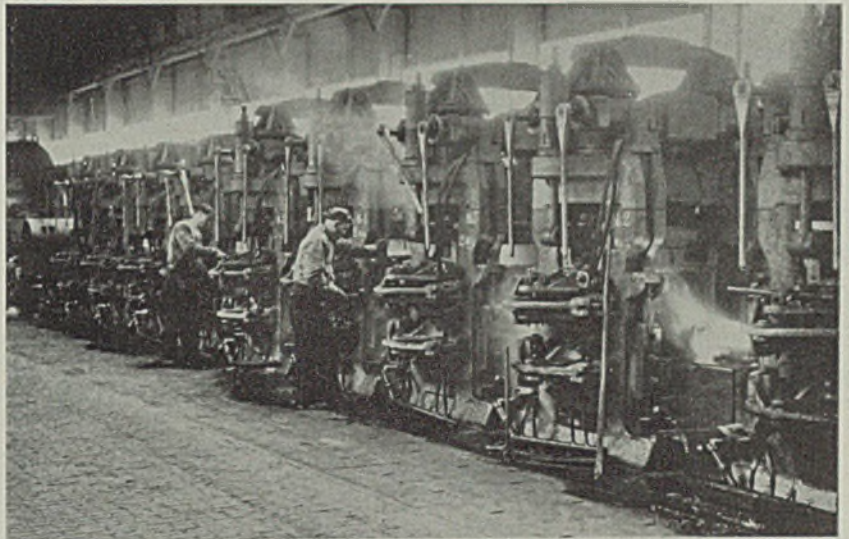
When orders are mainly for small amounts, the loss of material rejected as off-section and the loss of time involved in roll adjustments to secure section causes materially higher costs on the modern continuous mill than when similar orders are produced on the old Belgian style mill. As far as the actual control of size is concerned, the older mill is fully as capable as the modern one of producing material within the present standard tolerance when small order items are scheduled, but the modern mill will produce the same products to closer tolerances at less cost and better yield when the items are 25 tons or greater. This is another example of the need for

nating the nonstandard section is recognized; yet the nonstandard section is a factor limiting the control of tolerance because it tends to increase the number of roll changes.

Conclusions

1. The industry has made definite progress in establishing better standards of tolerance. There is evidence, that present standards are being more closely observed than was the practice with the standards of 30 years ago.

2. Tolerance standards are up to date except in the case of a few products for which the standards are in the course of revision. These standards represent the best practice that can be expected commer-



Continuous type mill designed to produce large quantity orders

designing new bar mills with an eye on the small order problem, as well as the difficulty in controlling tolerances when the small order prevails.

Standard Sections

Another problem, and again one which affects the size of the order, is that of nonstandard sections. At times all that is involved in producing nonstandard sections is to take the allowed tolerance either all under or all over the nominal dimension. Other nonstandard sections may require new grooves in existing roll sets; and still others may be so different from the standard as to require special sets of rolls.

It is obvious that if the nonstandard is eliminated and the orders taken for tonnage for such sections are made orders for standard sections, that tonnage per rolling of the standard section will be increased. The difficulty of elimi-

cially from existing rolling mill equipment, with existing types of business.

3. The small order item is a major obstacle in the control of size variations and the establishment of better tolerance standards.

4. Technical improvements will do much to narrow tolerance limits in the future, provided the problem of the small order item can be solved.

5. Nonstandard sections add to the difficulty of tolerance control, except in cases in which special rolls are provided and order items for those sections are large.

6. The industry has been alive to the desirability of providing products better suited to the need of the subsequent processors. It is reasonable to expect that technical developments in the control of sectional dimensions will permit the establishment of better standards in the future. The co-operation of the user in providing better rolling schedules will shorten the time necessary for the establishment of such improvement.

Chain Manufacture

(Concluded from Page 69)

holes slightly by hand. A slight pressure is exerted by means of the hand-actuated lever E. The operator has plenty of time to burr each hole on both sides while the feed wheel is indexing and the drill is feeding through the pin. During drilling, both drill and work are flooded with oil pumped through the pipe F. A cellophane box prevents oil from splashing yet permits the operator to view the work. This guard, however, does not extend over the countersinking drill.

Pins made of alloy steel are case

hardened to prolong life and to provide maximum strength. However, the undrilled end must be left soft to permit the pin to be headed over during assembly. This is done by suspending the pins on a special rack readily adjustable to correct height and lowering them into a copper plating bath so only the ends are plated to correct length. The copper coat then prevents carbon from penetrating into the pins during case hardening so the pin ends remain soft.

Manufacturing the various components is only half the story because the parts must still be assembled. Several steps are em-

ployed. In Fig. 4, two pins are forced into a side bar. Locating pins in A fit into the little holes previously drilled in the chain pins. V-grooves B also help position the work. After lever C clamps the pins, the descending press ram forces them into the side bar.

To head over the pin ends that protrude through the side bar, the pins are put in another fixture and heading done by a V-shape punch.

Next the split bushings and their lubricating felts are assembled into side bars, a foot press being used for smaller sizes and power presses for larger. The operator takes a side bar and the four members forming the two bushings, puts the felts in place, sets the rolls in position and puts the other side bar in place at top of the assembly. In Fig. 5, the two bushings A slip over the ends of the pins and thus exert direct pressure to force the side bar over the split bushing sections. Pins are put through the holes as guides. One stroke of the press forces the bushing sections in place in both side bars.

Chain Begins To Take Shape

Units, Figs. 4 and 5, now are assembled to complete the chain by forcing side bars over the ends of the pins as shown in Fig. 6. A section of assembled chain is placed on a flat steel block with side bars A placed over the pin ends. As the ram descends, the block B presses the side bars over the pins. Clearance holes correctly spaced in the anvil block allow the pressure to come on the side bars—not on the pin ends.

Final assembly consists of inserting and locking the cotter pins. This is accomplished rapidly by means of the hand-operated fixture, Fig. 7. When the cotter pin is placed in depression A, the spreader B is operated by lever C to open the cotter pin ends as shown in the short length of chain resting on the top of the fixture.

As this chain is sold in a highly competitive market, tests for wearing and running qualities in comparison with other chains are important. For such tests, the company has designed and built a special machine in which two chains are set up to run at the same speed with equal load and equal lubrication to each chain. A run of several hundred hours under this constant tension load readily demonstrates which is the better chain. Amount of wear is ascertained by measuring the amount of stretch or increase in pitch. Some chains whip to quite an extent. Others are noisy in operation or wear rapidly. These tests afford a reliable check on chain performance under actual working conditions, and prove conclusively the importance of proper lubrication.

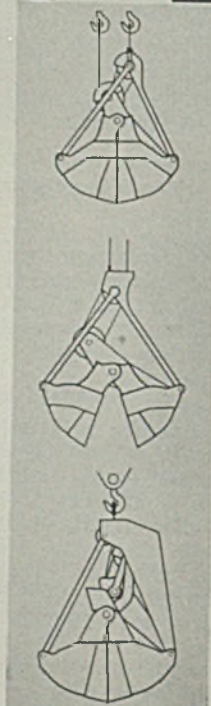


Handling FERROMANGANESE from cars to stock pile this Blaw-Knox Bucket unloads an average of 7 cars per eight hour shift. The former cost of \$.65 per ton was reduced to \$.25 per ton.

This bucket handles LIMESTONE in pieces ranging from 6" to 12" from dock to 50-60 ton gondola, filling car in an average time of 20 minutes.

It unloads SPIEGEL from 50-60 ton car in 1½ hours without teeth, and handles PIG IRON from stock pile at the rate of about ¾ Cu. Yds. per grab.

Blaw-Knox Buckets are designed to meet Steel Mill requirements—put your bucket problems up to Blaw-Knox.



BLAW-KNOX

Digging
and
Rehandling

BUCKETS

BLAW-KNOX DIVISION
OF BLAW-KNOX CO.
Farmers Bank Bldg. · Pittsburgh, Pa.

Nonferrous Smelter

(Concluded from Page 66)

with empty tote boxes.

A tramrail system as long as the one in the plant having about a mile of rail in it must be serviced periodically if it is to function properly. In the machine shop, a spacious platform has been provided from which all parts of the carrier units can readily be reached. Below the platform is a stock room of repair parts which is replenished immediately after a part has been used.

Crane operators were chosen from a group of experienced lift truck drivers with no previous crane experience whatever. In less than six months, however, they have mastered all of the tricks of the crane operator's trade. To them must be given much credit for the outstanding success of this materials handling system.

While this tramrail system is not the largest, it is one of the most complete ever designed by Cleveland Tramrail.

Correction

■ In connection with the article entitled "Greater Production Reduces Costs" which appeared in the Aug. 12 issue, STEEL, p. 69, the next to the last sentence reading "Large increases are anticipated in connection with the current armament program," gave the impression that prices would be increased. The sentence should have read "Large production increases are anticipated in connection with the current armament program." The sentence, as it appeared in last week's issue, contradicted the chart which appeared above it.

6000 Welds Per Hour

(Concluded from Page 72)

the completed assembly and insert another piece of work.

One of the unusual features of this system is the use of air-operated contact guns for the secondary current transfer. Each such gun consists of a cylinder with two split-section pistons. The upper piston is cut diagonally. When air from the timing port enters this chamber, it forces the piston down to establish contact with a busbar from the transformer, completing the secondary circuit. At the same time, it forces the piston to one side due to the diagonal top so the piston makes a positive low-resistance electric contact with the side of the cylinder. The side of the cylinder, of course, is connected to its respective welding electrode point. Connection is broken by a return spring which acts immediately when

the air pressure is relieved.

All welding electrode points can be adjusted to a predetermined pressure by means of a high-pressure spring and a calibrated scale on each gun which permits direct reading of the pressure.

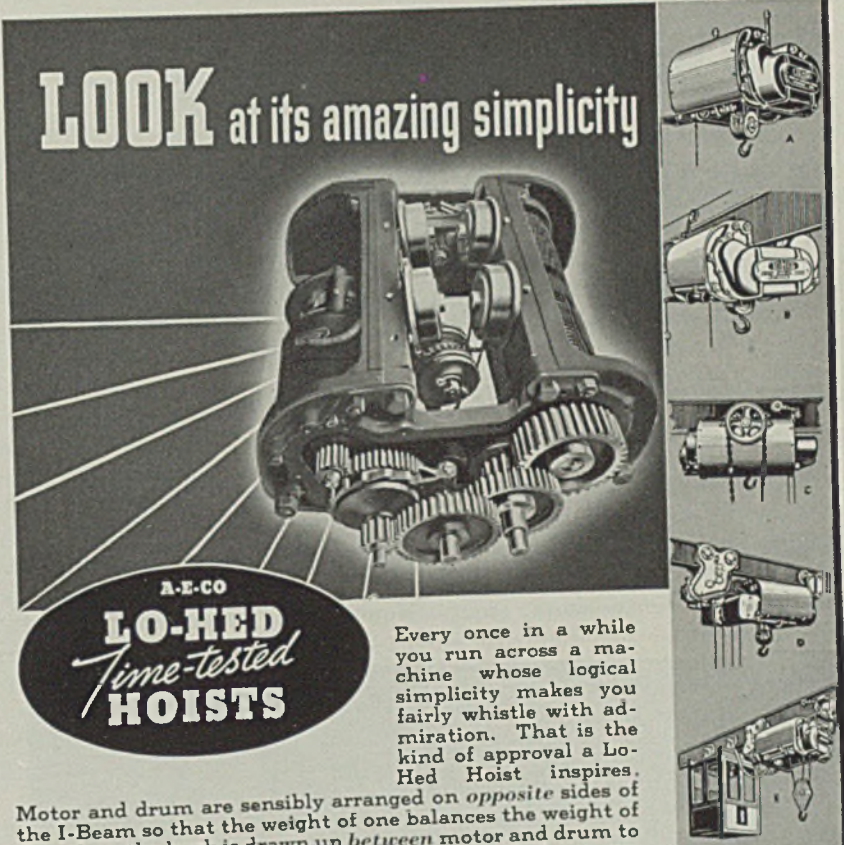
Correct height adjustment for each individual welding electrode is provided in the manner it is mounted in its individual mounting block. This permits work of curved contour or with three-dimension curves to be handled efficiently.

The method of timing welds permits the current to be applied for a

period up to 24 cycles duration at each weld if this is desirable. This long time interval is ample for handling the heaviest high-production work now being welded, it is said.

The method is also easily adapted to use of interrupted welding procedure where the current is applied for short period, cut off, and then reapplied for a second or third period, with all intervals under accurate automatic control. Certain types of extremely heavy-duty welding where interrupted timing is desired thus can be handled.

LOOK at its amazing simplicity



A-E-CO

LO-HED

Time-tested

HOISTS

Every once in a while you run across a machine whose logical simplicity makes you fairly whistle with admiration. That is the kind of approval a Lo-Hed Hoist inspires.

Motor and drum are sensibly arranged on opposite sides of the I-Beam so that the weight of one balances the weight of the other; the hook is drawn up between motor and drum to obtain maximum headroom; and motor and drum are connected by highly efficient spur gearing. Take a look at the open-view of the Lo-Hed and we believe you'll say, "If I'd designed it myself, I couldn't have done better." This unique time-tested construction of the Lo-Hed Hoist gives you low headroom, and an unusually compact, strong, and well-balanced hoist. Remember it also has every worthwhile time-tested feature a hoist needs: Heavy duty hoist type motor, automatic lowering brake, anti-friction bearings, stub tooth spur gears, plow-steel cable, 100% positive automatic upper limit stop, dust and moisture-proof controller. (Construction varies slightly for classes of Lo-Heds.) Investigate Lo-Hed time-tested construction. Write today for the complete Lo-Hed Catalog shown below

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Steel Hardenability

(Concluded from Page 54)

be presented to confirm this lack of relationship, but these may suffice.

An additional test series was run on a bar of "Grainal" treated S.A.E. 1340. As before, hardenability determinations were run by end-quenching from 1500 and 1700 degrees Fahr. after 1 hour at heat, and special tensile test bars were run. Fig. 6 shows the results obtained; hardenability definitely increased as heating effect was increased, but P-value decreased slight-

ly. Tests on samples from another heat acted in similar manner.

The results cited are definitely contrary to what was expected. The writer had presumed that higher hardenability would provide better structural uniformity, and that this would manifest itself in improved mechanical properties. Were this true, superior hardenability in a given analysis and grain size would connote high ductility in the tensile test, and this behavior would in a measure explain the high P-value of "Grainal" treated steels. It must be concluded, then, that there is no

direct relationship between end-quenched hardenability or the facility with which a maximum hardenability is reached, and ductility in the tensile test.

The meager data here presented can only be regarded as conclusive in a negative sense. Nevertheless they are presented, with the thought that by such presentation on the part of many investigators the clear picture of alloy steel hardening behavior will be developed, and that eventually it will be possible to obtain and more efficiently utilize steels of better, more closely controlled hardenability.

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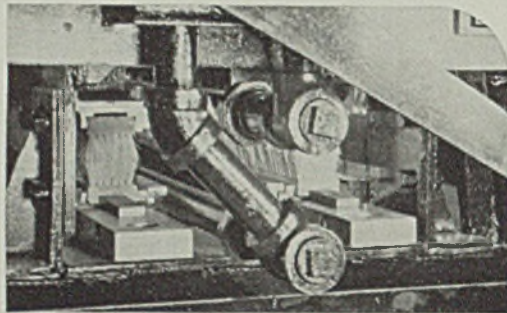
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8. "Mirrors of Motordom," *STEEL*, April 22, 1940, p. 35; "Vanadium Develops New Alloys to Increase Uniformity, Control," *STEEL*, May 20, 1940, p. 38; "Process Alloys for Steelmaking Afford Important Improvements," *STEEL*, July 15, 1940, p. 52.

Issues Tentative Rules For Welding Tanks

■ Now available from the American Welding Society, 33 West Thirty-ninth street, New York, is a small 20-page booklet entitled "Tentative Rules for Field Welding of Storage Tanks." Prepared by a special committee, it covers in nine sections such subjects as materials, qualification of welding procedure and testing of welding operators, design values, joint design, details of welding procedure and tank testing.

The rules outlined in the booklet are intended to apply to the construction of fusion-welded, bulk storage tanks of the above-ground type for holding liquid products at atmospheric pressure, or not over 15 pounds per square inch gage pressure.

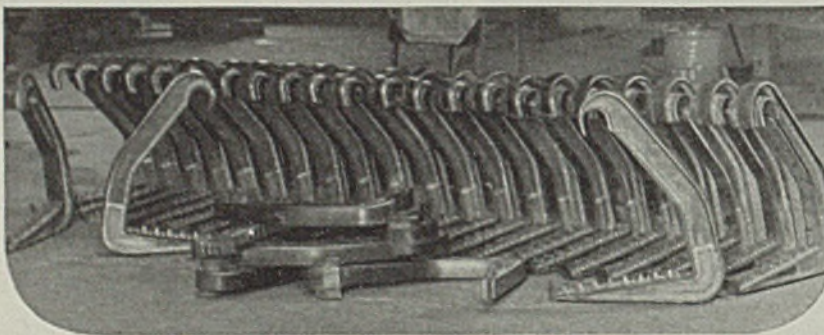
HOOK UP WITH LOWER COSTS!



Ability to stand up against pickling acids and heavy loads gives Monel equipment long life

Spotted just before wind up reels, six of these 48" Broden scrubbing machines, as shown above, scour

The pickling hooks pictured below were produced by the Youngstown Welding and Engineering Co. to carry 800 lb. loads. The upper portion of these hooks are plain steel. Lower portions, subjected to notch stress and acid baths, are long-lived Monel. Years have proved Monel



away every trace of acid and scum in a stainless steel wire mill out in Ohio. This photo also shows removable brushes held firmly in Monel holders. Monel withstands vibration and fatigue strains as easily as it resists corrosives. For longer wear, Broden uses Monel pins in the swinging arms.

provides high resistance to acids and other corrosives. Fabricating easily, Monel works in harmony with other metals.

Your consultation is invited on applications of various types of Monel. Please address:

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MONEL

Active Pace Holds in Steel Demand. Output

Variations in orders having little influence on operations. Delivery problems affecting heavy products

■ VARIATIONS from the recent active pace of steel demand are slight and without influence on ingot production.

A small decline in buying of some products compared with a month ago loses significance in view of heavy backlogs and prospects for rising consumption in various directions the next few weeks. Several districts scored further gains in operations last week, but these were more than offset by a relatively large drop at Pittsburgh, where a vacation shutdown by a leading producer brought the area's average down 6 points to 80 per cent. Net change in national average steelmaking was a $\frac{1}{2}$ -point loss to 90 per cent. A year ago the rate was up $1\frac{1}{2}$ points to $63\frac{1}{2}$ per cent.

Production difficulties vary with different products. Backlogs of sheets and strip are kept in check by the slower buying which followed heavy commitments and shipments in recent past weeks. However, this situation may be reversed as assembly of 1941 automobiles gathers momentum. Tin mills still have large stocks despite heavy consumption, and production in the near future is not expected to move much if any above its recent level of 70 per cent.

