May 1942

TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office

COLOR FOR RUBIES . . .
BACKBONE FOR STEEL!

Chromium, the element that imparts precious color to rubies, imparts something more precious to steel. It gives steel incredible hardness and resistance to heat and corrosion. It makes steel strong, yet ductile and shock-resistant.

Chromium is the key that has opened — and is still opening — great new fields of application for steel. Without chromium, the whole wonderful series of *stainless steels* would not have been possible. From tarnish-free tableware to corrosion-resistant chemical equipment . . . from strong, lightweight truck bodies to streamlined trains and airplanes . . . from heat-defiant boiler tubes to high-temperature steam turbines . . . chromium has made possible a *steel* with properties of the *noble metals.*

But the stainless steels are only one great contribution of chromium. This element has also helped to provide hard, shock-resistant armor plate and armor-piercing projectiles; long-wearing engine valves; strong, tough gears, tools, ball bearings, car trucks, shafts, springs, and dies; and hundreds of other improved articles.

We do not make steel of any kind. But for over 35 years, we have made ferro-alloys and alloying metals used in steel-making. Among these are chromium, silicon, manganese, vanadium, tungsten, zirconium, columbium, and calcium.

It was our research and development that made the low-carbon grades of ferro-chromium available commercially. Without these, production of a majority of the stainless steels would have been impracticable. Inquiries about stainless and other alloy steels — their manufacture, fabrication, and use — are cordially invited.

The progress made by Electro Metallurgical Company in the manufacture and use of ferro-alloys and in the development of alloy steels has been greatly facilitated by metallurgical research in the laboratories of Electro Metallurgical Company and Union Carbide Company; by the advances in electric furnace electrodes and techniques of National Carbon Company, Inc.; and by the broad experience in the production, fabrication, and treatment of metals of Haynes Stellite Company and The Linde Air Products Company. All of these companies are Units of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation

30 EAST 42ND STREET UCC NEW YORK, N. Y.

THE TECHNOLOGY REVIEW, May, 1942. Vol. XLIV, No. 7. Published monthly from November to July inclusive at 10 Ferry Street, Concord, N. H. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription $3.50; Canadian and Foreign subscription $4.00. Entered as second-class matter at the Post Office at Concord, N. H., under the Act of March 3, 1879.

THE TABULAR VIEW

Bounce. — Various activities having to do with the surface of the sea have in the past been reported for The Review by RICHARD HALLET, who in this issue writes with compelling zest of matters far beneath that gleaming plane. His description (page 311) of the methods employed by oceanographers for determining depth and the condition of the unseen bottom summarizes another way in which science has advanced over the rough-and-ready techniques of an older day.

Balm. — Beauty to delight the eye and strength to reassure the mind are best secured from wood when it has been cut into veneers and bonded to form plywood for the construction of household furnishings, playthings, and a myriad other peaceful devices. So reasons THOMAS D. PERRY, '00, who in this Review (page 313) continues in the nonmilitary field his survey of modern applications of the material, which he began in our issue for December. Mr. Perry is sales and development engineer for the Resinous Products and Chemical Company.

Boom. — Drawing further on the Gaffield collection in the Institute Library, STERLING LANIER recounts for The Review (page 316) the heyday of Massachusetts' Nineteenth Century ventures in glassmaking. The middle portion of that century saw a boom atmosphere in the industry, a cross section of which fills many pages in the unique records available at Technology. Mr. Lanier, an instructor in English at the Institute, has sifted from the material an informative discussion of a little-known portion of industrial history.

Base. — Staff member by turns of both *The Tech* and the *Tech Engineering News*, MILTON B. DOBRIN, '36, as an undergraduate at Technology was an able journalist, a rating which he has augmented in years since. A geophysicist with the Gulf Research and Development Company, he discusses in this Review (page 319) methods by which geophysical detectives have been progressing toward comprehension of the hidden materials on which is based the superficial earth that is the limit of most men's knowledge. As it has at present developed, the inquiry which Mr. Dobrin ably depicts is an excellent example of pure research done for the advancement of knowledge.

