

## INVENTION

# G. I. Inventions

Machines that save valuable man-hours and eyesight have been contrived by soldiers overseas from scrap and junk piles.

► THREE SOLDIERS now serving in the European theater have proved, by their recent inventions, that one of the most deadly weapons in modern warfare is brainpower. Technical Sergeant Richard J. Schmieder, 26-year-old Ninth Air Force Service Command machinist, has developed new equipment that saves hundreds of man-hours in getting aircraft back into the air after suffering battle-damage. Master Sergeant Walter M. Bakula and Sergeant Everett R. Van Cleave, stationed in Italy, have designed and built efficient duplicating machines for cutting metal from plate steel and scrap metal, otherwise considered useless.

**FLAK PATCHES**—An electric drill points to two flak holes (left). The one to the lower left has already been drilled out with a soldier-invented 1¾-inch self-centering circular saw. A fly-cutter and jig (center) used for cutting out flak hole patches in standard sizes is another soldier-created time-saver in repairing B-26 Marauder medium bombers. Final step (right) is begun when the patch is held to the fuselage by retainers and the pattern of the patch is drilled into the aluminum. Rivets will be inserted, and a technically perfect job of mending will be completed. These are official Army Air Forces photographs.

Time is an essential commodity in getting flak-pocked, bullet-scarred, battle-damaged B-26 Marauders back into the sky, so that they can continue to hammer at Nazi installations along the Normandy invasion coast. Each plane must be mended, in conformation with rigid Army Air Force specifications, before it can again take to the sky.

Sgt. Schmieder developed a circular saw that is operated by a mechanical hand drill, which performs an inspection-proof job of patching a flak hole in five minutes. By hand, the job takes over an hour. He merely selects a self-centering saw of sufficient diameter to exceed each flak-hole's greatest extremity, inserts the tip in the puncture and cuts out a clean, round, even aperture, just as you might core an apple. From an assortment of prefabricated aluminum patches, in dimensions to fit every saw-cut, he chooses the proper size, and rivets it fast.

Recently, battle tests indicated that it was necessary to install grillework in the engine nacelle doors of the B-26 Marauders to allow air to circulate within the cowl and let toxic fumes escape. New planes coming from the factory were equipped with this modification, but it had to be made on those already in the field. By hand, the job took two full man-days to each plane. Sgt. Schmieder constructed a punch press from scrap materials that does the

job in 60 seconds—just one minute.

His other original developments include a long-handled torque wrench for dismounting and detaching engines from planes, a lord-mount jig, a broken spark plug remover, and a micromatic gun-sight hair scribe. For his job as a "fixer," Sgt. Schmieder received the Legion of Merit by order of Gen. Eisenhower.

The duplicating machines, developed by M. Sgt. Bakula and Sgt. Van Cleave, were constructed by them from a junk pile and a torch. One machine cuts a prescribed straight line, another cuts a circle, using an automatic cutting torch.

Their method saves the eyes of the operator from the constant strain of cutting with a hand torch, and speeds up the job, since the cutting is done at maximum speed throughout the operation. A job requiring 10 or 20 minutes of hard labor with a hand torch is accomplished by the new machine in five minutes. The smooth, even cut produced by the machine cannot be equalled by the steadiest hand.

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## PUBLIC HEALTH

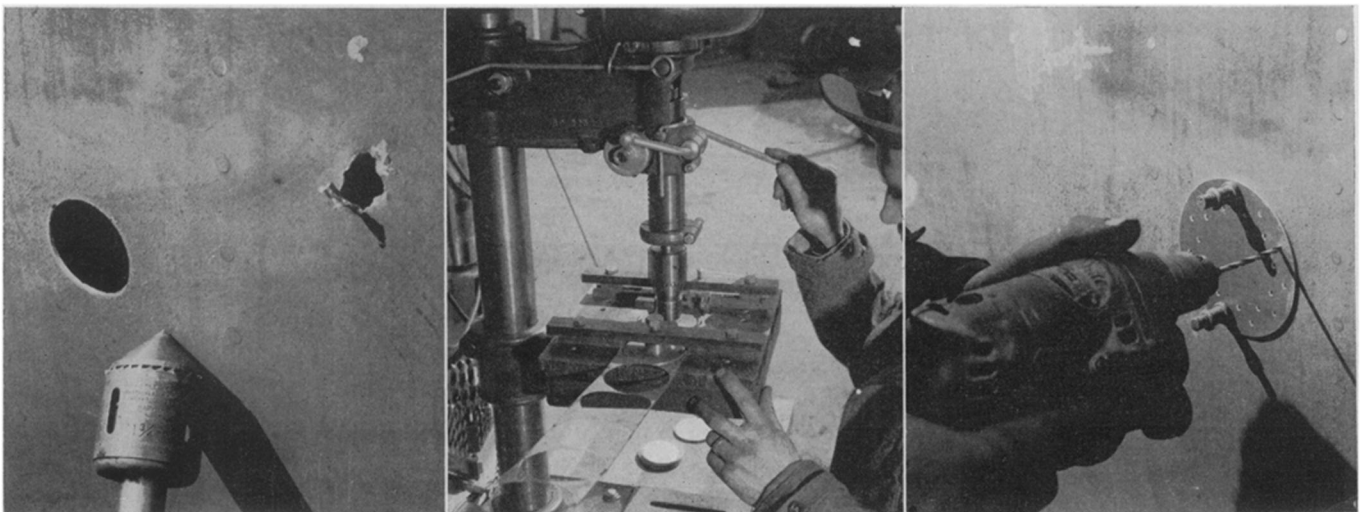
## Sylvatic Plague Reaches As Far East as Oklahoma

