



**PINT-SIZED**—This fuze, holding its own five-tube radio sending and receiving set, explodes a projectile as soon as it comes close enough to a target to inflict damage.

## CHEMISTRY

## Gas Attacks Anticipated

Soldiers were equipped with the latest type of gas masks, protective coverings, protective ointment and special eyeshields.

➤ NO SERIOUS attempts were made by either the Nazis or the Japs to use gas against American troops during the war, but if they had, relatively little harm would probably have resulted because the American forces at all times, wherever located, were fully prepared for large-scale gas attacks. Details of protective methods adopted are now revealed by the Army Chemical Warfare Service.

Soldiers were equipped with the latest types of gas masks, protective coverings, protective ointment and special eyeshields. Decontamination companies of the Chemical Warfare Service were ready with vehicular and portable equipment to clear the way through contaminated areas by chemical neutralization or other scientific means.

Gas masks, perhaps, come first in the individual protective devices. They purify the air the wearers breathe and also protect eyes and faces. The canister is the gas mask's most important part if the

mask is properly fitted to the face. It is a metal container through which the wearer inhales. He exhales through an outlet valve near his mouth. Inhaled air passes through a filter in the canister that removes microscopic particles, poisonous or otherwise, and then through layers of activated charcoal which absorb remaining molecules of irritants.

Since adsorbent charcoal can soak up only a given quantity of poisonous molecules before becoming saturated, no military mask will afford indefinite protection in heavy concentrations. The standard canister will not protect against certain industrial gases such as carbon monoxide, ammonia, hydrocyanic acid and oil vapors, but will protect against all toxic gases likely to be used in war.

Protective covering is a cellophane cover designed to protect individual soldiers against blister gas sprayed from the air. It is an envelope large enough to cover a crouching man and his pack.

The top part is transparent. It is very light in weight, and occupies, when folded, very little space. In use the soldier punches a hole through its side through which he sticks his rifle. It is discarded after being used.

The protective ointment issued the soldiers is in a tiny kit and is spread on all exposed skin of the body. It prevents injury from a gas, and can also be used as first-aid treatment and for decontamination of personal equipment.

The special eye shields are stamped out of a clear, flexible plastic, and protect the eyes from blister gases and toxic agents. Four were issued with each gas mask. Held by an elastic band around the head, they can be worn in an alert position on the forehead like an eyeshade, or pulled down on the bridge of the nose in the ready position.

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## ELECTRONICS

## Electrical System Defects Shown in Flight

➤ A PROJECTED image on a screen showing defects in the electrical system of aircraft engines is one of the outstanding features of the new ignition analyzer developed by D. Napier and Son and the English Electric Company.

About the size of a portable typewriter, the analyzer, taking power from 220 volt A. C. mains or a 6, 12 or 24 volt accumulator, may be adapted as a permanent instrument on multi-motored planes. Peaked figures on the screen, one for each spark plug, arranged in the firing order of the engine, remain unchanged in shape and intensity when the ignition system is functioning properly, but flicker and alter shape in direct ratio to defects in corresponding spark plugs.

Easily diagnosed by visual characteristics of the fault, excessive spark gaps give a high figure, short-circuited gaps a correspondingly low figure, while an occasional miss shows instantly as a definite flicker. Defects in the magneto or distributor alter the entire row of figures as a unit.

By locating and diagnosing minor defects, dormant until the moment of breakdown, this tester can minimize loss of flying time and aid maximum engine efficiency. Operated in flight, potentially serious engine failure due to faulty ignition may be revealed, giving the pilot adequate time to find suitable terrain should a forced landing be necessary.

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Less sugar is required in a cake if dried fruits are used as filling.