Mill schedules are most congested in heavy products. Structural shape deliveries have lengthened steadily, and in some instances engineering contractors have complained of inability to obtain shipping promises. A factor aggravating this situation is that considerable armament material must be rolled on structural mills. The demand-capacity ratio is less acute in plates, although deferred deliveries prevail on certain sizes, a condition also common to bars.

Defense contract awards continue to add tonnage to steel producers' books, but in many cases shipments of the material required will be spread over many months. This is particularly true of ships and tanks and of equipment for which manufacturing facilities must be created or enlarged.

Export markets tend to lag slightly in some products, although heavy shipments continue, particularly to Great Britain and Canada.

Gains in releases of automotive steel reflect the reversal in the recent downward trend of passenger car assemblies. Output last week jumped nearly 9000 units

to 20,475 cars and trucks as several more interests started to turn out new models. A steady upturn is indicated into next quarter. Production a year ago was 15,105 units.

Railroad demand for steel is gaining moderately, influenced by car repairs as well as by a fair volume of new equipment buying. Orders are headed by 1565 freight cars for the Atlantic Coast Line, 100 box cars for the Louisville & Nashville and 190 freight cars and 51 passenger cars for the Southern Pacific. Additional car purchasing is in the tentative stage, although few major inquiries now are active.

Mills are anxious to obtain an estimate of probable rail purchases by the carriers in coming months in order to anticipate rolling problems which may develop between now and next spring as a result of growing defense requirements. For this reason possibility is seen that fall rail buying programs may be advanced.

Fabricated shape and concrete reinforcing bar orders continue numerous, and the large volume of work still being figured assures sustained activity. Among larger pending projects are a Rhode Island naval station involving 11,000 tons of piling and a Delaware bridge taking 6800 tons of shapes. Inland Waterways Corp. has ordered 15 barges requiring 8325 tons of steel.

Pig iron shipments are responding to moderate betterment in foundry schedules, the gain being seasonal to a certain extent. Consumers are not inclined to stock heavily, although future needs, where definitely established, are being anticipated. Absence of inflationary price tendencies in commodities as a whole is an important factor in restraining more extensive forward coverage on iron and steel products.

Scrap prices are moving upward more rapidly, advancing the composite 33 cents last week to \$18.83, same level as in early July.

Detroit was the only district other than Pittsburgh to show a decline in steelmaking last week, dropping 4 points to 89 per cent. Increases were 1 point to $97\frac{1}{2}$ at Chicago, 4 points to 86 at Youngstown, 1 point to 86 at Cleveland and 15 points to $77\frac{1}{2}$ at St. Louis. Unchanged areas were eastern Pennsylvania at 89, Wheeling at 99, Buffalo at $88\frac{1}{2}$, Birmingham at 88, New England at 80 and Cincinnati at 78.

MARKET IN TABLOID ★

Demand

Little changed in aggregate from month ago.

Prices

Firm on finished steel; scrap extends upturn.

Production

Off $\frac{1}{2}$ -point to 90 per cent.

COMPOSITE MARKET AVERAGES

	Aug. 17	Aug. 10	Aug. 3	One Month Ago July, 1940	Three Months Ago May, 1940	One Year Ago Aug., 1939	Five Years Ago Aug., 1935
Iron and Steel	\$37.73	\$37.66	\$37.60	\$37.63	\$37.33	\$35.95	\$32.68
Finished Steel	56.60	56.60	56.60	56.60	56.60	55.60	54.02
Steelworks Scrap..	18.83	18.50	18.29	18.56	17.18	15.30	12.05

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	Aug. 17,	July	May	Aug.	Pig Iron	Aug. 17,	July	May	Aug.
	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	\$22.34
Steel bars, Chicago.....	2.15	2.15	2.15	2.15	Basic, Valley.....	22.50	22.50	22.50	20.50
Steel bars, Philadelphia.....	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia.....	24.34	24.34	24.34	22.34
Iron bars, Chicago.....	2.25	2.25	2.25	2.05	No. 2 foundry, Pittsburgh.....	24.21	24.21	24.21	22.21
Shapes, Pittsburgh.....	2.10	2.10	2.10	2.10	No. 2 foundry, Chicago.....	23.00	23.00	23.00	21.00
Shapes, Philadelphia.....	2.215	2.215	2.215	2.215	Southern No. 2, Birmingham.....	19.38	19.38	19.38	17.38
Shapes, Chicago.....	2.10	2.10	2.10	2.10	Southern No. 2, del. Cincinnati.....	22.89	22.89	22.89	20.89
Plates, Pittsburgh.....	2.10	2.10	2.10	2.10	No. 2X, del. Phila. (differ av.).....	25.215	25.215	25.215	23.215
Plates, Philadelphia.....	2.15	2.15	2.15	2.15	Malleable, Valley.....	23.00	23.00	23.00	21.00
Plates, Chicago.....	2.10	2.10	2.10	2.10	Malleable, Chicago.....	23.00	23.00	23.00	21.00
Sheets, hot-rolled, Pittsburgh.....	2.10	2.10	2.10	2.00	Lake Sup., charcoal, del. Chicago.....	30.34	30.34	30.34	28.34
Sheets, cold-rolled, Pittsburgh.....	3.05	3.05	3.05	3.05	Gray forge, del. Pittsburgh.....	23.17	23.17	23.17	21.17
Sheets, No. 24 galv., Pittsburgh.....	3.50	3.50	3.50	3.50	Ferromanganese, del. Pittsburgh.....	125.33	125.33	105.33	85.33
Sheets, hot-rolled, Gary.....	2.10	2.10	2.10	2.00					
Sheets, cold-rolled, Gary.....	3.05	3.05	3.05	3.05	Scrap				
Sheets, No. 24 galv., Gary.....	3.50	3.50	3.50	3.50	Heavy melt. steel, Pitts.....	\$18.75	\$19.55	\$18.00	\$16.15
Bright bess., basic wire, Pitts.....	2.60	2.60	2.60	2.60	Heavy melt. steel, No. 2, E. Pa.....	18.25	17.50	16.00	14.40
Tin plate, per base box, Pitts.....	\$5.00	\$5.00	\$5.00	\$5.00	Heavy melting steel, Chicago.....	18.25	17.25	16.65	13.75
Wire nails, Pittsburgh.....	2.55	2.55	2.55	2.40	Rails for rolling, Chicago.....	22.25	21.25	20.45	17.75
					Railroad steel specialties, Chicago.....	21.25	20.25	19.75	15.50
Semifinished Material					Coke				
Sheet bars, Pittsburgh, Chicago.....	\$34.00	\$34.00	\$34.00	\$34.00	Connellsville, furnace, ovens.....	\$4.75	\$4.75	\$4.75	\$3.75
Slabs, Pittsburgh, Chicago.....	34.00	34.00	34.00	34.00	Connellsville, foundry, ovens.....	5.75	5.75	5.75	5.00
Rerolling billets, Pittsburgh.....	34.00	34.00	34.00	34.00	Chicago, by-product fdry., del.....	11.25	11.25	11.25	10.50
Wire rods No. 5 to 3/4-inch, Pitts.....	2.00	2.00	2.00	1.92					

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel		Granite City, Ill.				Pittsburgh				Gulf ports			
Hot Rolled		3.60c	3.50c	3.50c	3.50c	21.50	22.00	25.50	30.50	2.45c	2.10c	2.34c	2.75c
Pittsburgh	2.10c	3.50c	3.50c	4.05c	22.50	32.50	36.50	52.00	2.10c	2.10c	2.10c	2.10c	
Chicago, Gary	2.10c	3.50c	3.50c	4.05c	17.00	17.50	24.00	35.00	2.10c	2.10c	2.10c	2.10c	
Cleveland	2.10c	3.50c	3.50c	4.05c	22.00	22.50	32.00	52.00	2.10c	2.10c	2.10c	2.10c	
Detroit, del.	2.20c	3.50c	3.50c	4.05c	Black Plate, No. 29 and Lighter								
Buffalo	2.10c	3.50c	3.50c	4.05c	Pittsburgh	3.05c	3.05c	3.15c	Tin and Terne Plate				
Sparrows Point, Md.	2.10c	3.50c	3.50c	4.05c	Chicago, Gary	3.05c	3.05c	3.15c	Tin Plate, Coke (base box)				
New York, del.	2.34c	3.50c	3.50c	4.05c	Granite City, Ill.	3.15c	3.15c	3.15c	Pittsburgh, Gary, Chicago	\$5.00	5.10	5.10	
Philadelphia, del.	2.27c	3.50c	3.50c	4.05c	Long Ternes No. 24 Unassorted				Mfg. Terne Plate (base box)				
Granite City, Ill.	2.20c	3.50c	3.50c	4.05c	Pittsburgh, Gary	3.80c	3.80c	4.55c	Pittsburgh, Gary, Chicago				
Middletown, O.	2.10c	3.50c	3.50c	4.05c	Pacific Coast	4.55c	4.55c	4.55c	Granite City, Ill.				
Youngstown, O.	2.10c	3.50c	3.50c	4.05c	Enamelling Sheets				4.40				
Birmingham	2.10c	3.50c	3.50c	4.05c	No. 10	No. 20	No. 20	No. 20					
Pacific Coast ports	2.65c	3.50c	3.50c	4.05c	Pittsburgh	2.75c	3.35c	3.35c					
Cold Rolled		3.05c	3.05c	3.05c	Chicago, Gary	2.75c	3.35c	3.35c					
Pittsburgh	3.05c	3.05c	3.05c	3.05c	Granite City, Ill.	2.85c	3.45c	3.45c					
Chicago, Gary	3.05c	3.05c	3.05c	3.05c	Youngstown, O.	2.75c	3.35c	3.35c					
Buffalo	3.05c	3.05c	3.05c	3.05c	Cleveland	2.75c	3.35c	3.35c					
Cleveland	3.05c	3.05c	3.05c	3.05c	Middletown, O.	2.75c	3.35c	3.35c					
Detroit, delivered	3.15c	3.05c	3.05c	3.05c	Pacific Coast	3.40c	4.00c	4.00c					
Philadelphia, del.	3.37c	3.05c	3.05c	3.05c	Corrosion and Heat-Resistant Alloys								
New York, del.	3.39c	3.05c	3.05c	3.05c	Chrome-Nickel								
Granite City, Ill.	3.15c	3.05c	3.05c	3.05c	No. 302	No. 304	No. 304	No. 304					
Middletown, O.	3.05c	3.05c	3.05c	3.05c	Bars	24.00	25.00	25.00					
Youngstown, O.	3.05c	3.05c	3.05c	3.05c	Plates	27.00	29.00	29.00					
Pacific Coast ports	3.70c	3.05c	3.05c	3.05c	Sheets	34.00	36.00	36.00					
Galvanized No. 24		3.50c	3.50c	3.50c	Hot strip	21.50	23.50	23.50					
Pittsburgh	3.50c	3.50c	3.50c	3.50c	Cold strip	28.00	30.00	30.00					
Chicago, Gary	3.50c	3.50c	3.50c	3.50c	Straight Chromes								
Buffalo	3.50c	3.50c	3.50c	3.50c	No. No.	No. No.	No. No.	No. No.					
Sparrows Point, Md.	3.50c	3.50c	3.50c	3.50c	410	430	442	446					
Philadelphia, del.	3.67c	3.50c	3.50c	3.50c	Bars	18.50	19.00	22.50	27.50				
New York, delivered	3.74c	3.50c	3.50c	3.50c									
Birmingham	3.50c	3.50c	3.50c	3.50c									

-The Market Week-

Buffalo	2.05c
Birmingham	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.70c

Iron

Chicago	2.25c
Philadelphia, del.	2.37c
Pittsburgh, refined	3.50-8.00c
Terre Haute, Ind.	2.15c

Reinforcing

New Billet Bars, Base

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

Rail Steel Bars, Base

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birm.	2.05c
Gulf ports	2.40c
Pacific Coast ports	2.50c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails	\$2.55
---------------------------------------	--------

(Per Pound)

Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c
Woven wire fencing (base C. L. column)	67
Single loop bale ties, (base C.L. column)	56
Galv. barbed wire, 80-rod spools, base column	70
Twisted barbless wire, column	70

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago Birmingham (except spring wire)	
Bright bess., basic wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Worcester, Mass., \$2 higher on bright basic and spring wire.	

Cut Nails

Carload, Pittsburgh, keg.	\$.85
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Cold-Finished Bars

Pittsburgh	Carbon 2.65c	Alloy 3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chi.		
Chicago, Massillon, Canton, Bethlehem	2.70c	
Detroit, delivered	2.80c	
S.A.E. Alloy Diff.	Alloy Diff.	
2000	0.35 3100	0.70
2100	0.75 3200	1.35
2300	1.55 3300	3.80
2500	2.25 3400	3.20
4100 0.15 to 0.25 Mo.		0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.		1.10
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.		

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.10c
Detroit, del.	2.20c
Philadelphia, del.	2.42c
New York, del.	2.46c
Pacific Coast ports	2.75c
Cooperage hoop, Young., Pitts.; Chicago, Birm.	2.20c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c
Carbon Cleve., Pitts.	
0.26-0.50	2.80c
0.51-0.75	4.30c
0.76-1.00	6.15c
Over 1.00	8.35c
Worcester, Mass. \$4 higher.	

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.35c
Lamp stock up 10 cents.	

Rails, Fastenings

(Gross Tons)

Standard rails, mill	\$40.00
Relay rails, Pittsburgh 20-100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	\$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills.	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham.	3.15c
Tie plates, base	2.15c
Base, light rails 25 to 60 lbs., 20 lbs. up \$2; 16 lbs. up \$4; 12 lbs. up \$8; 8 lbs. up \$10. Base railroad spikes 200 kegs or more; base plates 20 tons.	

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

1/2 x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1 1/2 and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.	
Step bolts	.60 off
Plow bolts	.68.5 off

Nuts

Semifinished hex. U.S.S. S.A.E.	
1/2-inch and less.	67 70
3/4-1-inch	64 65
1 1/2-1 3/4-inch	62 62
1 1/2 and larger	60

Hexagon Cap Screws

Upset 1-in., smaller	70.0 off
Square Head Set Screws	
Upset, 1-in., smaller	75.0 off
Headless set screws	64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.85c
Pacific Coast ports	2.95c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.	
Structural	3.40c

7/8-inch and under	65-10 off
Wrought washers, Pitts., Chl., Phila., to jobbers and large nut, bolt mfrs. l.c.l. \$5.40; c.l. \$5.75 off	

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2 1/2 and 1 1/2 less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel

In.	Blk.	Galv.
1/2	63 1/2	54
3/4	65 1/2	58
1-3	68 1/2	60 1/2

Iron

2	30	13
1-1 1/4	34	19
1 1/2	38	21 1/2
2	37 1/2	21

Lap Weld Steel

2	61	52 1/2
2 1/2-3	64	55 1/2
3 1/2-6	66	57 1/2
7 and 8	65	55 1/2
9 and 10	64 1/2	55
11 and 12	63 1/2	54

Iron

2	30 1/2	15
2 1/2-3 1/2	31 1/2	17 1/2
4	33 1/2	21
4 1/2-8	32 1/2	20
9-12	28 1/2	15

Line Pipe Steel

1 to 3, butt weld	67 1/2
2, lap weld	60
2 1/2 to 3, lap weld	63
3 1/2 to 6, lap weld	63
7 and 8, lap weld	64
10-inch lap weld	63 1/2
12-inch, lap weld	62 1/2

Iron

1/2 butt weld	25	7
1 and 1 1/2 butt weld	29	13
1 1/2 butt weld	33	15 1/2
2 butt weld	32 1/2	15
1 1/2 lap weld	23 1/2	7
2 lap weld	25 1/2	9
2 1/2 to 3 1/2 lap weld	26 1/2	11 1/2
4 lap weld	28 1/2	15
4 1/2 to 8 lap weld	27 1/2	14
9 to 12 lap weld	23 1/2	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut-lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Charcoal Iron	Steel	
1 1/2" O.D.	13	\$ 9.72 \$23.71
1 3/4" O.D.	13	11.06 22.93
2" O.D.	13	12.38 19.35
2 1/4" O.D.	13	13.79 21.68
2 3/4" O.D.	12	15.16
3" O.D.	12	16.58 26.57
3 1/4" O.D.	12	17.54 29.00
3 3/4" O.D.	12	18.35 31.36
4" O.D.	11	23.15 39.81
4 1/4" O.D.	10	28.66 49.90
5" O.D.	9	44.25 73.93
5 1/2" O.D.	7	68.14

Seamless

Hot Rolled	Cold Drawn	
1" O.D.	13	\$ 7.82 \$ 9.01
1 1/4" O.D.	13	9.26 10.67
1 1/2" O.D.	13	10.23 11.79
1 3/4" O.D.	13	11.64 13.42

2" O.D.	13	13.04	15.03
2 1/4" O.D.	13	14.54	16.76
2 1/2" O.D.	12	16.01	18.45
2 3/4" O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 1/4" O.D.	12	19.50	22.48
3 1/2" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 1/4" 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

Class B Pipe—Pet Net Ton	
6-in., & over, Birm.	\$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00
Class A Pipe \$3 over Class B	
Std. ftgs., Birm., base \$100.00.	

Semifinished Steel

Rerolling Billets, Slabs (Gross Tons)	
Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point.	\$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets	
Pitts., Chl., Gary, Cleve., Young, Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars	
Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago.	34.00
Detroit, delivered	36.00

Wire Rods	
Pitts., Cleveland, Chicago, Birmingham No. 5 to 3/8-inch incl. (per 100 lbs.)	\$2.00
Do., over 3/8 to 1 1/4-in. incl.	2.15
Worcester up \$0.10; Galveston up \$0.25; Pacific Coast up \$0.50.	

Skelp	
Pitts., Chl., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, fur.	\$4.35-4.60
Connellsville, fdry.	5.25-5.50
Connell, prem. fdry.	5.75-6.25
New River fdry.	6.25-6.50
Wise county fdry.	5.50-6.50
Wise county fur.	5.00-5.25

By-Product Foundry	
Newark, N. J., del.	11.38-11.85
Chicago, outside del.	10.50
Chicago, delivered	11.25
Terre Haute, del.	10.75
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	7.50
Indianapolis, del.	10.75
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

Spot, gal., freight allowed east of Omaha	
Pure and 90% benzol	15.00c
Toluol, two degree	27.00c
Solvent naphtha	26.00c
Industrial xylo	26.00c
Per lb. f.o.b. Frankford and St. Louis	
Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c
Eastern Plants, per lb.	
Naphthalene flakes, balls	7.00c
bbis. to jobbers	7.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	\$28.00

Pig Iron

Delivered prices include switching charges only as noted.
No. 2 foundry ls 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.