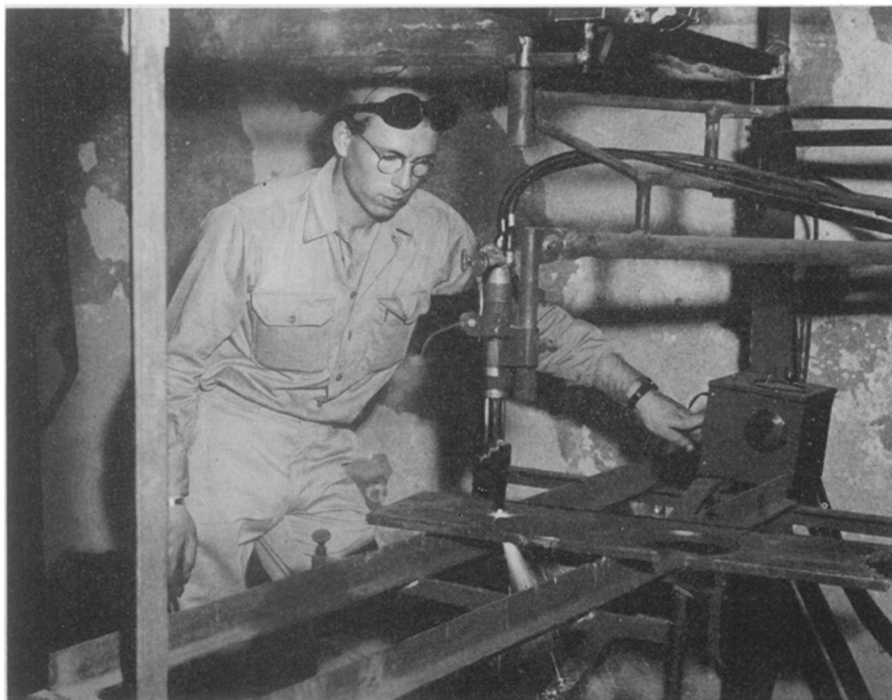
► SYLVATIC PLAGUE, the form of this dreaded disease found in wild rodents, has penetrated to Oklahoma where plague germs were found in fleas from wood rats and mice, the U. S. Public Health Service in Washington reports.

Oklahoma is the farthest east this disease has travelled so far in its spread from the West Coast.

No human case has been reported so far this year.

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**ACETYLENE CUTTING MACHINE**—Sergeant Everett R. Van Cleave turns on the power to put his newly invented machine into action in this official Army Air Forces photograph. It follows any pre-determined pattern, and the edge of the material is perfectly smooth after it has been cut.

## PHYSICS

## Fabric Measured by Sound

Elasticity of fabric thread is determined by causing it to vibrate like a string of a violin. Method is not new, but developments have made it commercially usable.

► CAUSING fabric thread to vibrate like a string of the violin with sound waves passing through it, is the basis of a method for determining its elasticity, a property important particularly to manufacturers of girdles, garters and garments that must possess stretchability. The method is not entirely new, but recent developments make it now commercially usable. They result from the work of two scientists of E. I. du Pont de Nemours and Company, Dr. J. W. Ballou and Dr. Shirleigh Silverman.

The elasticity of the thread or yarn must be taken into consideration in adjusting the loom or knitting machine before fabrication is started. The older stretching-by-weight method often produces permanent deformation. The new method does not, because in it a small force is applied rapidly and stretches the material so little and so quickly that it does not have time to get out of shape.

It is the sound waves passing rapidly through the material that cause the rapid stretching and recovery as the thread or yarn vibrates.

In the new method the test fiber is fastened to one end of a steel bar about eight inches long. The other end is strung over a pulley and held taut with a weight. A radio tube audio oscillator is turned on and sets up vibrations in the steel bar at the ten-kilocycle frequency (10,000 cycles per second), causing the bar to give out a very high note. The sound energy passes along the test fiber and causes it to vibrate. The wavelength of these vibrations is accurately measured with a sliding crystal. From the wavelength and the frequency, which is already known, the velocity of the sound is calculated. By what physicists call Young's modulus of elasticity, the elasticity then becomes known.

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## MEDICINE

## Army Uses Benzedrine Only When Necessary

► YOU NEED not worry that your man in the service who may be given a "benzedrine alert" to ward off a "sleep crisis" is in danger of nervous breakdown from overdosage. As explained by Maj. Gen. David N. W. Grant, the Air Surgeon, in a recent report to *Air Force*, official service journal of the U. S. Army Air Forces, distribution of benzedrine is in the hands of the medical officers.

These officers issue only the amount of benzedrine required in a particular situation, issue it only when absolutely necessary, and see to it that the men get a long enough sleep after a "benzedrine alert" to relieve completely the accumulated fatigue.

These medical officers know that benzedrine is no substitute for sleep and rest. The fact should be remembered by the lay person, young or old, who may be tempted to take the drug so he can stay awake to cram for an examination or to crowd into an already full day a few more hours of social or business activities.

"In time of war," General Grant states, "combat conditions frequently require men to remain on active duty long after the desire for sleep tends to overpower the demand for wakefulness.

"The importance of the 'sleep crisis' may be appreciated if one remembers that military success depends not only upon the arrival of enough men and equipment at the right place at the right time, but also upon their continuation in action the right length of time. To win a battle, in other words, striking power must be supported by staying power."

Ideally, staying power is obtained by replacement of tired men with rested reserves. This is not always possible and at such times it is better to give the men a "benzedrine alert" than to risk losing not only the battle but the men themselves.

"One pill may be worth a B-17 and crew of 10 when the man who is flying it can no longer stay awake," General Grant points out.

Benzedrine, it should be understood, will not produce supermen and its practical value will be defeated if the men are denied proper rest after its use.

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