Boat. — From BERTRAND R. T. COLLINS, '88, comes an interesting reminiscent account (page 325) of how Technology men traveled to the first Chicago world's fair, now nearly half a century ago. Mr. Collins, who is secretary of his Class, was the moving spirit in the chartering of a steamer for the trip which he describes.

Brute. — It would take quite a Don Quixote to tilt at what is probably the world's biggest windmill, pictured on our cover. This is the Smith-Putnam wind turbine for the generation of electricity. The Review for December, 1940, recounted the participation of Technology men in the design and construction of the device on Grandpa's Knob in Vermont.

The Country Club's new tractor is protecting the Panama Canal

If the fairways of the Country Club are a little rough in spots, members can add a stroke or two and blame it on the Japs. For the materials to produce the new tractor that was going to pull the club's gang of lawn mowers are now in a tractor somewhere in Panama, hauling a heavy gun. Either there or on our farm lands, helping a farmer grow bigger crops. Between them, Private Brown and Farmer Brown get all the new tractors there are.

In this war of blitz and counter-blitz, big guns must have the mobility of tanks. That means a tractor for every heavy gun. Add to these the thousands of tractors our farmers must have, and it is easy to see why the tractor manufacturers must strain every resource to fill the need.

In doing so, they smoothed out important production tasks in cooperation with the Revere Technical Advisory staff. For in all problems of copper and its alloys Revere provides a service, as well as metals, that can make manufacturing operations quicker and easier.

Every ounce of copper and brass our country can produce is needed to win the war. None can be spared for any other use. But Revere is especially well equipped with new plants, improved machines, advanced processes to supply a heavy share of these vital metals. And more facilities are rapidly being added to help get the war won *soon*.

The Revere Technical Advisory Service functions in (1) developing new and better Revere materials to meet active or anticipated demands; (2) supplying specific and detailed knowledge of the properties of engineering and construction materials; (3) continuously observing developments of science and engineering for their utilization in production methods and equipment; (4) helping industrial executives make use of data thus developed. This service is available to you, free.

REVERE COPPER AND BRASS INCORPORATED

EXECUTIVE OFFICES: 230 PARK AVENUE, NEW YORK

MAIL RETURNS

Question

FROM HAROLD K. FARR, '35:

The March issue of The Review contains on page 225 a picture captioned, "Lifting the slips out of the hole in the rotary table. Both pipe wrenches are on the drill-pipe couplings, ready to break out the joint." I should say that the slips were being lowered into place in the rotary table. If the drill pipe were uncoupled without the slips in place, it would fall to the bottom of the hole.

Cambridge, Mass.

Answer

FROM GILBERT W. NOBLE, '25:

Mr. Farr is correct as to the caption of the photograph used on page 225 in my article, "Wells of Power." I noticed this error when I first saw the article in print, but hoped that too many of the eagle-eyed readers would not catch it. The entire set of the drill pipe must at all times be supported, either by the elevators suspended from the hook or by the slips set in the rotary table. In the left-hand illustration on page 225, the caption is correct. The elevators are being latched below the coupling on the drill pipe. The weight of the stand of drill pipe was being entirely supported by the pipe slips at the time the picture was taken.

As soon as the elevators are raised by the hoist, the slips will disengage themselves and start to come out of the hole in the rotary table. The roughnecks catch them by the handles and set them back out of the way. You will notice that both sets of tongs have swung back out of the way of the pipe in the left-hand illustration. As the third coupling is raised above the rotary table, both sets of tongs are latched onto the couplings, one above and one below the threaded connection of the tool joint. Then after the roughnecks pick up the slips and set them into the hole in the rotary table, the driller disengages the hoist, holds the cable with the brake, and (by releasing the brake) slowly lowers the string of pipe until the slips take hold of it. At this stage, the entire weight of the drill pipe, including the three joints above the slips, is suspended from the rotary table.

Of course, the operation of lowering the slips to transfer the weight of the pipe to the rotary table and the operation of lifting the slips as the pipe is being raised will appear to the camera exactly the same, but having both sets of tongs on the pipe proves that the slips are being lowered preparatory to breaking out the joint.