Delivered from Basing Points:

Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78		23.66	
Boston from Birmingham	24.12			
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00		
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	23.22			
Cincinnati from Hamilton, O.	23.24	24.11	23.61	
Cincinnati from Birmingham	23.06		22.06	
Cleveland from Birmingham	23.32		22.82	
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15			
Newark, N. J., from Bethlehem	25.53	26.03		
Philadelphia from Birmingham	24.46		23.96	
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	
Pittsburgh district from Neville Island				{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

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

Fire Clay Brick	Ladle Brick (Pa., O., W. Va., Mo.)	
Super Quality	Dry press	\$28.00
Pa., Mo., Ky.	Wire cut	26.00
First Quality	Magnesite	
Pa., Ill., Md., Mo., Ky.	Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
Alabama, Georgia	net ton, bags	26.00
New Jersey	Basic Brick	
Second Quality	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Pa., Ill., Ky., Md., Mo.	Chrome brick	\$50.00
Georgia, Alabama	Chem. bonded chrome	50.00
New Jersey	Magnesite brick	72.00
Ohio	Chem. bonded magnesite	61.00
First quality	Fluorspar	
Intermediate	Washed gravel, duty pd., tide, net ton	\$25.00-\$26.00
Second quality	Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	21.00
Malleable Bung Brick	Do. barge	21.00
All bases	No. 2 lump	22.00
Silica Brick		
Pennsylvania		\$47.50
Joliet, E. Chicago		55.10
Birmingham, Ala.		47.50

Ferrous Alloy Prices

Ferromanganese, 78-82%, carlots, duty pd.	\$120.00	Do., ton lots	11.75c	Do., spot	145.00	Silicon Metal, 1% iron, contract, carlots, 2 x 1/4-in., lb.	14.00c
Ton lots	130.00	Do., less-ton lots	12.00c	Do., contract, ton lots	145.00	Do., 2% Spot 1/4c higher	12.50c
Less ton lots	133.50	67-72% low carbon:		Do., spot, ton lots	150.00	Silicon Briquets, contract carloads, bulk, freight allowed, ton	\$69.50
Less 200 lb. lots	138.00	Car-Ton Less loads lots ton		15-18% ti., 3-5% carbon, carlots, contr., net ton	157.50	Ton lots	79.50
Do., carlots del. Pitts.	125.33	2% carb.	17.50c 18.25c 18.75c	Do., spot	160.00	Less-ton lots, lb.	3.78c
Spiegelstein, 19-21% dom.		1% carb.	18.50c 19.25c 19.75c	Do., contract, ton lots	160.00	Less 200 lb. lots, lb.	4.00c
Palmerton, Pa., spot	36.00	0.10% carb.	20.50c 21.25c 21.75c	Do., spot, ton lots	165.00	Spot 1/4-cent higher	
Do., 26-28%	49.50	0.20% carb.	19.50c 20.25c 20.75c	Alsifer, contract carlots, f.o.b. Niagara Falls, lb.	7.50c	Manganese Briquets, contract carloads, bulk, freight allowed, lb.	5.06c
Ferrosilicon, 50% freight allowed, c.i.	74.50	Spot 1/4c higher		Do., ton lots	8.00c	Ton lots	5.50c
Do., ton lot	87.00	Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb.	0.95	Do., less-ton lots	8.50c	Less-ton lots	5.78c
Do., 75 per cent	135.00	Calcium molybdate, lb. molyb. cont., f.o.b. mill	0.80	Spot 1/4c lb. higher		Spot 1/4c higher	
Do., ton lots	151.00	Ferrotitanium, 40-45% lb., con. ti., f.o.b. Niagara Falls, ton lots	\$1.23	Chromium Briquets, contract, freight allowed, lb. spot carlots, bulk	7.00c	Do., less-ton lots	5.78c
Spot, \$5 a ton higher		Do., less-ton lots	1.25	Do., ton lots	7.50c	Spot 1/4c higher	
Silicomanganese, c.i., 2% per cent carbon	118.00	20-25% carbon, 0.10 max., ton lots, lb.	1.35	Do., less 200 lbs.	8.00c	Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton	102.50
2% carbon, 106.00; 1%, 133.00		Do., less-ton lots	1.40	Spot, 1/4c higher		Do., spot	107.50
Contract ton price \$12.50 higher; spot \$5 over contract		Spot 5c higher		Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb.	\$2.50	Do., 34-40%, contract, carloads, lb., alloy	14.00c
Ferrotungsten, stand., lb. con. del. cars	1.90-2.00	Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls	\$2.25	Do., smaller lots	2.60	Do., ton lots	15.00c
Ferrovandium, 35 to 40%, lb., cont.	2.70-2.80-2.90	Do., less-ton lots	2.30	Vanadium Pentoxide, contract, lb. contained	\$1.10	Do., less-ton lots	16.00c
Ferrophosphorus, gr. ton, c.i., 17-18% Rockdale, Tenn., basis, 18%, \$3 unitage, 58.50; electric furn., per ton, c. l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% \$3 unitage	75.00	Spot is 10c higher		Do., spot	1.15	Spot 1/4c higher	
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots	11.00c	Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill	0.80	Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome	\$4.00c	Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb.	\$2.60
		Ferro-carbon-titanium, 15-18% ti., 6-8% carb., carlots, contr., net ton	\$142.50	Do., spot	\$9.00c	Do., 100-200 lb. lots	2.75
				88% chrome, contract	\$3.00c	Do., under 100-lb. lots	3.00
				Do., spot	\$8.00c	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant	\$0.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
							Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	S.A.E. 2300	S.A.E. 3100
Boston	3.98	3.86	4.86	3.85	3.85	5.66	3.51	4.48	4.66	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.76	3.76	3.76	3.75	5.56	3.38	4.40	4.05	3.31	4.09	8.59	7.19
Philadelphia	3.85	3.75	4.25	3.55	3.55	5.25	3.35	4.05	4.00	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	4.00	3.22	3.75	8.15	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	4.42	3.20	3.75	8.15	6.75
Detroit	3.43	3.23	3.48	3.60	3.65	5.27	3.25	4.30	4.64	3.20	3.80	8.45	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	8.84	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	4.45	4.00	4.00	6.40	4.30	6.50	5.25	...	6.60	10.65	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	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	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	7.20	5.75	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.48	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	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	9.40	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, 1500-3499 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

	Continental Channel or North Sea ports, gross tons**		Quoted in dollars at current value	Quoted in gold pounds sterling	Fdy. pig iron, 50-2.5	Basic bess. pig iron	Furnace coke	Billets	Standard rails	Merchant bars	Structural shapes	Plates, ½-in. or 5 mm.	Sheets, black, 24 gage or 0.5 mm.	Sheets, galv., corr., 24 ga. or 0.5 mm.	Plain wire	Bands and strips	French	Belgian	Reich	
	British gross tons U. K. ports	gross tons															£ s d	Francs	Francs	Mar
Foundry, 2.50-3.00 St.					\$24.24	6 0 0(a)	\$17.18	788	\$31.44	950	\$25.33	63								
Basic bessemer			\$33.23	3 18 0	22.83	5 13 0(a)	...	29.79	900	27.94	(b) 69.50									
Hematite, Phos. .03-.05					6.77	1 13 5	4.91	225	10.92	320	7.64	19								
Billets					42.42	10 10 0	26.62	1,221	42.20	1,275	38.79	96								
Standard rails					2.30c	12 15 6	1.69c	1,692	2.06c	1,375	2.38c	132								
Merchant bars					2.78c	15 8 6††	1.53c	1,530	2.06c	1,375	1.98c	110								
Structural shapes					2.46c	13 13 0††	1.49c	1,487	2.06c	1,375	1.93c	107								
Plates, ½-in. or 5 mm.					2.55c	14 3 0††	1.95c	1,951	2.42c	1,610	2.29c	127								
Sheets, black, 24 gage or 0.5 mm.					3.49c	19 17 6‡	2.30c	2,295‡	2.85c	1,900‡	2.59c	144‡								
Sheets, galv., corr., 24 ga. or 0.5 mm.					4.07c	22 12 6	3.59c	3,589	4.80c	3,200	6.66c	370								
Plain wire					3.83c	21 5 0	2.34c	2,340	3.00c	2,900	3.11c	173								
Bands and strips					2.91c	16 3 6††	1.71c	1,713	2.48c	1,650	2.29c	127								
†British ship-plates.																				
Continental, bridge plates, ½24 ga.																				
‡Rebate of 1½s on certain conditions.																				
††Rebate of 1½s on certain conditions.																				
**Gold pound sterling not quoted. ‡‡No quotations.																				

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

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.	15.00
Bos. dock No. 1 exp.	16.00-16.25
New Eng. del. No. 1	15.50-16.00
Buffalo, No. 1.	18.00-18.50
Buffalo, No. 2.	16.00-16.50
Chicago, No. 1.	18.00-18.50
Chicago, auto, no alloy	17.00-17.50
Cincinnati, dealers.	14.50-15.00
Cleveland, No. 1.	18.00-18.50
Cleveland, No. 2.	17.00-17.50
Detroit, No. 1.	†15.50-16.00
Detroit, No. 2.	†14.50-15.00
Eastern Pa., No. 1.	19.50-20.00
Eastern Pa., No. 2.	18.00-18.50
Federal, Ill., No. 2.	14.50-15.00
Granite City, R. R. No. 1	15.25-15.75
Granite City, No. 2.	14.25-14.75
Los Ang., No. 1, net	18.00-13.50
Los Ang., No. 2, net	12.00-12.50
N.Y. dock No. 1 exp.	15.00-15.50
Pitts., No. 1 (R.R.)	20.50-21.00
Pittsburgh, No. 1.	18.50-19.00
Pittsburgh, No. 2.	17.50-18.00
St. Louis, No. 1.	14.75-15.25
St. Louis, No. 2.	15.25-15.75
St. Louis, No. 2.	14.25-14.75
San Fran., No. 2, net	12.00-12.50
Seattle, No. 1.	15.00
Toronto, dirs., No. 1	11.00
Valleys, No. 1.	18.00-18.50

COMPRESSED SHEETS

Buffalo, new	17.00-17.50
Chicago, factory	17.50-18.00
Chicago, dealers	16.00-16.50
Cincinnati, dealers.	13.50-14.00
Cleveland	17.50-18.00
Detroit	†17.50-18.00
E. Pa., new mat.	19.50-20.00
E. Pa., old mat.	16.50-17.00
Los Angeles, net	10.00-10.50
Pittsburgh	18.50-19.00
St. Louis	12.00-12.50
San Francisco, net	10.00-10.50
Valleys	17.50-18.00

BUNDLED SHEETS

Buffalo, No. 1.	16.00-16.50
Buffalo, No. 2.	14.50-15.00
Cleveland	14.00-14.50
Pittsburgh	17.50-18.00
St. Louis	11.50-12.00
Toronto, dealers.	9.75

SHEET CLIPPINGS, LOOSE

Chicago	13.00-13.50
Cincinnati, dealers.	9.00-9.50
Detroit	†14.00-14.50
St. Louis	10.50-11.00
Toronto, dealers.	9.00

BUSHELING

Birmingham, No. 1.	13.00
Buffalo, No. 1.	16.00-16.50
Chicago, No. 1.	17.00-17.50
Cincin., No. 1 deal.	11.00-11.50
Cincin., No. 2 deal.	5.50-6.00
Cleveland, No. 2.	12.00-12.50
Detroit, No. 1 new.	†16.00-16.50
Valleys, new, No. 1	17.50-18.00
Toronto, dealers.	5.50-6.00

MACHINE TURNINGS (Long)

Birmingham	5.00
------------	------

Buffalo	12.00-12.50
Chicago	12.00-12.50
Cincinnati, dealers.	7.00-7.50
Cleveland, no alloy.	11.50-12.00
Detroit	†10.00-10.50
Eastern Pa.	13.50-14.00
Los Angeles	4.00-5.00
New York	†9.00-9.50
Pittsburgh	14.50-15.00
St. Louis	8.50-9.00
San Francisco	5.00
Toronto, dealers.	7.00-7.25
Valleys	11.50-12.00

SHOVING TURNINGS

Buffalo	13.00-13.50
Cleveland	12.00-12.50
Chicago	12.50-13.00
Chicago, spl. anal.	14.50-15.00
Detroit	†11.00-11.50
Pitts., alloy-free	15.50-16.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†6.00-6.25
Buffalo	11.50-12.00
Cincinnati, dealers.	5.50-6.00
Cleveland	12.00-12.50
Eastern Pa.	12.00-12.50
Detroit	†11.00-11.50
New York	†8.00
Pittsburgh	12.50-13.00
Toronto, dealers.	6.75

AXLE TURNINGS

Buffalo	16.00-16.50
Boston district	†9.50-10.00
Chicago, elec. fur.	18.00-18.50
East. Pa. elec. fur.	17.50-18.00
St. Louis	11.25-11.75
Toronto	6.00-6.50

CAST IRON BORINGS

Birmingham	8.00
Boston dist. chem.	†8.50-8.75
Buffalo	11.50-12.00
Chicago	11.50-12.00
Cincinnati, dealers.	5.50-6.00
Cleveland	12.00-12.50
Detroit	†11.25-11.75
E. Pa., chemical	14.50-15.00
New York	†8.00-8.50
St. Louis	8.00-8.50
Toronto, dealers.	6.75

RAILROAD SPECIALTIES

Chicago	21.00-21.50
---------	-------------

ANGLE BARS—STEEL

Chicago	20.50-21.00
St. Louis	17.75-18.25

SPRINGS

Buffalo	22.00-22.50
Chicago, coll.	22.00-22.50
Chicago, leaf.	20.50-21.00
Eastern Pa.	24.50-25.00
Pittsburgh	25.50-26.00
St. Louis	19.50-20.00

STEEL RAILS, SHORT

Birmingham	17.00
Buffalo	22.50-23.00
Chicago (3 ft.)	21.00-21.50
Chicago (2 ft.)	21.50-22.00
Cincinnati, dealers.	21.50-22.00
Detroit	†21.50-22.00
Pitts., 3 ft. and less	25.00-25.50
St. L. 2 ft. & less.	20.50-21.00

STEEL RAILS, SCRAP

Birmingham	15.00
Boston district.	†14.50-15.00

Buffalo	21.00-21.50
Chicago	18.00-18.50
Cleveland	23.00-23.50
Pittsburgh	21.50-22.00
St. Louis	17.50-18.00
Seattle	18.00-18.50

PIPE AND FLUES

Chicago, net.	12.50-13.00
Cincinnati, dealers.	11.00-11.50

RAILROAD GRATE BARS

Buffalo	13.00-13.50
Chicago, net	13.50-14.00
Cincinnati, dealers.	10.00-10.50
Eastern Pa.	16.50-17.00
New York	†11.50-12.00
St. Louis	12.00-12.50

RAILROAD WROUGHT

Birmingham	14.00
Boston district	†9.50-10.00
Eastern Pa., No. 1	20.00-20.50
St. Louis, No. 1	12.00-12.50
St. Louis, No. 2.	14.50-15.00

FORGE FLASHINGS

Boston district	†11.00-11.50
Buffalo	16.00-16.50
Cleveland	16.50-17.00
Detroit	†15.50-16.00
Pittsburgh	16.50-17.00

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	22.00-22.50

LOW PHOSPHORUS

Cleveland, crops	23.00-23.50
Eastern Pa., crops	25.00-25.50
Pitts., billet, bloom. slab crops	25.00-25.50

LOW PHOS. PUNCHINGS

Buffalo	21.00-21.50
Chicago	21.50-22.00
Cleveland	20.00-20.50
Eastern Pa.	25.00-25.50
Pittsburgh	24.00-24.50
Seattle	15.00
Detroit	†17.50-18.00

RAILS FOR ROLLING

5 feet and over

Birmingham	16.50
Boston	†15.75-16.00
Chicago	22.00-22.50
New York	†17.50-18.00
Eastern Pa.	23.00-23.50
St. Louis	19.50-20.00

STEEL CAR AXLES

Birmingham	18.00
Boston district	†18.00-18.50
Chicago, net	22.50-23.00
Eastern Pa.	24.50
St. Louis	21.00-21.50

LOCOMOTIVE TIRES

Chicago (cut)	22.00-22.50
St. Louis, No. 1	17.50-18.00

SHAFTING

Boston district	†18.75-19.00
New York	†19.00-19.50

Eastern Pa.	25.00-25.50
St. Louis, 1 1/4-3 3/4"	18.00-18.50

CAR WHEELS

Birmingham, iron.	13.00
Boston dist., iron.	†14.75-15.00
Buffalo, steel.	22.00-22.50
Chicago, iron	19.00-19.50
Chicago, rolled steel	21.00-21.50
Cincin., iron, deal.	18.00-18.50
Eastern Pa., iron.	21.50
Eastern Pa., steel.	24.50-25.00
Pittsburgh, iron	20.50-21.00
Pittsburgh, steel	25.50-26.00
St. Louis, iron	18.00-18.50
St. Louis, steel	19.00-19.50

NO. 1 CAST SCRAP

Birmingham	15.50
Boston, No. 1 mach.	†15.50-16.00
N. Eng. del. No. 2.	14.50-14.75
N. Eng. del. textile	18.75-20.00
Buffalo, cupola	18.00-18.50
Buffalo, mach.	19.50-20.00
Chicago, agri. net.	15.00-15.50
Chicago, auto net.	17.00-17.50
Chicago, railroad net	16.00-16.50
Chicago, mach. net.	16.50-17.00
Cincin., mach. deal.	18.75-19.25
Cleveland, mach.	21.25-21.75
Detroit, cupola, net.	†17.00-17.50
Eastern Pa., cupola	21.00-22.00
E. Pa., No. 2 yard.	18.00-18.50
E. Pa., yard fdry.	18.50-19.00
Los Angeles	16.50-17.00
Pittsburgh, cupola	19.00-19.50
San Francisco	14.50-15.00
Seattle	14.50-16.00
St. L., agri. mach.	18.00-18.50
St. L., No. 1 mach.	18.75-19.25
Toronto, No. 1 mach., net dealers	18.00-18.50

HEAVY CAST

Boston dist. break	†14.00-14.25
New England, det.	15.50-16.00
Buffalo, break	16.50-17.00
Cleveland, break, net	16.50-17.00
Detroit, auto net.	†17.25-17.75
Detroit, break.	†15.00-15.50
Eastern Pa.	20.00-20.50
Los Ang., auto, net.	13.00-14.00
New York break.	†16.00-16.50
Pittsburgh, break.	16.00-16.50

STOVE PLATE

Birmingham	10.00-11.00
Boston district	†11.00-11.50
Buffalo	15.00-15.50
Chicago, net.	11.50-12.00
Cincinnati, dealers.	10.50-11.00
Detroit, net.	†11.00-11.50
Eastern Pa.	16.50-17.00
New York fdry	†12.25
St. Louis	†11.50-12.00
Toronto dealers, net	12.00

MALLEABLE

New England, del.	21.50-22.00
Buffalo	21.50-22.00
Chicago, R. R.	22.00-22.50
Cincin. agri., deal.	15.50-16.00
Cleveland, rail	21.50-22.00
Eastern Pa., R. R.	22.50-23.00
Los Angeles	12.00
Pittsburgh, rail	23.50-24.00
St. Louis, R. R.	18.50-19.00

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	60.00
So. African, 50-52%	58.00-59.00
Indian, 49-50%	56.00
Brazilian, 46%	50.00-53.00
Cuban, 50-51%, duty free	71.00-73.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	\$0.75
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Ores

Lake Superior Iron Ore

Gross ton, 5 1/4 %
Lower Lake Ports

Old range bessemer	4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer.	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic	56-63%, contract.	10.00
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Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore,	45-55% Fe., 6-10% Mang.	Nom.
N. African low phos		nom.

