

## MILITARY SCIENCE

**Gadget Turns Any Fencepost Into Machine Gun Mount**

► TWO ARMY NONCOMS, Cpl. D. L. Hoover and Cpl. V. Ciaccarini, have invented a gadget that converts any fencepost or tree stump into an anti-aircraft mount for the .50-caliber machine gun, the weapon most feared by low-flying strafing planes. It can be secured in less than half a minute, onto any piece of timber between three inches and two feet in diameter. The device is described in detail by Capt. Byron R. Rampton, F.A., in the *Field Artillery Journal* (September).

Basis of the mount is a one-foot piece of four-inch angle iron, with two short pieces of chain attached near either end in such a way that they can be snugged up tight by turning a pair of wing nuts. These clamp the device to the post.

Across one end of the angle iron a circular plate is welded, with a groove that receives a flange projecting from a second, freely rotating plate; the two are pivoted on a bolt that passes through their centers. On top of the second plate a pair of forked arms are welded, and these serve as supports for the gun.

The entire mount is only 18 inches long and weighs about 25 pounds, so that it offers no difficulties in transportation.

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## ASTRONOMY

**Comet Reported by Finn May Actually be Asteroid**

► THE COMET reported earlier this year by Miss L. Oterma, Finnish woman astronomer of Turku Observatory, may actually be an asteroid, according to a report received at the Harvard Observatory, American clearing house for astronomical reports.

A preliminary investigation of the elements of the comet, made by George H. Herbig and Miss Delia McMullin of the Department of Astronomy at the University of California at Los Angeles, showed that the eccentricity appears to group this object with the asteroids rather than the comets.

The stellar object in this case may be one of the multitude of minor planets revolving between the orbits of Mars and Jupiter and shining entirely by reflected light, instead of belonging to the highly eccentric comets which shine partly by reflected light and partly by light of their own.

"Attention should be called to the resemblance between Comet 1943a and Minor Planet 334 (Chicago)," points out Dr. Herrick, acting chairman of the Department of Astronomy of U.C.L.A. "If the two objects are identical," he adds, "the eccentricity of the minor planet has again passed through O, as it did before the conjunction of 1894."

The Oterma Comet was first seen on April 8 in the constellation of Virgo. It is not bright enough to be seen without the aid of a telescope, the magnitude remaining about 16.3. Miss Oterma is credited with discovering two comets last year.

These elements are essentially the same as those obtained first by L. E. Cunningham, and R. N. Thomas, and reported to Harvard Observatory.

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## RESOURCES

**Divi-Divi Tree Furnishes Leather Tanning Material**

► DIVI-DIVI does not have a tannin sound but the divi-divi tree of tropical America grows a divi-divi pod from which divi-divi tannin is extracted to produce a particular finish in American leathers. Larger amounts are now imported into the United States than in pre-war days because of shortages of other tannins which formerly came from war-infested countries.

The divi-divi tree is found in the islands in the Caribbean and in Colombia, Venezuela, Brazil, Mexico and other Latin American tropical countries. Botanically it is known as *Caesalpinia coriaria*. Extracts from its pods are used for dyeing as well as for tanning. The name divi-divi appears to be of native origin.

The dark brown pods of the divi-divi are from 1½ to 2½ inches long, and when chemically analyzed are found to contain up to 50% tannin. The tannin is extracted by dissolving it out with hot water after the pods have been disintegrated. When leather is tanned with divi-divi alone it takes on a yellowish color.

Most commercial divi-divi tannin is obtained from wild trees. A few cultivated orchards exist, however, and the pods from these are reported to contain a higher percentage of tannin than the wild pods. An orchard tree at eight years of age will produce from 150 to 300 pounds of pods if cultivated under favorable conditions of soil, moisture and climate. It thrives in hot lowlands with a minimum amount of rainfall.

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**IN SCIENCE**

## ENGINEERING

**Gas-Operated Unit Will Heat, Cool Post-War Homes**

► NEW gas-operated air conditioning units that will combine winter heating, summer cooling and humidity adjustment for post-war homes and small business places have been developed by Ser-vel, Inc.

Developed after nine years' research, 300 pre-Pearl Harbor test installations are now under observation in all kinds of climates.

For heating, the unit generates steam at ordinary boiling-point (212 degrees Fahrenheit). This flows to a blast type heating coil. A fan draws air over the coil and the steam condenses as the air is heated for circulation through the home.

For air cooling during the summer months, an absorption refrigeration cycle is used, containing lithium bromide solution as the solvent and water as the refrigerant.

In an enclosed high vacuum apparatus, the lithium bromide solution absorbs water vapor in the lowest pressure region of the system, creating a still lower pressure. This causes more water to vaporize resulting in a cooling effect.

To complete the cycle, steam from the exterior generator provides heat to separate the absorbed water from the lithium bromide solution.

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## ENGINEERING

**Electronic Method Used To Regulate Motor Speed**

► AN IMPROVED electronic control for direct-current motors was described to the American Institute of Electrical Engineers, meeting in Salt Lake City, by K. P. Puchlowski of the Westinghouse Electric and Manufacturing Company, East Pittsburgh.

