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MILITARY SCIENCE

Defense Against Planes Shows Great Improvement

Defense from the ground against attack from the air, recognized ever since the world war as one of the most difficult of all military problems, has made great strides forward during recent months. New weapons and fire control instruments developed by the Ordnance Corps of the Army and now undergoing tests at the proving grounds at Aberdeen, Md., go far toward taking the soldier on foot out of the class of a mere helpless target for bombs and "strafing" machine gun fire from planes, to which he has been assigned by popular conceptions.

The most striking of the new means of defense is not in itself a new weapon, but a means of making more effective use of already existing weapons. This is the new electrical fire-control instrument for anti-aircraft guns, which enables the commander of a battery to sight all four of his guns simultaneously, and also to set the fuzes for all the shells. These important details have hitherto been attended to separately for each gun, with the result that errors both in direction of fire and in position of the shell at the moment of burst have crept in, seriously lowering the effectiveness of the fire. The new system makes it possible for a battery of four 3-inch guns to deliver a 15-pound shell every half-second, to a height of 10,000 yards, with a horizontal range of 15,000 yards. The same control system has been applied to the new 105-millimeter, or 4.1-inch guns, which fire only half as fast, but throw a shell more than twice as heavy to a height of 12,000 yards and an extreme horizontal range of 19,000 yards.

These two weapons commonly use shrapnel, which it timed to burst short of the target and throw toward it a shower of hardened lead alloy balls, shot-gun fashion. A smaller-caliber gun, however, is designed to attack planes with high-explosive shell that bursts on contact with even so slight an obstacle as the fabric of wing or fuselage. This is the 37-millimeter automatic, which throws a missile weighing about one pound. The piece is built like a machine-gun and barks once every second, so that a battery of four would send up a hail of 240 highly destructive shells in a minute. The new centralized fire control system can be applied to this gun as well, though this has not yet been done.

A third promising weapon is the new .50-caliber Browning machine gun, which throws a cigar-shaped bullet half an inch in diameter and weighing about two ounces. A newly developed mount permits four of these guns to be trained on a single pivot. Since each gun can deliver over 300 shots per minute, this arrangement places a stream of 20 missiles per second under the control of one gunner.

Ordnance officers do not expect to drive planes completely from the air, even with the further improvements still in prospect. Part of the anti-aircraft defense will still have to be undertaken by planes attached to the defense forces, just as the protection of our coasts is a joint task for the coast defense artillery and the fleet. But just as the coast defense artillery is usually able, by the mere threat of its presence, to keep an enemy fleet at a long distance, so the anti-aircraft weapons are expected to force enemy planes and dirigibles to fly at such heights that their bomb-dropping, observing, photographing and other activities will be relatively ineffective. Even the despised "archies" of war time, it is pointed out, forced German airmen to fly high, and there is simply no comparison between their range and accuracy and that of the anti-aircraft weapons of today.

(*Just turn the page*)

Anti-aircraft battery of 3-inch guns firing on target towed by airplane at the Aberdeen proving grounds. The new multiple fire control instrument is the center of an interested cluster of soldiers to the rear of the guns. Vertical range finder in the foreground.

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Defense Shows Improvement

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The soldier on foot is being given improved weapons against his entrenched enemies on the ground as well as against those that fly in the air. One of the most interesting of the smaller guns now undergoing tests at the proving ground is a three-inch mortar designed to be carried by the infantry as they go forward.

This piece throws the standard 12-pound artillery projectile to a range of 1740 yards. Though this is a short distance, as artillery ranges now go, it is quite adequate to be of great assistance in overcoming machine gun nests, breaking up "strong points," and resisting the advance of tanks. Since it is rifled, it is much more accurate than the loose-fitting smooth-bore Stokes mortar of wartime fame. Its speed of fire is not so great as that of the Stokes, but it has better hitting power, and its range is of course considerably greater.

An interesting use of this gun, as well as of the Stokes mortar, is the blinding of machine gun nests and other enemy positions by dropping smoke shells on them. If they can not see to fire the attacking infantry will be able to advance with fewer casualties.

The mortar is so designed as to be readily disassembled into loads which can be transported by hand.

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The dodo, a strange looking pigeon on the Island of Mauritius, became extinct in the seventeenth century.

Cod fishing and sheep raising are being developed in Greenland to help the 15,000 inhabitants to make a living.

A medical journal in 1869 said: "Out of every five children in the United States, three die before reaching the fifth year!"

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