Spanish, No. African basic, 50 to 60%	nom.
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Chinese wolframite, net ton, duty pd.	\$23.50-24.00
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Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c
F.O.B. Rio Janeiro.	

Scheelite, imp.	\$25.00
Chrome ore, Indian, 48% gross ton, cif.	\$28.00-30.00

Sheets, Strip

Sheet & Strip Prices, Pages 82, 83

Pittsburgh—Sheet mill operations were slightly lower last week. Buying was about the same as a week ago, however. For the past several weeks shipments have been running ahead of orders and backlogs are now down to a fairly close margin. However, demand from automotive producers has been small and it is expected larger releases will appear within the next two weeks.

Cleveland—Automotive sheet releases are tending upward and are responsible for most gains in total demand. Buying still is relatively light, previous heavy receipts dissuading consumers from more extensive coverage of future needs.

Chicago—Leading mills find buying by electric refrigerator and automotive interests increasing rapidly, stimulating an otherwise fairly quiet market. Aside from automotive and refrigerator activity, miscellaneous consumers have been taking only small lots and buying has been listless. Despite this there has been little change in delivery dates on sheet and strip. Backlogs of mills remain heavy.

Boston—Orders for narrow cold strip parallel heavy shipments and, despite rerolling operations averaging close to 85 per cent, backlogs are not being reduced. More tonnage is being booked for automotive needs. While some blanket orders for delivery beyond third quarter are being booked at open prices all orders now will not be completed before mid-October. Sheet buying is light.

New York—Sheet demand is relatively dull, reflecting seasonal influences and heavier buying of late spring and the early summer. In some lines, galvanized sheets for instance, jobbers are understood to be particularly well stocked. The general level of sheet business, despite the lull, is higher than usual at this season as a number of consumers, particularly manufacturers of household accessories, are building up stocks. Hot and cold sheet deliveries average around four weeks and this is also true in narrow strip.

Buffalo—Mild slackening in demand for sheets and strip steel was of short duration and pressure is again developing. Motor specifications are gradually expanding. Other consumers seek to build up stocks.

Cincinnati — Specifications for sheets, in large part against contracts which provide a backlog for the entire quarter, are between 75 and 80 per cent of capacity. Buying is fairly well maintained on

small tonnages. Galvanized demand is especially active. Automotive requirements are stationary. Tonnage for export and for household equipment are far below the year's peak.

St. Louis—Sheet and strip buying has declined moderately from the average of July, but shipments are reported somewhat higher than a month ago. Demands are diversified, with miscellaneous requirements accounting for most current business. Movement of galvanized roofing material, particularly to the South, shows some improvement, though still below usual seasonal volume.

Birmingham, Ala. — Sheet bookings, including manufacturers' and roofing sheets, although at a high rate for several months, have shown some increase in the past few weeks. The sheet mill is somewhat more active, with production at near capacity and considerable backlog. Not a great deal of strip is being produced.

Toronto, Ont. — While sheet sales showed minor tapering off for the week, demand continues well above average and inquiries indicate heavy booking for delivery over the remainder of the year. Large orders



The super-stamina of Yellow Strand is common knowledge in steel mills and foundries. Now, we're braiding this invincible wire rope into slings—the last word in flexibility, kink resistance, safety, durability.

Yellow Strand Wire Rope Plaited Safety Slings* are "soft"—handle highly finished steel rolls without damage. They hold irregular loads snugly, handle heaviest castings safely.

Many types and constructions and a wide range of fittings are available; or our engineers will design a Yellow Strand Plaited Safety Sling for your exact requirements.

Broderick & Bascom Rope Co., St. Louis
Branches: New York, Chicago, Seattle, Portland, Houston

Y-3

FREE Riggers' Hand Book

New edition contains full data on Plaited Safety Slings, standard Yellow Strand Slings, fittings, etc. No charge, of course.

Yellow Strand Plaited Safety Slings

*Murray Patents: U. S. Patents 1475859, 1524671; Canadian Patents 252874, 258068.

are pending from the automotive industry and active buying is reported from electric equipment makers.

also is taking good tonnage. Armor plate orders are increasing and facilities for heavier grades of armor plate are swamped. Mill operators are apprehensive that priority schedules may be enforced and are warning customers that they cannot be responsible for delivery in case such happens.

Plates

Plate Prices, Page 82

Pittsburgh — Merchant marine and naval construction continues to release plates in fair volume to local mills. General construction, both industrial and public works,

Boston — Mild improvement in plate buying includes slightly better specifications by railroads, boiler and structural shops, with miscellaneous demand holding. Shipyard releases are heavy. Warehouses are

placing little tonnage, stocks being well rounded. Deliveries on large heads and special alloys range to about six weeks, wider carbon plates about four weeks and light material two weeks or more.

Chicago — Plate demand is high, despite recent easing in orders for structural material. Needs of railroads are of increasing importance. Heavy industrial equipment and outdoor machinery makers are heavy consumers.

New York — Plate demand is fairly well sustained, particularly for wider sizes, on which deliveries are more extended. Shipyards continue among the principal buyers although a substantial amount is being fabricated by the machine tool and equipment industry; and a fairly good tonnage is being consumed in construction.

Tank and boiler manufacturers are in receipt of an increasing amount of government work, but there is relatively little municipal tank work.

Birmingham, Ala. — Plates continue to move well, largely because of railroad car requirements, shipbuilding and tank manufacturing. Mills here and at Gadsden are heavily booked.

Seattle—Ship construction, government and commercial, is creating strong demand for plates, some difficulty being experienced in getting prompt deliveries from eastern mills. Award of 1920 tons for eight submarine net tenders for the navy has been divided between Bethlehem Steel Co. and Columbia Steel Co. by the two contracting yards at Seattle and Portland.

San Francisco—The largest plate award went to General Engineering & Drydock Co., 1200 tons for four submarine net tenders for the Golden Gate, San Francisco. No action has yet been taken on C-3 type cargo vessels for the United States maritime commission, involving over 19,000 tons. Awards aggregated 1425 tons and brought the total to date to 54,297 tons, compared with 24,314 tons for the corresponding period in 1939.

Toronto, Ont. — Plate demand is high and tonnage orders are pending in connection with war contracts for motorized vehicles, ships and tanks. However, with Canadian output fully absorbed for this year most of the new demand is being taken care of by United States producers.

New Orleans—Fifteen hopper barges for Inland Waterways Corp., 211 Camp street, New Orleans, awarded to American Bridge Co., Pittsburgh, on a bid of \$62,660 per barge, complete with covers, will require 8325 tons of steel plates.

DIFFERENTIAL AIR DUMP CARS

Cut Cost of Refuse Disposal

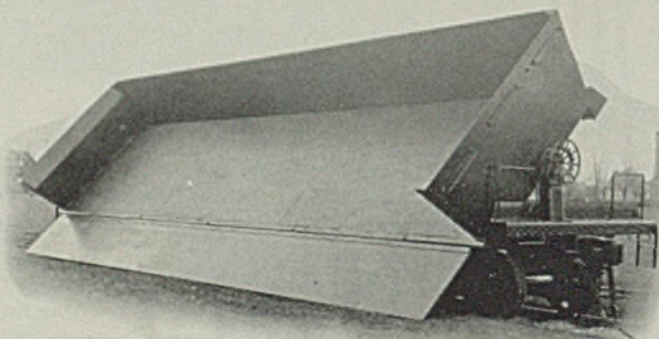


LEVEL LOAD 50 CU. YDS.

NORMAL LOAD 70 CU. YDS.

Dumps automatically to either side—down folding side doors chute material far away from the track—saves labor on dump.

SAFE—TROUBLE FREE—LONG LIFE



Differential air dump cars are also extremely useful for economical stock piling of coal, coke, stone, and other loose materials.

DESIGNERS AND MANUFACTURERS OF

Air Dump Cars in Standard 20, 30, 40 and 50 cu. yd. Sizes—
Mine Cars—Larry Cars—Locomotives—Complete Haulage Systems.

Write for Details

DIFFERENTIAL STEEL CAR CO., FINDLAY, OHIO

Plate Contracts Placed

8325 tons, 15 hopper barges, Inland Waterways Corp., 211 Camp street, New Orleans to American Bridge Co., Pittsburgh.

1920 tons, eight submarine net tenders for navy department to Bethlehem Steel Co. and Columbla Steel Co.; Lake Washington Shipyards, Seattle, and Commercial Iron Works, Portland, general contractors.

1200 tons, four submarine net tenders for government for Golden Gate, San Francisco, to General Engineering & Drydock Co., Alameda, Calif.

450 tons, elevated tank, government flying field, Chicopee, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Plate Contracts Pending

500 to 2625 tons, four to twenty lighters for navy department, schedule 2575; bids opened.

Unstated, two welded pipes for Marsing, Idaho, pumping plant; bids to Denver, Aug. 26.

Bars

Bar Prices, Page 82

Pittsburgh—Local mills continue to hold fair backlogs of merchant bars, both domestic and export business being fairly active, and tonnage for the automobile industry increasing. Most sellers have been able to make deliveries consistently.

Cleveland—Demand is fairly steady, showing little variation compared with a month ago. Production is being pushed, but heavy backlogs prevent noticeable improvement in deliveries. Little additional capacity for the remainder of this quarter is available in some grades, although most sizes of carbon bars can be shipped within four weeks.

Chicago—Bar sales generally were off slightly in the past week, though alloy requirements have held up well. Slight lull in the rate of purchasing is expected to be temporary, as heavier automotive and agricultural equipment needs are expected this month. Railroad steel requirements for car repairs and new rolling stock, as well as diesel electric locomotives, are increasing to a substantial point.

Boston—Orders for commercial steel bars have declined slightly, mostly for carbon bar grades. Alloy bars are in active demand. Consumption is heavy, notably by forging and small tool shops. Jones & Laughlin Steel Corp., Pittsburgh, has taken 1500 tons of carbon bars for induction furnace melting, for Watertown, Mass., arsenal, at 3.77c, delivered, with shipments to April. Award was by lot. Springfield, Mass., arsenal has bids on 325 tons of chromium-molybdenum bars for rifle barrels.

New York—While general commercial demand for bars is scarcely more than holding its own, if that,

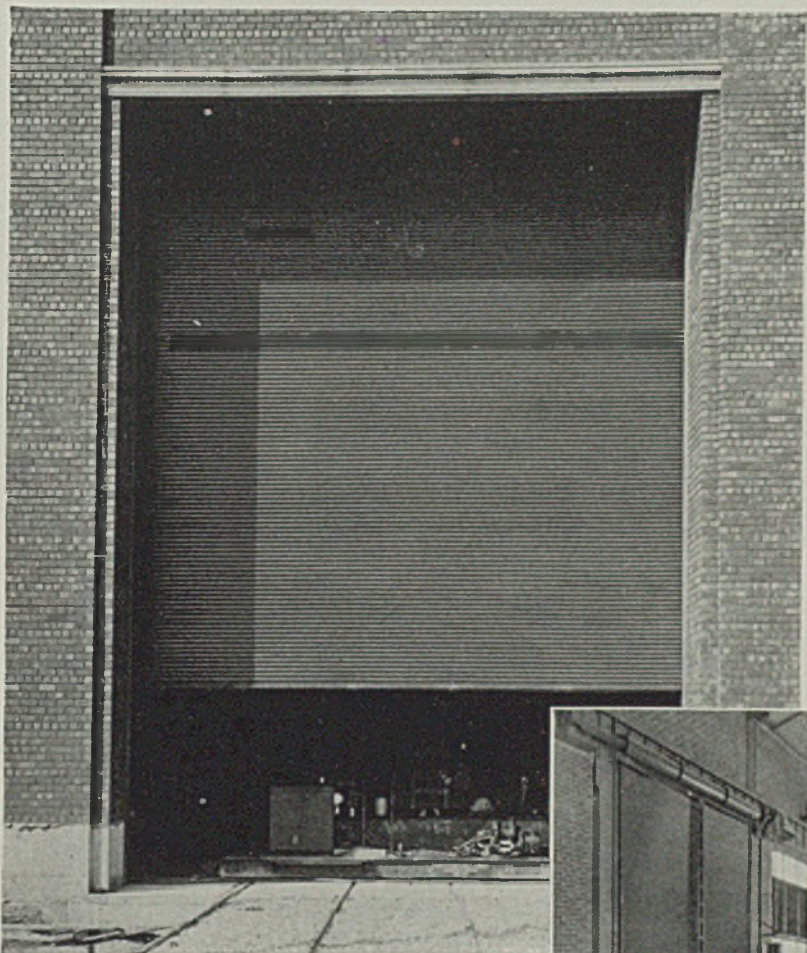
there is a steadily increasing volume of specifications from government arsenals, which are now on a 24-hour basis, and from the navy and various other government departments, reflecting development of the defense program. Machine tool builders and manufacturers of airplane engines and equipment are also active buyers.

Buffalo—Steady release against heavy backlogs keeps the movement of bar steel at good levels despite slackening in demand. Increased specifications are filed by machine tool makers and aircraft

manufacturers with some delay in shipments of specialty grades.

Birmingham, Ala.—Bar bookings are satisfactory, with considerable tonnage already available in most specifications. Reinforcing bars are among the most active of all bar products, and production is better than 85 per cent.

Toronto, Ont.—Bar buying continues brisk and mills are fully covered to the end of this quarter, although some minor tonnage may be squeezed out for rush delivery on war order account. Toolmakers are heavy buyers.



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KINNEAR

ROLLING DOORS

Pipe

Pipe Prices, Page 83

Pittsburgh—Pipe buying is fair, total volume showing little change from the preceding week. Line pipe activity is somewhat better. Deliveries are beginning to clog because of shortage of semifinished material, particularly plates for large size pipe. This has resulted in a stiffening of prices generally. Standard pipe moving through consigned stocks is at about the same level as

last week, and it is expected that August totals will be slightly better than July. Demand for pressure tubing is considerably better than at the first of the month.

Boston—Merchant steel pipe demand is slightly heavier, construction requirements accounting for most of the better inquiry. Resale prices continue mixed and weak. Cast pipe buying and releases lag. Tubing demand from miscellaneous users is fair and considerable pipe is being consumed by ship builders.

New York—New bids will be asked by the state department of

public works, Albany, N. Y., on work at the Meadowbrook hospital, Staten Island, requiring 450 tons of two to 12-inch cast pipe, it was reported here. The department of water supply, gas and electricity, New York, is preparing specifications for a substantial tonnage, likely to be submitted for bids early in the fall.

Seattle—New projects are coming out slowly; no large tonnages are pending but turnover of small lots is increasing. Denver has called bids Sept. 5 for pipe, fittings, valves, etc., for Coulee power plant, Spec. 1407-D. Rensselaer Valve Co. has an award for fittings at Woodland, Wash. Dallas, Oreg., has voted \$30,000 to lay 3 miles of 14-inch supply pipe.

San Francisco—The only cast iron pipe letting of size called for 255 tons of 4 to 8-inch pipe for Sacramento, Calif., of which United States Pipe & Foundry Co. took 128 tons and American Cast Iron Pipe Co. 127 tons. Awards totaled 395 tons and brought the aggregate for the year to 31,452 tons, compared with 21,608 tons for the same period last year.

Cast Pipe Placed

400 tons, 6 and 8-inch for Spokane, Wash., to Huse & Co., for Pacific States Cast Iron Pipe Co.

255 tons, 4 to 8-inch, Sacramento, Calif., allocated as follows: 128 tons 6-inch, to United States Pipe & Foundry Co., Burlington, N. J. and 127 tons of 4 and 8-inch to American Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

882 tons, 30-inch, feeder lines, Burbank, Compton, Long Beach and Torrance, Calif., for metropolitan water district, Los Angeles, alternate bids on welded and reinforced concrete pipe; bids opened.

200 tons, 6-inch, Brockton, Mass; bids Aug. 20.

200 tons, 6 to 20-inch and fittings; bids to C. T. Bogart, purchasing agent, Spokane, Wash., Aug. 22.

163 tons, 10 and 16-inch, east bay municipal utility district, Oakland, Calif.; bids Aug. 20.

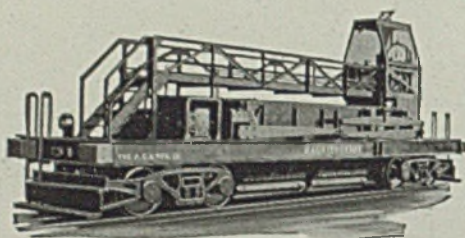
140 tons, 6-inch specification 2484, San Francisco; bids opened.

Tin Plate

Tin Plate Prices, Page 82

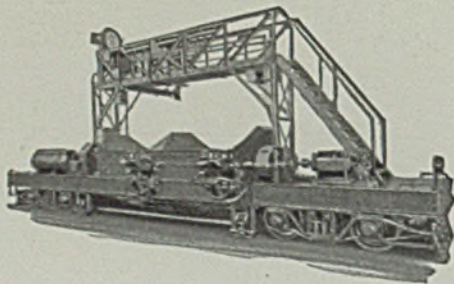
Pittsburgh—It is probable tin mill operations will not go much over the current rate of 70 per cent for the remainder of this year. Mill stocks are reported high, as well as those of consumers, and the end of the heavy buying season is in sight. Export demand is fairly good, and it is possible the fall seasonal decline will be less than usual as more buying comes in from this source.

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20 Ton — Double Compartment Scale Car. Journals provided with self aligning anti-friction bearings. Equipped with Atlas Indicator and Recorder.

20 Ton Two Compartment Scale Car with Orr Bin Gale Operating Mechanism. Anti-friction bearings. Equipped with Atlas Indicating and Recording Mechanism.



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Coke Oven Equipment

Pushers and Levellers—Coal Charging Cars—Door Handling Machines—Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

Rails, Cars

Track Material Prices, Page 83

Largest freight car buyer last week was the Atlantic Coast Line, which awarded 1565 units to several builders. Southern Pacific will build 190 cars in its own shops and Louisville & Nashville has bought 100 box cars. Southern Pacific has bought 51 light-weight streamlined passenger cars in addition to the streamlined trains recently bought in joint ownership with Chicago & North Western.

Prices on standard rails, 60 pounds and over, are being extended on all orders placed up to Dec. 31 for delivery not later than June 30 next year.