Rolla, Mo.

MOLYBDENUM ENLISTS FOR THE DURATION

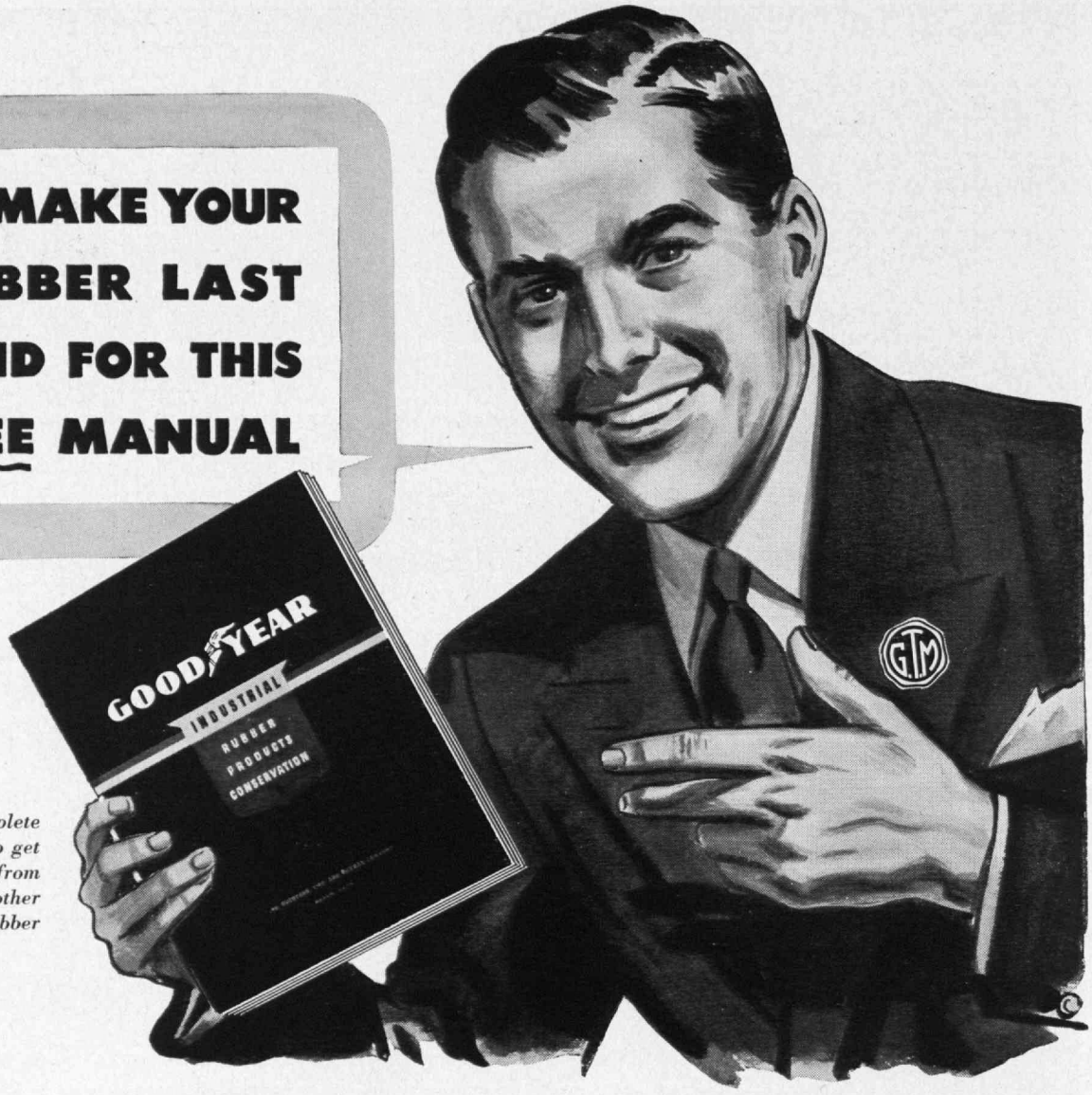
The enormous increase in requirements of molybdenum has necessitated the War Production Board Order M-110, placing molybdenum consumption under allocation control...Our metallurgical research staff is fully engaged in war work. At our mine, mill and converting plant, every effort is being made towards maximum production.