The device is a "package unit," complete in itself, operated on ordinary alternating current from a remote pushbutton station. All rotating parts are eliminated except in the motor.

The control automatically speeds up the motor, slows it down, or puts it in reverse. Full driving force, or torque, is achieved even at low speeds.

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# CE FIELDS

## MEDICINE

### Polish Medical Center Prepared to Go to Poland

► THE POLISH Medical Center in Scotland is prepared to move its staff and equipment to Poland the minute peace is declared. In this manner Poland may once again become the health frontier for post-war Europe.

The double objective of the center is relief to suffering Poles who can be reached today and constant training for Poles in Scotland for the immense relief job to begin the day Poland is free.

Scots, Poles and Americans are cooperating to make the Paderewski Polish Hospital and Polish Medical School of Edinburgh University possible. A number of graduates of the medical school are already interning in the hospital.

The idea of the center was originated by Dr. Anthony Jurasz, formerly professor of surgery and dean of the medical faculty at the University of Poznan. Polish specialists in various branches of medicine and surgery have been attracted to the center. The 200-bed hospital has such specialized equipment as a pathological laboratory and X-ray tuberculosis research ambulance.

The Paderewski Testimonial Fund, Inc., of which Mrs. Vernon Kellogg of New York City and California is chairman, is arousing interest in this center in the United States.

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## ASTRONOMY

### Red Stars Found Imbedded In Titanium Oxide Gas

► A LARGE number of red stars, of the peculiar M type, are imbedded in atmosphere of titanium oxide gas, reports Dr. Oliver J. Lee, director of Dearborn Observatory of Northwestern University, who has studied the heavens during the past 12 years with the assistance of Ralph B. Baldwin, David W. Hamlin, and Richard F. Kinnaird. Approximately 85% of these red stars listed in Volume V of the *Annals of Dearborn Observatory* are relatively faint and have not previously been analyzed.

The M type stars are peculiar in that they are more numerous proportionally

in the direction of the constellations Scorpio and Sagittarius, the center of our galactic system. This is in marked contrast, reports Dr. Lee, to stars of the R and N type which are surrounded by an envelop of gaseous carbon, for they cluster notably in the opposite part of the sky in the direction of the constellation Orion.

"In view of the oft-repeated statement that a large proportion of advanced M stars are variable, it was reasonable to expect that a considerable number of new long-period variables would be found," Dr. Lee relates. "We did not find half a dozen, although it would have been easy to detect a change of one or two magnitudes in brightness."

The study which Dr. Lee and his assistants have been making is hoped to throw light on the problem of how stars are born and what becomes of them when their internal energies have exhausted themselves. Observations of faint red stars will continue at Dearborn Observatory, and Dr. Lee hopes eventually to complete a spectrographic survey of the whole sky, classifying all faint red stars up to a magnitude of 11.5.

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## METALLURGY

### Corundum, Produced in U. S. First Time Since Last War

► CORUNDUM, a natural alumina abrasive used in manufacturing grinding wheels for tools and lenses, is now being mined again in the United States for the first time since the last war, the War Production Board states. The mining operations are carried on in South Carolina.

American needs for this important abrasive material have been met in the past years by importation from South Africa. A large plant for the treatment of boulder corundum is located at Pietersburg in Northern Transvaal. Corundum is reported to be widely distributed in the State of Musore, India. Little use of the Indian supply is reported.

Corundum, after mining, is crushed and sized. The coarse-grain products are sold to manufacturers of grinding wheels and the fine products to optical lens grinders. The fine dust after use by optical instrument workers is sold to retail opticians.

In 1940 the United States imported nearly 6,000 tons of corundum. The South Carolina mineral closely approximates the African product.

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## EDUCATION

### New Teaching Trend Opposed by Chemical Group

► "WAR is action, then let us train for action by continuing laboratory work in the high school curriculum," the American Chemical Society's committee on high school chemistry urges in a statement opposing what is called a nationwide trend to shift chemistry teaching from the laboratory to the classroom.

"This trend is definitely unscientific, and is detrimental to the training necessary for modern military, civilian, and industrial needs.

"Do not let the teacher do the experiments; he is not going to do the fighting. Put the chemicals and apparatus in the hands of the student; he is the one who will have to coordinate his hands, his eyes, and his mind at the battle front," the committee urges.

Withdrawal of many routine technicians from industry makes it increasingly important that the high schools provide opportunity and stimulus for turning out more chemists.

The committee is carrying out a nationwide program to adjust high school chemistry studies to demands of the armed forces and recommends increasing the number of class hours for fundamental science.

"Exclusion of fundamental chemistry is a misconception of the military wishes for pre-induction training," the committee warns.

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## CHEMISTRY

### Tinplating Speeded by Use of New Chemicals

► TINPLATING sheet metal for the manufacture of tin cans for food preservation and other purposes is now carried out by the use of new and improved chemicals, and electroplating processes which save much tin and speed production. The new chemicals make possible a continuous process for electroplating steel strips for containers.

By the use of the new high-speed continuous plating process, developed by the du Pont Company, 20,000-pound coils of steel sheet, 36 inches wide, are now being tin-coated at a rate of over 800 feet a minute. The process assures a uniform coating requiring from 40% to 65% less tin than is required in the older hot-dip method.

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