Car Orders Placed

Atlantic Coast Line, 1565 freight cars; 600 fifty-ton steel box and 15 covered cement cars to Pullman-Standard Car Mfg. Co.; 500 hoppers, 200 high-side gondolas and 100 phosphate cars to Bethlehem Steel Co., Bethlehem, Pa.; 100 steel box cars and 50 forty-ton stock cars to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.

Louisville & Nashville, 100 box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Southern Pacific, 51 light-weight streamlined passenger cars, to Pullman-Standard Car Mfg. Co., Chicago.

Southern Pacific, 190 seventy-ton freight cars to own shops; include 125 flat cars, 15 gondolas and 50 steel cabooses.

Union Pacific, 100 cement cars, to General American Transportation Corp., Chicago.

Locomotives Pending

Duluth, Missabe & Iron Range, eight steam locomotives; bids open soon

Rail Orders Pending

Wabash, 5000 tons 112-pound rails; purchase authorized by court.

Buses Booked

A.C.F. Motors Co., New York, has booked 32 buses, 18 for Eastern Massachusetts Street Railway Co., Boston; five for Gary Railways Co., Gary, Ind.; five for Memphis Street Railway Co., Memphis, Tenn.; three for South Carolina Electric & Gas Co.; one for Mon Valley Bus Co., Clairton, Pa.

Wire

Wire Prices, Page 83

Pittsburgh—Manufacturers' wire items are moving a little better, with releases on automobile tonnage and for the export market fairly active. General manufacturing demand is steady. In the merchant market, jobber buying is about the same as the preceding week.

Cleveland—Wire orders so far in August are smaller than a month ago. Buying remains relatively active and with backlogs heavy, pro-

duction continues at a good rate. Additional improvement in export demand is lacking, but automotive needs are starting to expand. While prompt shipment is not available on most items, few serious delivery problems have appeared.

Boston—Covering a wide range of products, orders and specifications for wire are fully up to heavy shipments. Production in some finishing departments are near capacity but mill backlogs are being lowered little. Rope mills are operating at a high rate with order volume maintained. Buying of spring wire is

improved. Decline in domestic buying of wire rods follows recent heavy deliveries which have built up inventories.

Birmingham, Ala.—Wire products sales are steady with considerable backlogs accumulating. Fencing and nails are probably in greatest demand and manufacturer's wire is quite active.

New York—Wire sellers anticipate no important changes in prices for fourth quarter, although they are taking the precaution, where requests have been made for shipments in that period, to quote on



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the basis of prices ruling at time of delivery. Current demand is featured by improved activity in manufacturers' wire and prospects for later in the month are even more encouraging.

are unable to keep up with new orders. Probability that defense tonnage will begin to come in shortly in heavy quantity adds to the problem because shell rounds will probably have to be rolled on structural mills.

Chicago—Orders have eased slightly, but inquiries are more active. Structural interests look forward to considerable defense program work in connection with both government and private plant expansions and new constructions.

Boston—Structural contracts are fewer, following recent heavy

awards. Pending volume being estimated is large, with several thousand tons required for cost-plus government contracts soon to be placed. Except for a span at Hartford, Conn., taking close to 8000 tons of shapes, piling and bars, bridge needs are light, small projects predominating.

New York—While structural awards are relatively light considerable work is being figured, with a still larger volume expected to come out shortly, particularly governmental and industrial work. However, new bids will be taken soon on about 5000 tons of school work, including two high schools up for figuring a few weeks ago, and bids will be opened on about 14,000 tons of subway work in Brooklyn, Aug. 27.

Philadelphia—Major Harry B. Vaughan, United States district engineer, Custom House building, Philadelphia, will take bids Sept. 9 for the superstructure for a bridge over the Chesapeake & Delaware canal at St. Georges, Del. The job will require 6500 tons of structural shapes, 800 tons of reinforcing bars and 300 tons of railings. Fabricators report deliveries on plain shapes average four weeks, with light sections five to six weeks. Prices are steady.

Buffalo—Interest in the structural steel market is at the best level of the year. Fabricators' backlogs and pending tonnage continue to grow. A better feeling is apparent from the increased number of private projects.

Seattle—Backlogs have increased since July 1 and shops generally have work for two months. Considerable tonnage will be required for navy department projects in this area but details are not yet available. Bethlehem Steel Co. is reported to have taken 341 tons piling for a flood control project at Portland. The same company and Columbia Steel Co. will furnish 280 tons for eight navy submarine net tenders to be built by Seattle and Portland yards.

San Francisco—Structural let-

Shapes

Structural Shape Prices, Page 82

Pittsburgh—Backlogs continue to mount and local producers see no possibility of a respite. Mills

STEEL STACKS LINED QUICKLY ... AT LOW COST!

Protection from heat and corrosion means new life for old stacks... longer life for new stacks!

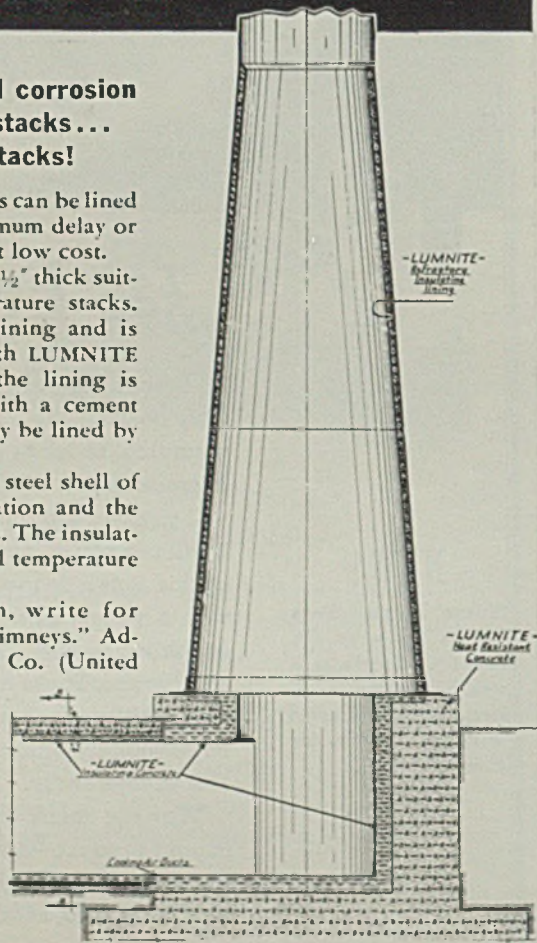
YOUR new or old steel stacks can be lined with LUMNITE with minimum delay or interruption to service—and at low cost.

Here is a protective lining $2\frac{1}{2}$ " thick suitable for low or high temperature stacks. It is a refractory insulating lining and is corrosion resistant. Made with LUMNITE and a refractory aggregate, the lining is easily and quickly applied with a cement gun. Small stacks and flues may be lined by hand before or after erection.

LUMNITE linings guard the steel shell of stacks and flues against oxidation and the attack of sulphurous flue gases. The insulating property keeps down shell temperature and improves draft.

For detailed information, write for "LUMNITE in Stacks and Chimneys." Address Atlas Lumnite Cement Co. (United States Steel Corporation Subsidiary), Dept. S-5, Chrysler Bldg., New York City.

► Cross-section of steel stack, showing Lumnite protective lining, and a duct installation below built of Lumnite heat-resistant concrete lined with Lumnite insulating concrete.



LUMNITE FOR REFRACTORY CONCRETE

Shape Awards Compared

	Tons
Week ended Aug. 17.....	19,467
Week ended Aug. 10.....	24,101
Week ended Aug. 3.....	49,720
This week, 1939.....	14,241
Weekly average, year, 1940..	21,250
Weekly average, 1939.....	22,411
Weekly average, July.....	33,958
Total to date, 1939.....	726,775
Total to date, 1940.....	701,962

Includes awards of 100 tons or more.

—The Market Week—

tings totaled 9353 tons. This brought the aggregate to date to 162,053 tons, compared with 76,698 tons for the corresponding period in 1939.

St. Louis — New business in structural shapes and operations of fabricators have picked up here. Fabricators are purchasing at the best rate in a number of weeks. Principal projects on which bids have been taken include 600 tons for a glass factory addition and 500 tons for a railroad equipment builder's new paint shop.

Birmingham, Ala. — Shape output has been consistently good for many weeks. Highway and bridge work accounts for a large part of the tonnage.

Toronto, Ont. — Placing of war project contracts during the past week totaling approximately \$10,000,000 will have further stimulating effect on structural steel sales, while further orders of approximately \$40,000,000 are pending on war account for the Canadian and British governments. Steel fabricators report backlogs well ahead of a year ago. Awards for the past week were about 7000 tons with some 30,000 tons pending.

Shape Contracts Placed

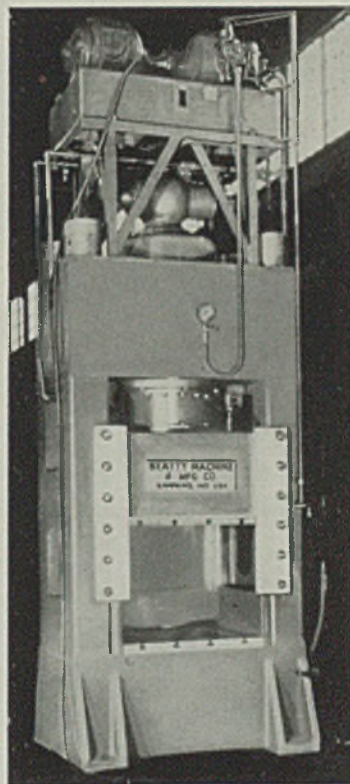
- 1000 tons, storage shop and tool buildings, Douglas Aircraft Co., Santa Monica, Calif., to Bethlehem Steel Co., Bethlehem, Pa.
- 1000 tons, power house, American Gas & Electric Service Corp., Deepwater, N. J., to Fort Pitt Bridge Works, Pittsburgh.
- 1000 tons, shop, specification 9906, navy yard, Bremerton, Wash., to Pacific Car & Foundry Co., Seattle.
- 875 tons, aircraft storehouse, Corpus Christi, Tex., to Austin Bros., Dallas, Tex.
- 850 tons, glass and lamp factory, for General Electric Co., Jackson, Miss., to Pidgeon-Thomas Iron Co. Inc., Memphis, Tenn.
- 840 tons, warehouse and train shed, for Sherwin-Williams Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.
- 835 tons, paper mill, Pensacola, Fla., to Stupp Bros. Bridge & Iron Co., St. Louis.
- 810 tons, power house extension, Commonwealth & Southern Corp., Comstock, Mich., to American Bridge Co., Pittsburgh.
- 750 tons, addition, Lockheed Aircraft Co., Burbank, Calif., to Consolidated Steel Corp., Los Angeles.
- 700 tons, mill buildings for Mead Corp., Chillicothe, O., to Bethlehem Steel Co., Bethlehem, Pa.
- 630 tons, power house units 3 and 4, Pickwick dam, Sheffield, Ala., for Tennessee valley authority, to American Bridge Co., Pittsburgh.
- 600 tons, bridge, Illinois Central railroad, Gilbertsville, Ky., for Tennessee valley authority, to Bethlehem Steel Co., Bethlehem, Pa.
- 575 tons, viaduct, Middlesex, Pa., for

- state, to Bethlehem Steel Co., Bethlehem, Pa.
- 450 tons, addition to factory, for Briggs Mfg. Co., Detroit, to Whitehead & Kales Co., Detroit.
- 400 tons, Old Oregon trail subway, Nyssa, Oreg., for state, to Bethlehem Steel Co., Bethlehem, Pa.
- 390 tons, piling, U. S. Gypsum Co., dock, East Chicago, Ind., to Inland Steel Co., Chicago.
- 380 tons, state bridge, Perche creek, Columbia, Mo., to Illinois Steel Bridge Co., Jacksonville, Ill.
- 395 tons, grade crossing elimination, Johnson City, N. Y., through Davis & Stearns Inc., Whitesboro, N. Y., to American Bridge Co., Pittsburgh.
- 364 tons, structurals for division engi-

- neer, South Pacific division, San Francisco, to Columbia Steel Co., San Francisco.
- 355 tons, factory building, for Calco Chemical Co., Bound Brook, N. J., to Bethlehem Steel Co., Bethlehem, Pa.
- 341 tons, sheet piling, flood control project, Portland, Oreg., reported placed with Bethlehem Steel Co., Bethlehem, Pa.; Jacobsen-Jenson Co., Portland, general contractor.
- 320 tons, bridge 469, over Milk river, Malta, Mont., for Great Northern railway, to American Bridge Co., Pittsburgh.
- 320 tons, state highway bridge, Rolling Prairie, Ind., to Bethlehem Steel Co., Bethlehem, Pa.
- 315 tons, grade separation, Michigan

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- HYDRAULIC PRESS BRAKE & FLANGER
- HIGH-SPEED HYDRAULIC PRESSES



The illustration and the table below covers standard pattern high speed press for prompt delivery.

NOTE THE OPERATING SPEEDS AS SHOWN IN TABLE BELOW:

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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HAMMOND, IND.

Central, Military avenue, Dearborn, Mich., to American Bridge Co., Pittsburgh.

280 tons, eight navy submarine net tenders to Columbia Steel Co. and Bethlehem Steel Co.; Lake Washington Shipyards, Seattle, and Commercial Iron Works, Portland, general contractors.

270 tons, flue system, for American Smelting & Refining Co., Barber, N. J., to Belmont Iron Works, Philadelphia.

265 tons, addition to power house, for Southern Colorado Power Co., Pueblo, Colo., to Muskogee Iron Works, Muskogee, Okla.

265 tons, grade separation, route 51, section 73-SF, Orland Park, Ill., for state, to American Bridge Co., Pittsburgh.

250 tons, plant addition, for Consolidated Machine Tool Co., Rochester, N. Y., to Leach Steel Corp., Rochester, N. Y.

240 tons, Lowry field technical school, Denver, to E. Burkhardt & Sons Steel & Iron Works Co., Denver.

230 tons, buildings Orford Soap Co., Manchester, Conn., to Standard Structural Co., Hartford, Conn.

215 tons, underpass, Duncansville, Pa., for state, to American Bridge Co., Pittsburgh.

210 tons, science building, Dennison university, Granville, O., to R. C. Mahon Co., Detroit.

200 tons, grade separation, Lake Forest, Ill., for state, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, furnace building, Victor Chem-

ical Co., Mt. Pleasant, Tenn., to Ingalls Iron Works Co., Birmingham, Ala.

200 tons, office building and machine shop, Racine, Wis., Twin Disc Clutch Co., to Wisconsin Bridge & Iron Co., Milwaukee, Wis.

182 tons, H-columns, San Joaquin river bridge, Fresno and Madera counties, California, for state, to Bethlehem Steel Co., San Francisco.

180 tons, bridge 36.70, New York, New Haven & Hartford, Southport, Conn., to Phoenix Bridge Co., Phoenixville, Pa.

180 tons, bridge No. 5921, Red Lake county, Minnesota, to American Bridge Co., Pittsburgh.

160 tons, storage building, for Electric Boat Co., Groton, Conn., to Bethlehem Fabricators, Bethlehem, Pa.

150 tons, sheet piling, postoffice, Spokane, Wash., to Bethlehem Steel Co., Seattle, Wash.

150 tons, two hangars and a shop for city, Phoenix, Ariz., to Allison Steel Co., Phoenix, Ariz.

150 tons, state highway bridge FAS-40-64, Sullivan county, New York, to Phoenix Bridge Co., Phoenixville, Pa.

125 tons, bridge, FAP-130G, Tolland-Willington, Conn., to American Bridge Co., Pittsburgh.

115 tons, housing project, Dayton, O., to Midwest Ornamental Iron Works.

110 tons, bridge work, Texas Pacific Railway Co., Fort Worth, Tex., to Virginia Bridge Co., Roanoke, Va.

110 tons, factory building, Apex Tool Co., Dayton, O., to Burger Iron Co., Akron, O.

110 tons, bridge FAS-112A, Racine county, Wisconsin, to Wisconsin Bridge & Iron Co., Milwaukee.

110 tons, Sabin bridge, Westminster, Vt., to American Bridge Co., Pittsburgh.

105 tons, sheet piling, East Side replacement sewer, Washington, to Bethlehem Steel Co., Bethlehem, Pa., through Joseph Lombardi, Washington.

100 tons, bridge, Butler county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

100 tons, pattern shop for Farrel-Birmingham Co., Tonawanda, N. Y., to R. S. McManus Steel Construction Co., Inc., Buffalo.



1906-1940

DAMASCUS

Manganese and Alloy Steel
CASTINGS

FROM ½ TO 1000 POUNDS

Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

We are in position to manufacture specialties made of manganese and alloy steel castings and invite concerns to write us about their requirements.

DAMASCUS STEEL CASTING CO.
New Brighton, Pa.
(Pittsburgh District)

Shape Contracts Pending

11,000 tons, piling for a naval station in Rhode Island, bids expected to be asked shortly.

6800 tons, bridge, St. Georges, Del., over Chesapeake & Delaware canal, bids Sept. 9, United States engineer, Philadelphia; includes 300 tons railing.

1500 tons, bridge, Belt parkway, Brooklyn, N. Y., for Triborough bridge authority, New York; Mill Basin Asphalt Co., Brooklyn, low on general contract; 312 tons of reinforcing bars also will be required.

1400 tons, bridge, route 14, Bradford county, Pa.; H. R. Dickens, Philadelphia, low.

1377 tons, including 330 tons sheet piling, units 7 to 10, power houses, Bonnevillie dam project, Oreg., bids postponed from Aug. 20 to Aug. 30.

1100 tons, mental defective school building, Willowbrook, N. Y., for state.

1000 tons, state highway viaduct, Huntington county, Pennsylvania.

700 tons, state bridge FA-SH-40-2, Schaghticoke, N. Y.

500 tons, paint shop, American Car & Foundry Co., St. Louis; bids Aug. 12.

- 450 tons, bureau of reclamation, dam trash racks, Rutledge, Tex.; bids Aug. 22.
- 400 tons, Fuller elementary school, Chicago, for city.
- 400 tons, theater and store building, Amherst, N. Y.
- 350 tons, reconstruction bridge, Mahoning avenue, Youngstown, O., for Mahoning county.
- 335 tons, bridge, Fayette county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Aug. 23.
- 334 tons, new or used sheet piling, United States engineer office, Portland, Oreg., for flood wall; bids rejected and new bids opened.
- 300 tons, addition to factory, for Yellow Truck & Coach Mfg. Co., Pontiac, Mich.
- 260 tons, bridge, route 336, Northumberland county, Pennsylvania; E. L. Miller & Sons, Shamokin, Pa., low.
- 250 tons, bridge, route 353, Lycoming county, Pennsylvania; F. D. Kessler, Philadelphia, low.
- 225 tons, state bridge PSC-5934, Dunkirk, N. Y.
- 200 tons, bridge 38.07, Fairfield, Conn., for New York, New Haven & Hartford railroad.
- 200 tons, powerhouse, United States Tobacco Co., Chicago; bids Aug. 13.
- 180 tons, hangar for city, Denver, Colo.; bids opened.
- 165 tons, beam spans, Marion, Mich. for state.
- 142 tons, sheet piling, Spokane river bridge, Stevens and Lincoln counties, Washington, for state; bids opened.
- 140 tons, trashracks, Marshall Ford dam, Rutledge, Tex., for bureau of reclamation.
- 130 tons, alterations to factory 27, for Flour Bros. Co., Kimberly, Wis.
- 120 tons, bridge over Alum creek, Columbus, O., for Franklin county.
- 110 tons, three I-beam bridges, Westmoreland county, Pennsylvania; bids to state highway department, Harrisburg, Aug. 23.
- 100 tons, highway bridge, Newstead, N. Y.
- 100 tons or more, power substation, Tacoma, Wash.; Star Iron Works, Tacoma, low.

housing projects account for most of the heavy reinforcing bar needs, more than 10,000 tons pending for Connecticut river work. Small lot buying is increasing. Prices are firmer than usual.

