

*May* 1942

# TECHNOLOGY REVIEW

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## 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*.

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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.*

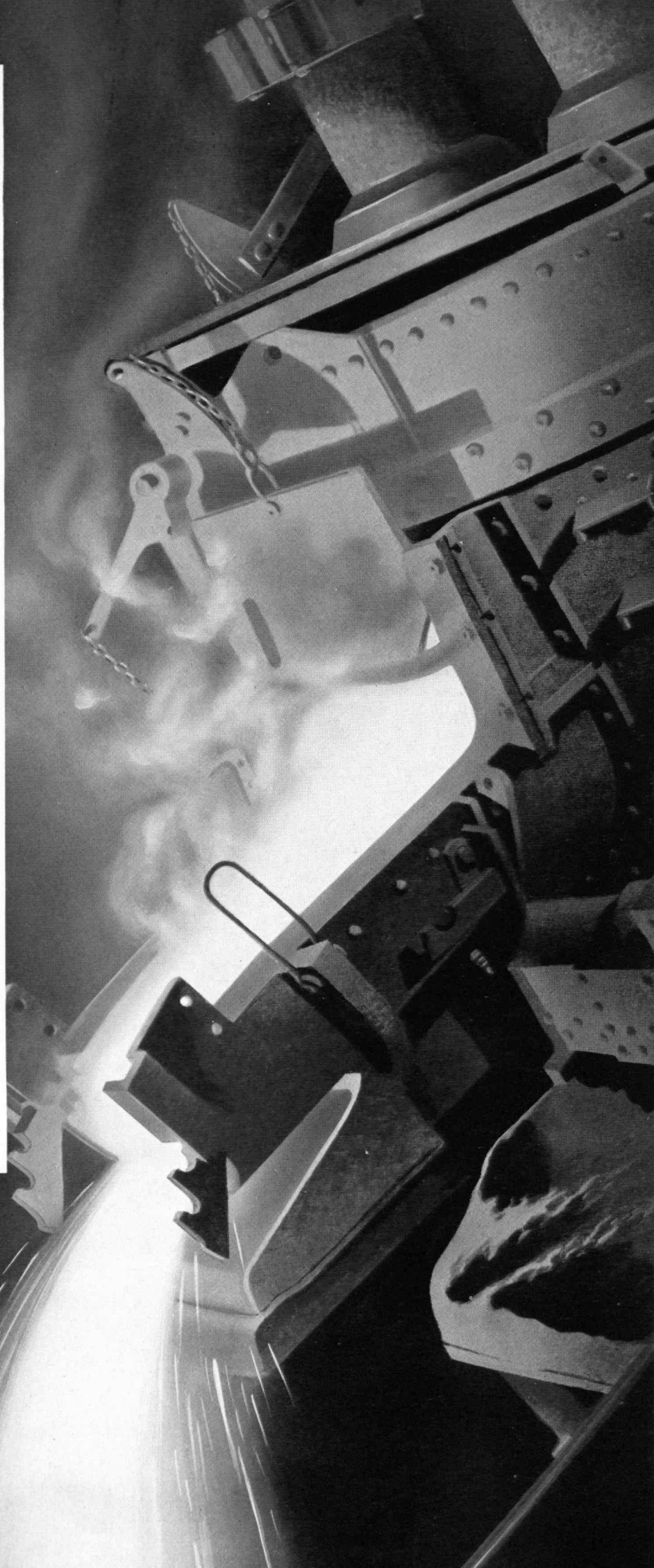
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*Just for Fun!*  
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 TO YOUR INGENUITY

WE wish to thank Mr. E. R. Morton, of Brooklyn, N. Y., for sending us the following original puzzle, which we believe you will find interesting.



In building a model, a man found that he needed a 2:1 gear ratio. He had on hand only six equal gears (like those shown above), yet he was able to obtain the desired ratio, using full tooth conventional meshing. How?

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## 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 trac-

tor 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.

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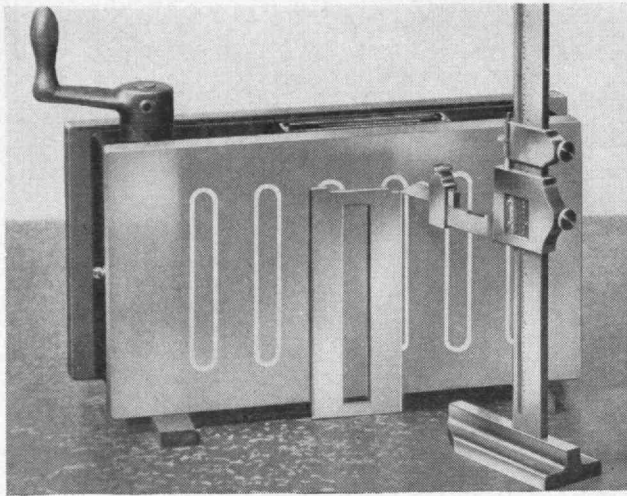


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**MAIL RETURNS**

*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.

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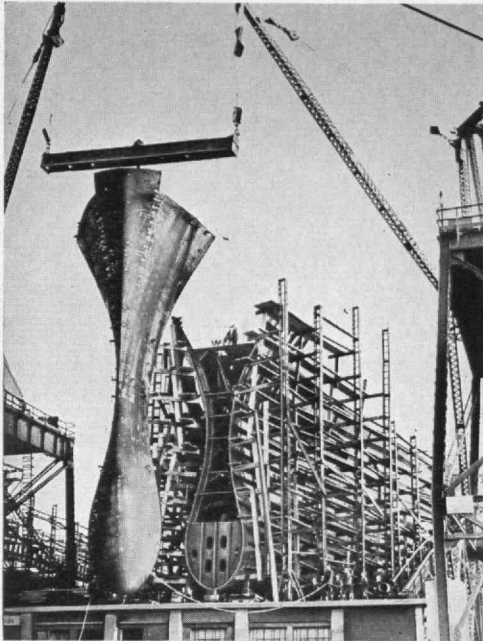
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United States Steel Photo

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

VOLUME 44

NUMBER 7

# THE TECHNOLOGY REVIEW

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From a photograph by William M. Rittase

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*Leppert from Black Star*

# TEMPLE

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