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

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

MOLY

TO MAKE YOUR RUBBER LAST SEND FOR THIS FREE MANUAL



—contains complete data on how to get longer wear from belts, hose and other mechanical rubber goods.

EVERY user of rubber will want this new Goodyear Industrial Rubber Products Conservation manual. It tells you how to prolong the life of your present rubber installations—how to prevent premature failures that cause the needless waste of millions of pounds of rubber every year.

It's authoritative because it is written by the G.T.M. —Goodyear Technical Man—industry's consultant on all major rubber problems. It's complete, filled with practical suggestions and diagrams covering installation, inspection, maintenance, correction of abuses, and instructions for proper repair. It's essential, even if you hold a priority, *because there's no telling what further restrictions may be put on rubber!*

Remember, improper application and maintenance can reduce the life of rubber products by as much as 50%. This manual will enable you to recognize and correct all such cases now — help you save rubber and save money. To get your free copy mail the coupon below—today.

THE GREATEST NAME IN RUBBER

GOODYEAR
MECHANICAL GOODS

DO IT NOW

GOODYEAR, AKRON, OHIO
Dept. B-15

Kindly send me free copy of "Goodyear Industrial Rubber Products Conservation."

Name_____

Firm name_____

Address_____

City_____ State_____

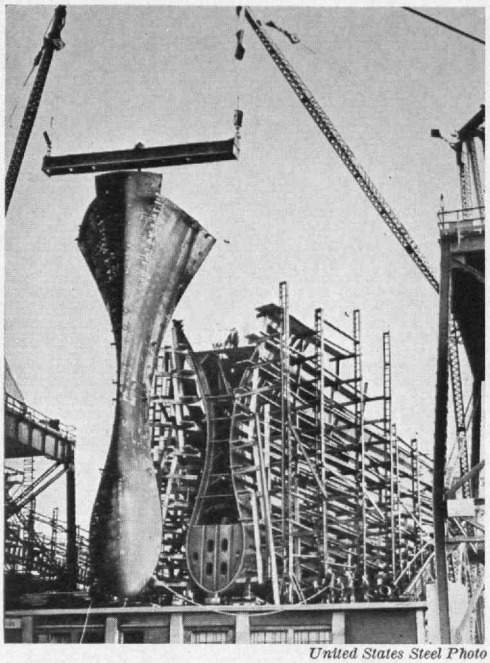
VOLUME 44 NUMBER 7

THE TECHNOLOGY REVIEW

TITLE REGISTERED U. S. PATENT OFFICE

EDITED

AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY



United States Steel Photo

The welded bow section of a tanker is swung into place on a shipway. Shop assembly of large hull units speeds emergency ship production.

CONTENTS for MAY, 1942

☆ ☆ ☆

Published monthly from November to July inclusive on the twenty-seventh of the month preceding the date of issue, at 50 cents a copy. Annual subscription, $3.50; Canadian and foreign subscription, $4.00. Published for the Alumni Association of the M.I.T.: B. Edwin Hutchinson, President; John E. Burchard, Harold Bugbee, Vice-Presidents; Charles E Locke, Secretary; Ralph T. Jope, Treasurer. Published at the Rumford Press, 10 Ferry Street, Concord, N. H. Editorial Office, Room 3–219, Massachusetts Institute of Technology, Cambridge, Mass. Entered as second-class mail matter at the post office at Concord, N. H. Copyright, 1942, by the Alumni Association of the Massachusetts Institute of Technology. Three weeks must be allowed to effect changes of address, for which both old and new addresses should be given.

Leppert from Black Star

TEMPLE

. . . of Corinthian design in the formal Greek garden on the estate of the late Samuel Untermyer