New York — Reinforcing bar business is expanding, with action expected momentarily on 2500 tons for the Kingsboro housing project in Brooklyn, through Caldwell-Wingate Co., general contractor.

San Francisco — Movement of reinforcing material continues active and 2439 tons were booked, bringing the aggregate for the year

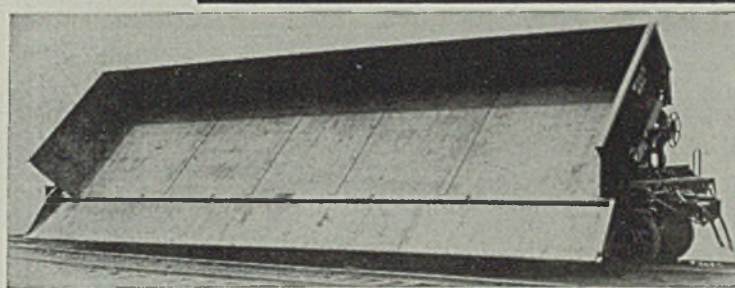
to 114,347 tons, compared with 104,333 tons for the same period a year ago.

Toronto, Ont. — War demand for steel on new construction account has created heavy demand for reinforcing bars and large orders have been booked during the past six weeks, with some 10,000 additional tons pending.

Seattle—Rolling mills are operating at 65 to 70 per cent, with excellent prospects for balance of the year. Buying is firm and steady without speculative trend. Volume of sales is ahead of corresponding



**65 YARDS OF WASTE
GOING OVER THE DUMP
AT THE TURN OF A HANDLE!**



It's the Koppel 50-Yard Automatic Air Dump Car in action—piling up daily savings in haulage costs for the Steubenville Works of Wheeling Steel Corporation. Twelve Koppel 70-ton Waste Disposal Cars have been in regular service in their plant since 1937. Every day more economy-wise steel men are being impressed by the arithmetic of performance and economics behind the Koppel 50-Yard Air Dump Car.

We will welcome the opportunity of demonstrating this recent Koppel development and explain the dollar and cents savings you can effect on your operations.

PRESSED STEEL CAR CO., INC.

(KOPPEL DIVISION)

NEW YORK

PITTSBURGH

CHICAGO



Reinforcing

Reinforcing Bar Prices, Page 83

Pittsburgh—Inquiry continues to come out in fair volume, with placements sustained. Prices are fairly steady, with mill prices firm in the East, although weak spots are reported in the Middle West. Jobber prices have slipped in most parts of the country, although most of this is on small orders and much of it will be filled from stock.

Chicago—Demand holds at recent levels, though total of pending tonnage on the market has increased. Involved are several unusually large but as yet unestimated tonnages in government construction at Savannah, Ill., where some 17 buildings, in addition to bombproof shelters and passages, will be built; an underground powder plant near Jefferson, Ind., and a 500,000-square foot warehouse, Chicago.

Boston — Flood protection and

Behind the Scenes with STEEL

Under The Weather

■ If we seem a little hoarse and keep interrupting with a rollicking sneeze, please forgive us. We've joined that happy little army with summer colds and our favorite brand of smokes tastes much like the shavings from our pencil sharpener.

Welcome Back

■ Last week, you'll remember, we expressed what apparently was needless sympathy for an old friend subscriber out in Independence, Kansas who regretfully canceled his subscription because he was being retired from business with a bit of heart trouble. But never let it be said that B. H. Uhrich doesn't have what it takes. He writes: *When I saw your column this week it sounded so too, too pathetic I darn near bawled myself. I'll be eternally blessed if I am going to be that way, so you can just tell the circulation department to reinstate my address plate and bill me for two more years!*

Lasting Success

■ Penton's Almanac has been on subscribers' desks now for two months but still a day doesn't pass without several people telling us what a swell job it is. Frank A. Schoombs' letter was on top of the pile this morning: *Penton's Almanac exactly suits our requirements in doing industrial field research and has been a source of frequent and satisfactory reference. On the theory of better late than never, I should like to thank you for my copy.*

Button, Button

■ In the warehouse of Thomas Martindale & Co., Philadelphia food specialty company, someone discovered not long ago a grand total of 6,000,000 buttons left there since the World war. They were manufactured just before the Armistice and were not accepted by the government. The original owner had stored

them and long since disappeared. Sales-minded James J. Martindale shot out a letter: *Our fond hope is that someone, somewhere, has a yen for six million buttons—just like these darn things we own. The Price? Oh boy, we can get together on price if you're interested. (It worked.)*

Joe Pays 'Em All

■ We just heard about Giuseppe Pucci, who sometime ago ran a 2 col. x 7-in. personal adv. in the *Aliquippa Gazette*. It seems that Joe was let out of J. & L. back in 1936 because of some union activity or other. Times got hard for Joe and although he picked up a few days of WPA work now and then, he had to eat and wear clothes and pay the rent. So, he was forced to borrow \$2 here and \$3 there—even \$10 sometimes—from his Croatian, Serbian, Italian and Polish friends. But months went by and Joe couldn't pay them back. And Joe lost a lot of sleep over it. Finally not long ago, NLRB ordered the company to reinstate him with back pay and Joe suddenly got a check for \$1624.43, the most money he had ever seen at one time. So he walked the streets paying back \$2 here, \$3 there, until every cent he could remember had been repaid. But for fear he had forgotten somebody, and to give vent to his Italian joy and gratitude, Joe ran his ad with his picture and everything. He thanked everyone for having trusted him and asked anyone he may have overlooked to let him know, because it was most certainly unintentional.

We Try To

■ That's just the opposite of the way we get along with our creditors. They are always panting on the back of our neck, with an outstretched paw and a steely glare in their eyes.

Gesundheit!

■ Sniffle, sniffle—KERCHOO!!

SHRDLU

—The Market Week—

period last year. Merchant bars are moving actively. Few sizable projects are up for figures but small orders for building projects and public works have given mills considerable tonnage.

Reinforcing Steel Awards

- 1250 tons, navy yard, Brooklyn, N. Y., through J. Rich Stears Inc., general contractor, New York, to Igoe Bros., Newark, N. J.
- 1000 tons, power house, Fort Peck, Mont., for United States engineers, to Sheffield Steel Corp., Kansas City, Mo.; Wood Bros. Construction Co., contractor.
- 900 tons, various constructions and locations, Michigan Bell Telephone Co., to Truscon Steel Co., Youngstown, O.
- 680 tons, plant expansion, Federal Shipbuilding & Dry Dock Co., Kearney, N. J., to an unstated seller.
- 500 tons, naval station, Mobile, Ala., to Truscon Steel Co., Youngstown, O.
- 500 tons, Grace hospital buildings, Detroit, to Great Lakes Steel Corp.; through Concrete Steel Fireproofing Co.
- 500 tons, flood control project, Dwight pumping station, Chicopee, Mass., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.; B. A. Garditto, Inc., Boston, contractor.
- 470 tons, plant addition, Sterling Products Co., Rahway, N. J., through Samworth Hughes, Paterson, N. J., general contractor, to Concrete Steel Co., New York.
- 400 tons, building for Campbell Soup Co., Chicago, to Calumet Steel Co., Chicago; Avery Brundage Co., contractor.
- 400 tons, flood control work, York, Pa., to Bethlehem Steel Co., Bethlehem, Pa.; Benjamin Foster Co., contractor.
- 375 tons, five hangars, war department, Chicopee, Mass., through Tuller Construction Co., Red Bank, N. J., to Truscon Steel Co., Youngstown, O.
- 230 tons, bulkhead No. 32, East River, New York, through Allen N. Spooner, New York, general contractor, to Concrete Steel Co., New York.
- 230 tons, subway section D-2-B, Chicago, to Republic Steel Corp., Cleveland, through Olney J. Dean Co., Chicago; John C. Tully Co., contractor.
- 215 tons, municipal sewage disposal work, contract No. 3, City Island, New York, through J. L. Washburn, New York, to Truscon Steel Co., Youngstown, O.
- 200 tons, contract 4243, navy yard, Brooklyn, N. Y., through Walter Klidde, New York, general contractor, to an unstated seller.
- 190 tons, bridge No. 1999, Rockford, Ind., to Laclède Steel Co., St. Louis.
- 190 tons, residence hall, Illinois University, Urbana, Ill., to Concrete Steel

Concrete Bars Compared

	Tons
Week ended Aug. 17	9,147
Week ended Aug. 10	10,935
Week ended Aug. 3	18,521
This week, 1939	3,462
Weekly average, year, 1940	8,823
Weekly average, 1939	9,197
Weekly average, July	8,543
Total to date, 1939	333,340
Total to date, 1940	291,172

Includes awards of 100 tons or more.

Co., Chicago, through J. P. Cullin Co.,
Janesville, Wis.
179 tons, city hall, Fresno, Calif., to
Kyle & Co., Fresno, Calif.
110 tons, bridge, Hoopeston, Ill., to Calu-
met Steel Co., Chicago.
110 tons, Gila river bridge, Graham
county, Ariz., for state, to Allison
Steel Mfg. Co., Phoenix, Ariz.
110 tons, grade crossing elimination,
Johnson City, N. Y., through Davis
& Stearns, Inc., Whitesboro, N. Y., to
Joseph T. Ryerson & Son, Inc., Chicago.
105 tons, bridge, Carsonville, Mich., to
Bethlehem Steel Co., Bethlehem, Pa.
103 tons, highway project FARC-40-59,
Dutchess county, New York, to Repub-
lic Steel Corp., Cleveland, through Trus-
con Steel Co., Youngstown, O.; D. W.
Winkelman Co., contractor.
100 tons, hospital building, Rochester,
N. H., to Concrete Steel Co., Boston.
100 tons, factory building, Kewanee, Ill.,
to Joseph T. Ryerson & Son Inc., Chi-
cago.
Unstated tonnage, housing units, GA-
6-5, Pt. 2, Atlanta, Ga., through Beers
Construction Co., Atlanta, to Truscon
Steel Co., Youngstown, O.

Reinforcing Steel Pending

1400 tons, Charles Perkins housing,
USHA-Md-2-3, Baltimore; bids Aug. 14.
1000 tons, piers and bulkhead, Newport
News Shipbuilding & Dry Dock Co.,
Newport News, Va.; bids Aug. 15.
800 tons, bridge, St. Georges, Del., over
Chesapeake & Delaware canal, bids
Sept. 9, United States engineer, Phila-
delphia.
700 tons, Libby-Owens-Ford Glass Co.,
warehouse and factory, Rossford, O.;
A. Bentley & Sons Co., contractor.
460 tons, reservoir, specification 10,004,
navy yard, Norfolk, Va.; bids Aug. 15.
400 tons, store, Sears Roebuck & Co.,
Washington; bids Aug. 26.
360 tons, Rapid Transit Railway, route
110, section 10, New York; bids Aug. 27.
312 tons, bridge, Belt parkway, Brook-
lyn, N. Y., for Triborough bridge au-
thority, New York; Mill Basin Asphalt
Co., Brooklyn, low on general con-
tract; 1500 tons of shapes also in-
volved.
300 tons, manufacturing building, Ot-
tumwa, Iowa, for Morrell & Co.; bids
Aug. 6.
250 tons, approximately, road work, Bell
parkway, Brooklyn, for Triborough
bridge authority New York; B. Ture-
carno Contracting Co., Brooklyn, low
bidder.
220 tons, dock for Maryland Dry Dock
Co., Baltimore; bids Aug. 8.
206 tons, San Luis Obispo Creek bridge,
San Luis Obispo county, California,
for state; bids Aug. 28.
175 tons, bridge, Fayette county, Penn-
sylvania; bids to state highway de-
partment, Harrisburg, Pa., Aug. 23.
158 tons, feeder line for metropolitan
water district, Los Angeles, specifica-
tion 340; bids opened.
135 tons, bridge, Armstrong county,
Pennsylvania; bids to state highway
department, Harrisburg, Pa., Aug. 23.
120 tons, bureau of reclamation, inv-
itation B-22,374-A, Mills, Wyo.; bids
opened.
111 tons, housing project, Hammond, Ind.
Unstated tonnage, government powder
plant, near Jefferson, Ind., extensive
underground construction.
Unstated tonnage, warehouse and of-
fice building, one-story, 500,000 square
feet, Sprague-Warner Co., Chicago.
Unstated tonnage, loading plant, in-

cluding 17 buildings, ten bombproof
shelters and connecting passageways,
army proving ground, Savanna, Ill.;
bids in.

have been buying in the merchant
market. Foundry iron is moving
fairly well, but does not match de-
mand from nonintegrated steel
plants.

Pig Iron

Pig Iron Prices, Page 84

Pittsburgh — No change is re-
ported in the number of furnaces
active in the district, with 40 stacks
producing iron. Production is be-
ing pushed as much as possible. Ap-
parently coke supplies are ample,
although practically all consumers

Cleveland—Shipments are mod-
erately heavier, influenced by ex-
panding foundry schedules. Better-
ment in consumption is fairly well
diversified, with part of the upturn
seasonal. Automotive requirements,
although heavier, have yet to reach
the volume involved when all in-
terests are in production of new
models. Some melters are enlarging
inventories, but there is no general



• Yes, for more and more aircraft applications, ARMCO Stainless Steels are winning their "wings." Stainless makes possible light, strong, rigid sections. This way both commercial and military planes can have greater fuel capacity, longer cruising range. You'll find ARMCO Stainless is easy to fabricate by the fast spot-weld process. This means rapid production at lower cost . . . smooth plane surfaces . . . less drag . . . higher speeds. And

ARMCO Stainless for exhaust stacks and collector rings resists hot, corrosive gases, cuts maintenance costs, assures longer airworthy life.

Why not streamline *your* sky-birds with ARMCO Stainless? Try this strong, corrosion-resisting metal for wings, fuselage, collector rings, exhaust manifolds, engine cowlings, floats, hulls and wing faring. Or what products for home or industry would you like to make better of stainless? The American Rolling Mill Company, 300 Curtis St., Middletown, Ohio.



ARMCO STAINLESS STEELS

"RACKS STILL IN SERVICE AFTER EIGHT MONTHS"

says this user
of

**UNICHROME*
RACK COATING-W**

Still they come—the enthusiastic reports from manufacturers and job platers alike, after using "Unichrome" Rack Coating*. For example, one user writes:—

"The rack we had coated eight months ago is still in service in our Chromium Plating cycle. Your Rack Coating-W has been completely satisfactory".

The reason these "Unichrome" Rack Coating-W users find this rack coating material so outstanding is its unequalled combination of advantages:—

1. Withstands boiling cleaners and all plating solutions
2. Tough—withstands wear and tear of handling
3. Contains no ingredients harmful to plating solutions
4. Cuts costs—reduces frequency of recoatings
5. Easy to apply—"dip and force dry" method
6. Light in color—easy to see how well the rack is covered
7. Any part of rack can be recoated without recoating entire rack.

Write for Bulletin No. 20
Containing Complete Information—

Platers without rack coating facilities may have their racks coated with "Unichrome" Rack Coating-W* by Chromium Corporation of America, 4645 West Chicago Avenue, Chicago, Ill. Belke Manufacturing Company, 947 North Cicero Avenue, Chicago, Ill. or Lea Manufacturing Co., of Waterbury, Conn.

UNITED CHROMIUM INCORPORATED

51 East 42nd Street, New York, N.Y.
2751 E. Jefferson Ave., Detroit, Mich.
Waterbury, Conn.

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



—The Market Week—

tendency to anticipate future needs on a large scale.

Chicago — Releases from nonintegrated steel mills, agricultural equipment and automotive foundries have increased in the past week, bringing shipments so far this month fairly well ahead of those of a like period in July. In addition general foundry releases are higher, as a result of improved rate of melt. Total iron shipment for this month will be better than for July.

Boston — Pig iron shipments and foundry melt are gaining moderately but buying is in scattered, small prompt-delivery lots. Stocks taken in several weeks ago are being liquidated gradually. Consumption is broadening. The district blast furnace is producing close to 500 tons daily, operating on lake ore.

New York — August pig iron movement will probably surpass that of July. Specifications to date are ahead of the corresponding period in July and there is a greater disposition among consumers to seek rush shipments, indicating they have received heavier orders or their original calculations were short.

Export demand is featureless, apart from continued heavy shipments to Great Britain against contracts placed some time ago. Export activity otherwise is confined to scattered inquiry from Portugal and South Africa.

Philadelphia — Pig iron buying is slow but some consumers already have evidenced interest in fourth quarter requirements. Books for this period have not been officially opened. Available supplies are not large. A leading steel company is out of the market and a second interest is busy satisfying its own requirements and those of its regular customers and tonnage needed against a large export order.

Buffalo — With shipments augmented by one producer building up merchant stock at eastern storage points, the current pig iron movement is one of the best on record. Increased shipments to motor makers and heating equipment manufacturers are noted.

Cincinnati — Melters are taking pig iron, both northern and southern, in unchanged volume. The melt is near 70 per cent of district capacity, but there may be some inventory building by foundries. Contracts adequately cover needs, so that current buying is confined to fill-in tonnages.

St. Louis — Shipments have responded to the increase in foundry operations, and fair sales have been made for remainder of the quarter. Fourth quarter buying has yet to appear in large volume. Most melt-

ers are experiencing better business, with casting demand for machine tool, engine and machinery builders especially active. Stove foundry schedules are expanding seasonally.

Birmingham, Ala. — Pig iron production continues at 100 per cent. Necessity for repairs is seen but equipment is busy to meet steelmaking requirements.

Toronto, Ont. — Merchant pig iron sales are heavy with melters showing special interest in both spot and future needs. Deliveries are over 5000 tons weekly.

Scrap

Scrap Prices, Page 86

Pittsburgh — Closing of the Pennsylvania railroad list raised quotations on railroad items, but the price for standard open-hearth grades remains unchanged. Dealer buying at higher levels has strengthened the market somewhat, but there is practically no mill buying. Continued operations at high levels cause rumors of imminent buying, but thus far none has been done.

Cleveland — Scrap is firm, with shipments on contracts steady. Some restrictions continue on shipments to the Valley. Supplies are sufficient for current needs and melters are not buying actively.

Chicago — Prices generally advanced last week, No. 1 heavy melting steel reaching \$18.50, a price confirmed by a mill purchase at this figure. Most scrap items moved up 50 cents, though some railroad grades were up \$1. Improved level was accompanied by more activity in trading. Scrap now is coming out more freely. Besides recent mill buying, foundries and electric furnace interests have been fairly active.

Boston — Scrap buying by district foundries and steel works is light, melters utilizing stocks bought several weeks ago. Most activity centers in export orders. Prices are mainly unchanged with firmer undertone. Close to 2000 tons loaded for Italy just before that country's entrance into the war has been sold for domestic melting. A Japanese ship is loading 7000 tons, mainly No. 2 steel and bundles.

New York — Stronger demand in eastern Pennsylvania has raised brokers' buying prices here to a spread of \$16 to \$16.50, f.o.b. New York, for heavy breakable cast, \$15.50 to \$16 for No. 1 heavy melting steel and \$14.50 to \$15 for No. 2 auto steel. Machine shop turnings are also higher at \$9 to \$9.50. A good movement of scrap for export continues, particularly for

England, against running contracts.

Philadelphia — Further strength has developed in iron and steel scrap and quotations on many grades are 50 cents to \$1 a ton higher. A substantial tonnage has been purchased quietly by leading mills although a number have remained out of the market. Four or five cargoes of scrap originally scheduled for shipment to Italy have been sold to a leading consumer and are being unloaded at Philadelphia and Baltimore. Central Railroad of New Jersey also has sold 27,000 tons of material in dismantled cars to a large consumer. Foundry grades are also sharing in the stronger market evidenced in steelmaking grades but some are slow to move upward. It is understood that movement to Britain will slow down in September and October due to diversion of some boats from the scrap trade.

Buffalo — The market is steady as activity is confined to dealers shipping against contracts. Dealers report ample offerings to cover commitments, but further supplies within the prevailing range of \$18 to \$18.50 a ton for No. 1 steel are none too plentiful. Boat shipments, via the canal and lakes, continue to arrive.

Detroit — All steel scrap grades continue exceptionally strong here, reflecting the national situation. Mills still are not inclined to buy, with European affairs keeping many buyers uncertain regarding the outlook. Heavy melting steel and compressed sheets are quoted 50 cents higher, with several other grades up 50 cents to \$1.

Cincinnati — Although prices are unchanged in absence of adequate test, the iron and steel scrap market is much stronger. Dealers look for early expansion in consumer buying but no evidence has appeared. Activity is affected by wariness against short sales. Some dealer stocking is being done on speculation.

St. Louis — Despite inactive mill buying the market is decidedly firmer and heavy melting steel is up 25 to 75 cents. Strength results principally from a shrinkage in offerings from the country and large industries. Consumer stocks are being reduced, and heavier buying is looked for the next few weeks. Inquiries from outside districts are increasing.

Birmingham, Ala. — While the market has firmed up considerably in the past few days, prices are unchanged, with No. 1 heavy melting at \$15.

Seattle — Embargo restrictions on No. 1 scrap have not affected the Coast market as most exports consist of No. 2 and rails. Some export licenses for No. 1 have been

granted and material continues to move to Japan. Rolling mills are again in the market, paying \$14 and \$13, gross, respectively, for No. 1 and No. 2. Export prices are \$1.50 to \$2 higher than domestic levels.

Toronto, Ont. — Brisk action again features iron and steel scrap. Melters are making special efforts to build up inventories and a number have indicated intention of increasing forward delivery contracts. Mills and foundries are taking all offerings and dealers are being pressed to meet all demands. Imports from the United States continue in large volume. Dealers' prices are firm and unchanged.

San Francisco — Movement of scrap continues well sustained and yard stocks in most open-hearth furnace yards are of fair proportions. No change in quotations is noted.

will show considerable improvement. Activity is decidedly widespread, both as to origin of orders and commodities involved.

Boston—Buying from warehouses is well diversified and with most jobbers it is slightly heavier. Alloy inquiry, notably in bars, is substantial. Hot-rolled and galvanized sheet prices are muddled but secondary prices on most other products are firm. Mill buying by warehouses is slack, most having covered through this quarter, with stocks well balanced.

New York—A number of leading jobbers in diversified lines, report increasing business. Heavy products appear to be moving more actively, plates and shapes particularly. Sheet business is rather sluggish, especially galvanized sheets, on which prices are weak.

Philadelphia—Leading warehouses note that more than half current buying may be traced in some way to government purchases. August is showing an improvement over July.

Buffalo — A gain is noted in buying but sellers report the market still somewhat spotty. Buying lacks the vigor expected to develop with the national defense program.

Cincinnati—Warehouse sales are

Warehouse

Warehouse Prices, Page 85

Chicago — Further slight betterment has been noted. Volume and tonnage of bookings so far this month exceed the July rate and distributors are confident the month

RODINE

Makes Pickling Efficient

- Stops Waste of Acid and Metal
- Prevents Over-Pickling
- Eliminates Acid Fumes
- Reduces Acid Brittleness
- Cuts Costs
- Increases Tonnage

Bulletin on request

AMERICAN CHEMICAL PAINT CO.

DEPT. 310, AMBLER, PENNA.

Detroit, Mich.

Walkerville, Ont.

off moderately, to reflect vacations. Tonnage in individual sales is sustained, and country business is unchanged. Building items are dull. Prices are firm.

St. Louis—Noticeable betterment has appeared in business of warehouse and jobbing interests since early August. Much of the improvement is in plates, structurals, nuts, bolts and rivets. Movement of bales ties has expanded seasonally.

Steel in Europe

Foreign Steel Prices, Page 83

London—(By Cable)—Demand for hematite pig iron is increasing in Great Britain and steps are being taken to increase domestic output of iron ore. Arrivals of ingots and semifinished steel from America are furnishing sufficient steel for rolling mill requirements. Exports of tin plate are fair, especially to Australia and other Dominions. Exports of black and galvanized sheets are limited by home defense requirements.

Ferroalloys

Ferroalloy Prices, Page 84

New York—Considering heavy consumption, ferromanganese is still moving slowly. This may be attributed to anticipatory buying in June, when consumers generally laid in extra stocks because of impending price advance. It is possible, however, that these stocks will not go as far as was expected,

for the reason that consumption has been at a higher rate.

Ferromanganese is holding at \$120, duty paid, Atlantic and Gulf ports. Spiegeleisen, 19 to 21 per cent, is holding at \$36, Palmerton, Pa., and 26 to 28 per cent, at \$49.50. Forward buying in June because of price advances also is having an effect on spiegeleisen shipments. However, consumption is being well sustained.

May Blow in Blast Furnace at Chester, Pa.

Delaware River Steel Co., Chester, Pa., is considering blowing in its blast furnace stack, no definite decision having been reached. The stack has annual capacity of 120,000 tons of basic, bessemer, foundry, malleable and low phosphorus pig iron. It has been idle since 1930.

Manganese Ore Imports Double Last Year's Rate

New York—Reflecting expanding demand, importations of manganese ore so far this year have already surpassed those for all of last year. According to reliable trade estimates, arrivals up to Aug. 10 amounted to 711,000 gross tons, 35 per cent and over manganese, against approximately 698,447 tons for all of 1939. This latter is distinguished from 627,129 tons imported for consumption in that year.

During the first ten days of Au-

gust about 30,000 tons came in. During the first six months arrivals totaled 508,682 tons, against 334,081 tons in the corresponding period last year. At the present highly accelerated rate arrivals are exceeding consumption, it is pointed out.

Much of the improvement in demand, especially over recent months, has been attributable to government buying. Late last month and the early part of this, the Metals Reserve Co., Washington, a recently organized federal purchasing agency, bought approximately 127,000 tons, practically all, if not all of which, was brought in from abroad, particularly India and South Africa. In addition, 10,000 tons of manganese ore from Chile also were reported under negotiation at that time.

During the preceding several months, the federal government through one agency or another bought, according to trade estimates, about 80,000 tons, mostly from abroad, Cuba in particular. More recently, the Metals Reserve Co., as reported at the time, placed an order for 240,000 gross tons of domestic ore, the contract going to the Anaconda Copper Mining Co., which will have a \$1,000,000 smelting plant at Anaconda, Mont., in production within six to nine months, on the concentrating of this ore. The plan is to furnish the ore at the rate of 80,000 tons annually for a period of three years.

Commenting to STEEL on manganese ore buying by the Metals Reserve Co., Charles B. Henderson, president, says: "Purchases will be made from both producers and dealers and at such times and at such prices as to not interfere with the supply of manganese ore for industry. It is not the intention of Metals Reserve Co. to make this stockpile of manganese ore available to industry at this time."

While prices involved in recent purchases of manganese ore by the Metals Reserve Co. are not being disclosed at this time, the general commercial market is largely unchanged, but strong. This is particularly true with respect to Russian ore, which has to come through the Mediterranean but which is still holding at around 60 cents per unit, before duty.

CUBAN-AMERICAN MANGANESE TO EXPAND SANTIAGO PLANT

Cuban-American Manganese Corp., Santiago, Cuba, will expand its Cristo manganese ore concentrating plant one-third by Jan. 1, 1941, as a national defense measure, according to Langbourne M. Williams Jr., president. The addition will give the plant an annual capacity of 130,000 tons of ferro-grade ore.



3-WAY VALVES

FOR OPEN HEARTH FURNACES

By NICHOLSON

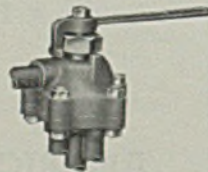
It answers a long-felt need among open hearth operators, because it alternates the flow of oil and steam to the oil burners on the furnaces without showing signs of leakage or wear. For use on air, steam, water or oil up to 300 lb. pressures, this valve can't be surpassed. Our catalog No. 140 carries concise descriptions of this and other valves: foot, solenoid and motor operated. Catalog on request.

PRESSURE-TIGHT SERVICE AT LOW COST

The Nicholson lever-operated style J valve for air or oil pressures up to 125 lbs. was introduced to meet the demand for a low-priced valve. Least expensive of the Nicholson valves, it gives the same trouble-free service that the larger and more expensive valves do. It, too, is described in our catalog No. 140.

OTHER NICHOLSON PRODUCTS:

Nicholson welded floats, piston and weight operated traps. Flexible couplings, expanding mandrels, arbor presses, compression shaft couplings, steam eliminators and separators. Compressed air traps.



W. H. NICHOLSON & COMPANY

177 OREGON ST., WILKES-BARRE, PA.

Nonferrous Metal Prices

Aug.	Copper			Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Alumi- num 99%	Anti- mony Amer. Spot, N. Y.	Nickel Cath- odes	
	Electro, del. Conn.	Lake, del. Midwest	Casting, refinery								
10	*10.75	11.00	10.50	51.75	50.37 1/2	4.75	4.60	6.25	18.00	14.00	35.00
12	*10.75	11.00	10.50	51.75	50.50	4.75	4.60	6.25	18.00	14.00	35.00
13	*10.75	11.00	10.50	51.37 1/2	50.25	4.75	4.60	6.25	18.00	14.00	35.00
14	*10.75	11.00	10.50	50.75	50.25	4.75	4.60	6.50	18.00	14.00	35.00
15	*10.75	11.00	10.50	50.75	50.30	4.75	4.60	6.50	18.00	14.00	35.00
16	*10.75	11.00	10.50	50.75	50.30	4.75	4.60	6.50	18.00	14.00	35.00

*Based on sales by custom smelters; mine producers unchanged at 11.50c.

MIL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 11.00c Conn. copper

Sheets

Yellow brass (high).....18.23

Copper, hot rolled19.62
Lead, cut to jobbers.....7.00
Zinc, 100 lb. base.....11.50

Tubes

High yellow brass20.98
Seamless copper20.12

Rods

High yellow brass13.26
Copper, hot rolled.....17.12

Anodes

Copper, untrimmed16.87

Wire

Yellow brass (high).....18.48

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York6.75-7.00
Cleveland7.25-7.50
Chicago7.00-7.25
St. Louis7.75

Heavy Copper and Wire

New York, No. 18.37 1/2-8.62 1/2
Cleveland, No. 18.25-8.50
Chicago, No. 18.25-8.50
St. Louis8.75

Composition Brass Turnings

New York6.37 1/2-6.62 1/2

Light Copper

New York6.37 1/2-6.62 1/2
Cleveland6.25-6.50
Chicago6.25-6.50
St. Louis6.75

Light Brass

Cleveland3.50-3.75
Chicago4.25-4.37 1/2
St. Louis4.25

Lead

New York4.10-4.20
Cleveland3.60-3.75
Chicago3.50-3.75
St. Louis3.50-3.75

Zinc

New York3.75-4.00
Cleveland3.25-3.50
St. Louis3.25-3.50

Aluminum

Misc., cast, Cleveland8.50
Borings, Cleveland6.50
Clips, soft, Cleveland14.00
Misc. cast, St. Louis7.75-8.00

SECONDARY METALS

Brass Ingot, 85-5-5-5, less carloads.....11.75
Standard No. 12 aluminum.....14.00

Nonferrous Metals

New York — An advance in slab zinc prices last week was the outstanding development in nonferrous metal markets and was contrary to the general trend in metals. Neither consumers nor sellers were anxious to make new commitments in view of the rising tempo in the Battle of Britain.

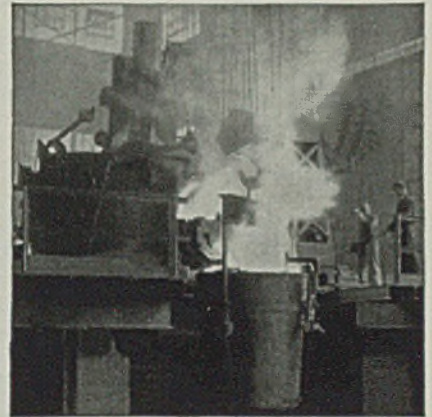
Copper — In comparatively quiet trading electrolytic copper prices held unchanged on the basis of 10.75c, Connecticut Valley, in the custom smelter and resale markets; 11.00c in the mine producers; and

9.90c, f.a.s. New York, in the export market. Available supplies for near-by delivery are believed to be rather tight. The July statistical report showed an increase of 16,237 tons in refined stocks to a total of 215,823 as refined output rose to 90,995 tons and deliveries of domestic copper rose to 74,758 tons.

Lead — A decline of \$5 per ton during the week ended Aug. 10 failed to stimulate buying interest, although sales were estimated at about 10,000 tons. Threat of heavy importation of Mexican and other foreign lead has prevented the do-



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General Manager

mestic market from capitalizing on the industry's strong statistical position.

Zinc—Due to scarcity of nearby supplies coupled with continued heavy consumption here, active demand from abroad, and absence of foreign competition, prime western advanced $\frac{1}{4}$ -cent on Wednesday, Aug. 14, to 6.50c, East St. Louis.

Tin—Straits spot eased steadily from 51.75c at the beginning of the week to only 50.75c at the close. Consumers are fairly well covered and are not pressing for additional coverage at present.

Equipment

New York — Navy inquiries for machine tools have expanded rapidly since the beginning of this month. Approximately 117 machine tools are on inquiry for bids before the end of August and additional equipment is now being sought for bids in September. Bids have been opened on 26 various types of machine tools for the Brooklyn navy yard and 26 medium heavy lathes for the Boston navy yard.

Other outstanding lists include 23 milling machines for the Brooklyn and Philadelphia navy yards, bids Aug. 27, and 14 engine lathes for Norfolk, Va., Aug. 30. Bids on a list of 10 engine lathes for Newport, R. I., were opened Aug. 16. Various other machine tools are pending for these yards and other points. In addition to machine tools, there are many inquiries for forging equipment, welding sets, and similar equipment.

Export demand is rather feature-

less at the moment. Meanwhile, an effort is being made to dispose of machine tools on dock here, intended originally for French destination. As this equipment was designed for metric measurements, it is being disposed of slowly, it is said.

Chicago — Machinery bookings are somewhat improved, but inquiries and actively pending jobs are more substantially increased. Deliveries are about the greatest problem and there has been no improvement in this situation. Average delivery on plate and sheet metal machinery is 8 to 12 weeks, sellers say, with 12 to 16 weeks required for heavier machines. This is considered good compared with six to 12 months generally required

on machine tools. Lathes and shapers run to five and six-month deliveries, while one year is considered fairly good on milling equipment. On late model used equipment recent sales have been made at prices much above the cost of certain machines when new.

Seattle—General improvement in the metal trades is reflected in increased interest in machinery and equipment, sales being above normal seasonal levels. All items are in good demand. Denver has called bids Aug. 26 for automatic floats, control shaft mechanisms, actuators, etc. for Coulee dam, Spec. 1408-D and Sept. 2 for three 5000-ampere bus structures and one oil circuit breaker for Coulee, Spec. 931.

Construction and Enterprise

Ohio

CINCINNATI — Wright Aeronautical Corp., 132 Beckwith avenue, Paterson, N. J., plans large airplane plant near here, costing several million.

CLEVELAND—Slidey Mfg. Co. has been incorporated by H. H. Felsman, Leader building, Cleveland, and William A. Slidey, 1285 Oakwood avenue, Columbus, O., to manufacture metal advertising signs. Office is at 55 East State street, Columbus, and plant space is being sought there.

CLEVELAND — Boehm Pressed Steel Co., 2219 West Sixty-third street, is building its second addition, providing light machine shop and storage space, 32 x 113 feet. Joseph J. Boehm is president. Boldt-Rapp Co., 2175 Ashland avenue, is contractor.

MARTINS FERRY, O. — City, Walter Lipphardt, service director, William L. Wilson, clerk, city hall, has retained Rust Engineering Co., Clark building,

Pittsburgh, to make survey for municipal electric power and light plant, estimated to cost about \$250,000.

Connecticut

EAST HARTFORD, CONN.—Hamilton Standard Propeller division United Aircraft Corp., 400 Main street, will take bids soon through Albert Kahn Inc., 345 New Center building, Detroit, for a plant extension 70 x 610 feet.

EAST HARTFORD, CONN.—Pratt & Whitney Aircraft division United Aircraft Corp., 400 Main street, has given general contract to Turner Construction

■Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 94 and Reinforcing Bars Pending on page 97 of this issue.

Co., 420 Lexington avenue, New York, for a plant addition. Albert Kahn Inc., 345 New Center building, Detroit, is architect.

WEST HARTFORD, CONN.—Jacobs Mfg. Co., 2074 Park street, Hartford, has given general contract to Robert G. Bent Co., 93 Edward street, Hartford, for a plant addition costing over \$40,000. Albert Kahn Inc., 345 New Center building, Detroit, is engineer.

Massachusetts

FALL RIVER, MASS.—Public works department, city hall, has had plans prepared by E. M. Corbett, 49 Purchase street, for an airport, hangars, shop, administration building and other structures, to cost \$650,000.

WILLIAMSTOWN, MASS.—Gevaert Co. of America, 182 Cole avenue, will let contract soon for a three-story plant 61 x 92 feet, costing about \$60,000. W. E. Versluys, 182 Cole avenue, is engineer.

WRENTHAM, MASS.—Winter Bros. Co., Minot street, will award contract soon for a one-story addition 65 x 112 feet, costing about \$40,000. F. B. Mitchell, Foxboro, Mass., is engineer.

New York

BUFFALO, N. Y.—Buffalo Foundry & Machine Co., H. H. Miles, president, Fillmore avenue, will build a shop 40 x 170 feet, costing \$40,000. General contract has been awarded to Crooker, Carpenter

SHENANGO-PENN

INGOT



MOLDS

STOOLS

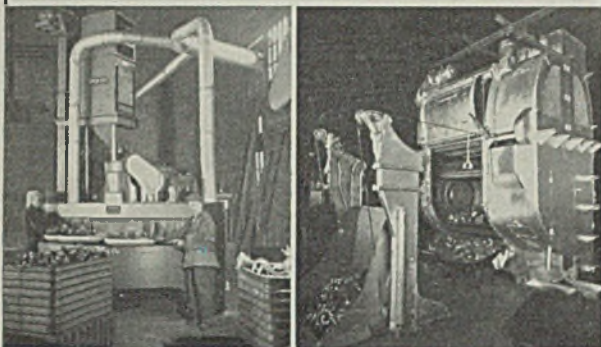
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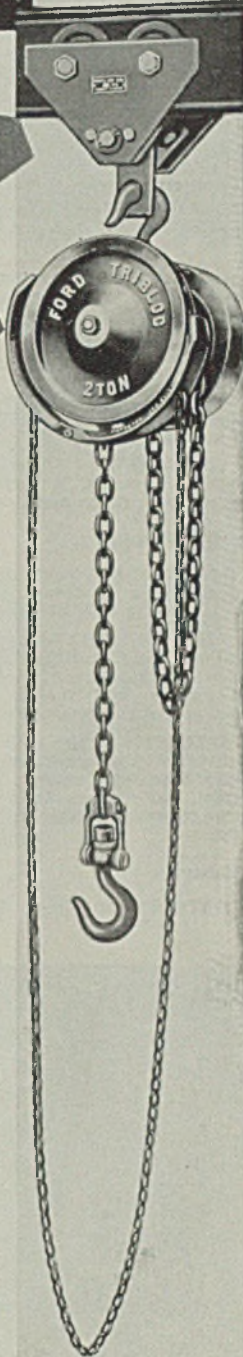
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GASPORT, N. Y.—City will install water system, including wells, tanks, pumps and mains, costing about \$200,000. C. Post, Old Postoffice building, Albany, N. Y., chief engineer. WPA project.

LOCKPORT, N. Y.—Harrison Radiator Corp., F. M. Hardman in charge, has given general contract to John W. Cowper Co. Inc., Sidway building, Buffalo, for a one-story plant addition 240 x 360 feet, costing about \$260,000. (Noted July 22.)

New Jersey

BOUND BROOK, N. J.—Bakelite Corp., 247 Park avenue, New York, has let general contract to M. D. Pederson & Sons, 280 Hobart road, Perth Amboy, N. J., for a 2½-story 80 x 260-foot manufacturing and laboratory building on River road. W. H. Ahlbeck, River road, is engineer.

NEW BRUNSWICK, N. J.—Johnson & Johnson, 500 Fifth avenue, New York, will take bids soon on 102 x 202-foot laboratory and 141 x 238-foot industrial tape plant. R. G. & W. M. Cory, 30 Church street, New York, are architects.

TRENTON, N. J.—Trenton Transit Co., 132 Perry street, is having plans prepared for a large machine shop.

Pennsylvania

MEDIA, PA.—Wallingford Water Co. is improving its lines and extending fire protection at cost of about \$34,000.

PHILADELPHIA—Gascolgne & Associates, Leader building, Cleveland, have been retained as consulting engineers to survey and report on the city's sewage treatment problem.

TITUSVILLE, PA.—Cyclops division, Universal Cyclops Steel Corp., R. C. Bovard, works manager, 701 East Spring street, has revised plans for a one-story storage and pickling building, 50 x 100 feet.

Michigan

DETROIT—Michigan Tool Co., 7171

East McNichols road, has let general contract to Krieghoff Co., 6661 French road, for a two-story plant, 101 x 195 feet, to cost about \$75,000. (Noted July 29.)

MONROE, MICH.—Monroe Auto Equipment Co. has let general contract to H. G. Christman-Lansing Co., 408 Kalamazoo plaza, Lansing, Mich., for a one-story 177 x 245-foot manufacturing plant. (Noted July 29.)

Illinois

BATAVIA, ILL.—Furnas Electric Co., West Allis, Wis., manufacturer of electric controls for motors and similar devices has started construction of a one-story plant 50 x 300 feet here.

ROCKFORD, ILL.—Sundstrand Machine Tool Co. has given general contract to Linden & Sons Inc. for a two-story plant addition 64 x 64 feet. Gilbert A. Johnson, Swedish-American Bank building, is architect.

Indiana

HAMMOND, IND.—LaSalle Steel Co., Hammond, has awarded general contract to Hughes Foulkrod, Schaff building, Philadelphia, for two plant additions, 80 x 104 and 96 x 100 feet.

Maryland

VIENNA, MD.—Eastern Shore Public Service Co., Sallsbury, Md., will let contract soon for a powerhouse 100 x 200 feet. Utilities Management Co., Washington street, Reading, Pa., is engineer.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids as follows: Aug. 27, schedule 2763, twenty-three motor-driven milling machines for Brooklyn and Philadelphia yards; Aug. 30, schedule 2772, motor-driven 21-inch upright drill for Sewalls Point, Va.; schedule 2773, self-contained pneumatic drop hammer for Sewalls Point, Va; schedule 2776, fourteen motor-driven heavy duty engine lathes for Norfolk, Va; Sept 3, schedule 2757, seven motor-driven table-type boring, drilling and milling machines for various points.

Kentucky

LOUISVILLE, KY.—Reynolds Metals Co., 2934 Grand street, plans an aluminum production plant in the Tennessee valley, site not selected. R.F.C. loan of \$15,800,000 will finance project.

South Carolina

PICKENS, S. C.—Singer Mfg. Co. has let general contract to Daniel Construction Co., Anderson, S. C., for a power plant to cost about \$150,000.

West Virginia

HUNTINGTON, W. VA.—United States engineer's office, F. H. Falkner, captain engineering corps, has plans ready for bids Sept. 10 for flood protection work, including four pumping stations and 12 pumps, gate wells, sewers and appurtenant works.

Virginia

RICHMOND, VA.—Virginia Electric & Power Co., Richmond, Va., and Virginia Public Service Co., Alexandria, Va., plan development of electric power facilities at Hampton Roads, Va., at cost of more than \$6,000,000. Includes 110,000-volt transmission line from Richmond to Newport News and a 40,000-kilowatt addition to generating plant in Norfolk, increasing capacity 50 per cent.

RICHMOND, VA.—Reynolds Metals Co. Inc., W. J. Waymack, manager, Seventh and Bainbridge streets, plans a plant extension to cost about \$75,000.

Missouri

MARYVILLE, MO.—Nodaway-Worth Electric co-operative, Lawrence Ruckman, Denver, Mo., president, will take bids soon for 412 miles transmission lines to serve 1075 customers. Paulette & Wilson, 1006 Kansas avenue, Topeka, Kans., is consulting engineer.

Oklahoma

CHEROKEE, OKLA.—Alfalfa Electric co-operative, Howard Crocker, manager, takes bids soon on 151 miles transmission lines to serve 300 customers, costing about \$107,000. C. H. Guernsey & Co., Cherokee, are consulting engineers.

CORDELL, OKLA.—Kiwask Electric co-operative, Ripley S. Greenshaw, manager, takes bids soon on 469 miles transmission lines to serve 950 customers. C. H. Guernsey & Co., Cherokee, Okla., are consulting engineers.

SAYRE, OKLA.—Norfolk Electric co-operative, John L. Klingman, superintendent, is taking bids on 127 miles of transmission lines to serve 318 customers. C. H. Guernsey & Co., Cherokee, Okla., are consulting engineers.

Wisconsin

BEAVER DAM, WIS.—Malleable Iron Range Co. is having plans made for a two-story factory addition 100 x 200 feet and improvements to present plant.

MEDFORD, WIS.—Medford Brewing Co., Frank Mohr, manager, has given general contract to Central Construction Co. for a one-story bottling plant 42 x 62 feet.

MILWAUKEE—Sunday Air Conditioning Co., 122 West Pittsburgh avenue, recently moved here from Detroit, will go into production shortly on refrigerating, air conditioning and heating unit for motor trucks. J. J. Sunday is president.

SAUKVILLE, WIS.—Village council, Herbert Schowalter, clerk, will open bids Aug. 23 for a steel water tank and tower and water distribution system. A. E.



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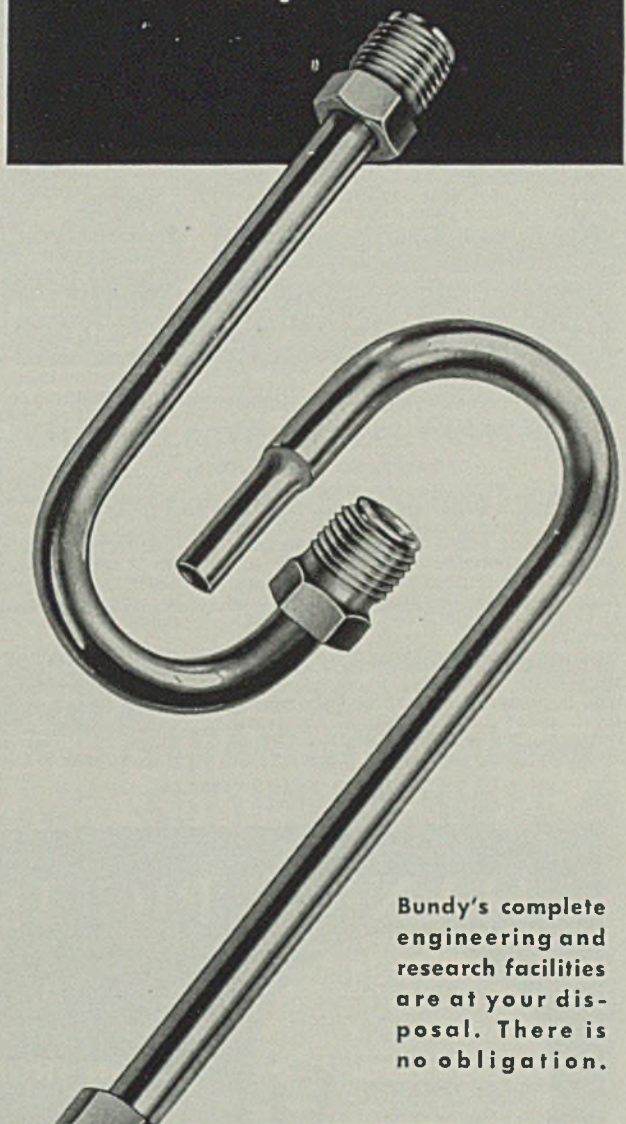
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—Construction and Enterprise—

McMahon Engineering Co., Menasha, Wis., is engineer.

STURGEON BAY, WIS.—Sturgeon Bay Shipbuilding & Dry Dock Co. will build an addition 40 x 60 feet, 38 feet high. G. J. Feldhausen, Green Bay, Wis., is architect.

Minnesota

HANSKA, MINN.—Village, Glenn M. Anderson, recorder, takes bids to Aug. 20 on 50,000-gallon steel tank on tower. Deuary & Milnowski, 1411 Pioneer building, St. Paul, are consulting engineers.

MINNEAPOLIS — Northern Pump Co. has given general contract to George F. Cook Construction Co., 2608 Nicolette avenue, for a one-story addition 153 x 340 feet for assembly department.

OWATONNA, MINN.—Owatonna public utility commission, W. J. McDonnell, secretary, will open bids Sept. 10 for a steam generating unit and auxiliary equipment. Pillsbury Engineering Co., 1200 Second avenue South, Minneapolis, is engineer.

RUSH CITY, MINN. — City will take bids soon for a municipal light and power plant, diesel engine and other equipment and distribution system, to cost about \$200,000. Harry L. Sherman is city clerk. Ralph D. Thomas & Associates, 1200 Second avenue South, Minneapolis, are engineers.

Texas

DALLAS, TEX.—Reserve Gas Pipe Line Co., J. Wallace Bostick, Dallas, has applied to federal power commission for certificate of public convenience and necessity authorizing a natural gas line 1500 miles long from Texas to New York. Estimated cost is \$80,000,000. Would serve Philadelphia, New Jersey and New York areas.

HOUSTON, TEX.—John Deere Plow Co., Moline, Ill., will have plans ready for bids in September for three-story implement plant on Navigation boulevard. David M. Duller, Second National Bank building, is engineer. J. A. Rabyor, 2107

Walker street, is the local manager.

Kansas

EMPORIA, KANS.—Lyon County Electric co-operative, M. E. Turkle, acting superintendent, will take bids soon on 190 miles transmission lines to serve 410 customers. C. H. Guernsey & Co., Cherokee, Okla., is consulting engineer.

SEABROOK, KANS.—Mission township, Topeka postoffice, R.F.D. No. 8, Jay Shideler, clerk, will take bids soon on 75,000-gallon steel tank on tower and water distribution system. O. J. Eidman, 638 New England building, Topeka, Kans., is consulting engineer.

SENECA, KANS. — Marshall-Nemaha electrification service, A. J. Wempe, Frankfort, Kans., president, has completed survey for 170 miles transmission lines. Paulette & Wilson, 1006 Kansas avenue, Topeka, Kans., are consulting engineers.

WASHINGTON, KANS.—REA has allotted \$148,000 to P.R.&W. Electric co-operative for 160 miles of transmission lines to serve 423 customers.

WELLINGTON, KANS.—Sumner-Cowley Electric Corp., C. L. Webber, manager, will take bids soon on 350 miles transmission lines to serve 670 customers. C. H. Guernsey & Co., Cherokee, Okla., are consulting engineers.

Iowa

ATLANTIC, IOWA—WPA has approved project for sewage disposal plant to cost about \$165,000.

CLINTON, IOWA—Clinton dock board, R. N. Howes, secretary, will open bids Sept. 3. for a locomotive crane of 20 to 25-ton capacity for the municipal river terminal.

CRESO, IOWA—Howard county electric co-operative, E. G. Skarshong, superintendent, has awarded contract to Aeme Construction Co., 317 Smith avenue, St. Paul, Minn., at \$206,105 for 357 miles rural transmission lines. K. R. Brown, 802 Valley Bank building, Des

Moines, Iowa, is consulting engineer.

DAVENPORT, IOWA — Red Jacket Pump Co., manufacturer of water pumps and similar lines, has awarded general contract to Priester Construction Co. for additions and improvements to plant.

FORT DODGE, IOWA — Horn Folding Partition Co., manufacturer of metal folding building partitions, has given general contract to C. E. Larson Construction Co. for two factory additions.

LAKE VIEW, IOWA—WPA has allocated \$13,600 to finance sewage disposal plant and sanitary sewers.

Nevada

PIOCHE, NEV.—Combined Metals Reduction Co., Salt Lake City, Utah, will build an ore treatment plant at Pioche with capacity of 450 tons per day, to treat lead-zinc ores, being produced at 10,000 tons per month.

California

BURBANK, CALIF.—Lockheed Aircraft Corp. will build an addition to the final assembly building with 65,000 square feet floor space; addition to engineering department 200 x 275 feet and a research laboratory.

LOS ANGELES—Gyro-Spheric Bearing Co. Inc. has been incorporated with 10,000 shares no par value by David B. McClelland, La Canada, Calif.; John A. Peterson, Pasadena, Calif.; Glenn H. Cutler, Pacific Southwest building, Pasadena, Calif.

LOS ANGELES — Aviation Parts Inc. has been incorporated with \$200,000 capital by William L. Freelove, Thomas R. Larkin and E. Linder, the latter of 311 South Spring street, Los Angeles.

TORRANCE, CALIF.—Torrance Aluminum Products Co., 1030 Engracia avenue, has been formed by Harvey Crawford and associates.

Washington

BELLINGHAM, WASH. — Berg Hard Metals Co., J. T. Pemberton in charge, has been incorporated by William E. Henley and associates, capital \$50,000, to manufacture and process minerals.

SEATTLE — Todd Seattle Dry Docks Inc. will build a warehouse, two stories, 37 x 160 feet at 2501 Sixteenth avenue S. W., general contract to General Construction Co., Seattle.

Canada

HALIFAX, N. S.—Department of public works, J. M. Somerville, secretary, has asked bids on a machine shop addition at H.M.C. dockyard here.

GUELPH, ONT.—Guelph Stove Co. Ltd., 490 York road, has let structural steel and concrete work on a plant addition, through Bennett Pratt Ltd., 30 Bloor street West, Toronto, general contractor. (Noted July 29.)

HAMILTON, ONT.—Canadian Westinghouse Co. Ltd. is taking bids through Hutton & Souter, architects, 36 James street, for a one-story plant addition 65 x 450 feet, on Aberdeen avenue, costing about \$75,000. D. P. Brown is engineer. (Noted Aug. 12.)

SARNIA, ONT.—Imperial Oil Ltd., 425 St. Christina street, has let general contract to Canadian Kellogg Co. Ltd., 650 St. Catharine street West, Montreal, for crude running and coke plant here, at cost of about \$1,500,000.

MONTREAL, QUE.—Canadian Vickers Ltd., 5136 Notre Dame street East, has let general contract to James W. Ross, 1010 St. Catharine street West, for an aircraft plant, one story, 210 x 220 feet.

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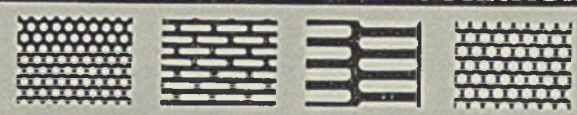
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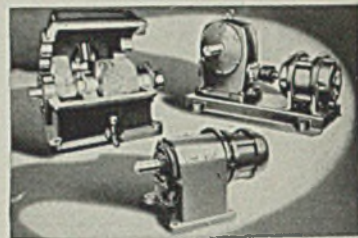
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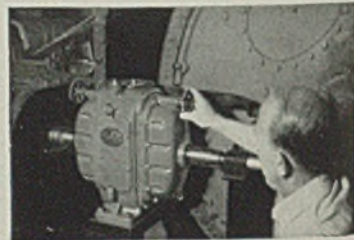
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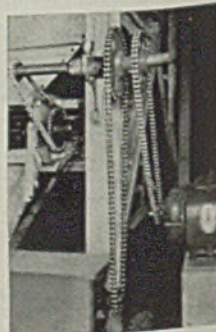
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