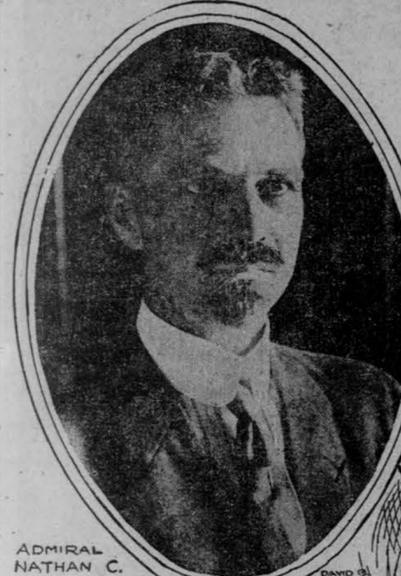


A GUN FOR POTTING SKY-SHIPS

Admiral Twining Invents an Upright Rifle That Experts Believe Will Make the Heavens Too Dangerous for Bomb-Dropping Aeroplanes



ADMIRAL NATHAN C. TWINING, U.S.N., INVENTOR OF THE AERO GUN

By William L. Aldorfer
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BEFORE long American warships will be equipped with another battery of guns to fight hostile invaders in the air. Uncle Sam, with the assistance of his ordnance experts at Washington, has invented a new gun that will shoot more than three miles straight up in the air. Any hostile airship coming within this distance of a battleship in future will be taking great chances, for the new gun will be able to bring it down, no matter how great the speed it may be traveling through the air.

After shooting a shell more than 18,000 feet into the air and closer to the skies than an aeroplane has ever flown, the experiments with the new naval gun destined to destroy the airships of an enemy, have proved successful even beyond the fondest hopes of its inventor, Admiral Nathan C. Twining.

The new gun is a great improvement over the aeroplane guns of other countries, as much of the intricate mechanism and gears has been eliminated. The perfection of this gun places the United States far in advance of her rivals in the matter of defence against aerial attack. Many guns for defence against aeroplanes have been built by European powers, but their success has been limited. Probably the best known aeroplane gun is manufactured in Germany. Recently this gun was mounted on an automobile truck, and is said to be efficient, but very clumsy. A crew of six men is needed to operate it.

All that is needed to put an aeroplane or balloon out of commission, and probably kill the occupants instantly, is to explode a small shell somewhere near it. The white hot steel from the bursting shell and the flame from the explosion are sufficient. This result can be obtained from the Twining gun, which is so small it can be operated by one man if necessary.

Admiral Twining's story of how he happened to design the gun is interesting and shows what can be done in a remarkably short time. "About a month ago I thought of the aeroplane guns invented by foreign countries and realized it was time the United States got in the procession. I started the plans and within a week they were finished.

"About three weeks from that time the gun was completed at the Washington naval yard and sent to the naval proving grounds at Indian head, where the experiments proved it a success.

"In an aerial gun the problem of the recoil and the sight is the hardest to overcome. The great difficulty in designing a mount to withstand the terrific recoil of a gun pointing directly up in the air was successfully met, and the only thing now necessary to make the gun accurate and almost sure to hit an airship is the matter of the sight. Our experiments at Indian head have given us sufficient data from which to design a sight, and it is now being done.

"Another great problem confronting us with an aeroplane gun is to figure out the trajectory or curve the shot describes while going through the air. When firing straight ahead or on a horizontal plane, this has been figured out to a certainty, but when we fire into the air—something entirely new—it is altogether different. However, it is certain this point will be determined in a very short while.

"In order to hit an aeroplane the man who sights the gun must be very skillful. It is something like wing shooting, and requires accurate judgment on the part of the man sighting the gun. The range finders we already have in the navy can be used to find the range of an airship just as well as finding the range of an object on a horizontal plane."

In speaking of the danger of bombs thrown from an airship striking the

deck of a battleship, Admiral Twining gives some interesting reasons why this would be next to impossible, unless the airship comes dangerously close to the battleship. He said: "A shot from a gun on a battleship can reach the aeroplane much quicker than a bomb can be dropped from the airship to the battleship. If a gun could be placed on an airship and fired downward, the airship would then be in nearly as good a position as the battleship, but there has been no such gun yet invented. The question of weight comes in here. A gun to be of any value at all should weigh about 100 pounds, and when this weight is added to that of the operator it would be too heavy for the aeroplane to carry."

"A striking and simple illustration of the difficulty an airman would experience in dropping a bomb on the deck of a battleship is that of a person going over a trestle in a railroad train traveling at the rate, say, of 30 miles an hour, trying to drop an orange between two ties of the trestle. In order to accomplish this feat it would be necessary to drop the orange several seconds before reaching the particular ties because the velocity of the train would throw the orange ahead just so many feet. This is the problem the airship is up against when it attacks a battleship, only on a much greater scale.

"Again, the weight an aeroplane can carry is limited and very few bombs could be carried by the airman; but, on the contrary, a battleship carries almost any amount of ammunition, and it can therefore afford to take more chances than an airship. This same reasoning applies if a fleet of airships should attempt to destroy a city.

"We hope ultimately to have such a sight that will enable us to fire at and reach an aero at any point in the sky within a vertical distance of at least 15,000 feet, or within a horizontal radius of a mile. And we believe that such a sight will be designed shortly. When this is done there will be practically no danger to be apprehended from an airship."

While the new gun can be fired from any angle in a half circle, it is the general belief that it will never be aimed at 90 degrees or in a perpendicular position, for the reason that the shell might return to the deck of the battle-

ship, probably unexploded, and there would be the destruction intended for the enemy. The angles of firing probably will range from 50 to 75 degrees.

When the gun was submitted to its first test at Indian Head, Md., 15 shots were fired in the air at various angles, then the gun was lowered to 70 degrees, but the firing crew lost sight of the place where the shell fell because of the haze. Unloaded shells were used in the experiments. The fuse of a loaded shell is so sensitive, ordnance

experts say, that explosion would result immediately upon contact with an airship even though it grazed only a wing and would disable or demolish the aeroplane and probably kill the aviator.

The second day's tests were even more favorable than the first day. A preliminary examination of the new gun showed it stood the first test without injury. The first shot was fired at an angle of about 70 degrees and a long line of smoke, curving slightly as

it reached the heavens, furnished the commanding officer with his only clue as to the course of the shot. Observers placed along the river bank to ascertain the spot where the shot struck said it had become lost in the haze.

A few seconds afterward another shot was fired at a lower angle. This test continued, the gun being altered with every shot, until 10 rounds had been fired. The gun was swung on its turret so as to cover a quarter of the horizon and discharged at angles ranging from 60 to 85 degrees.

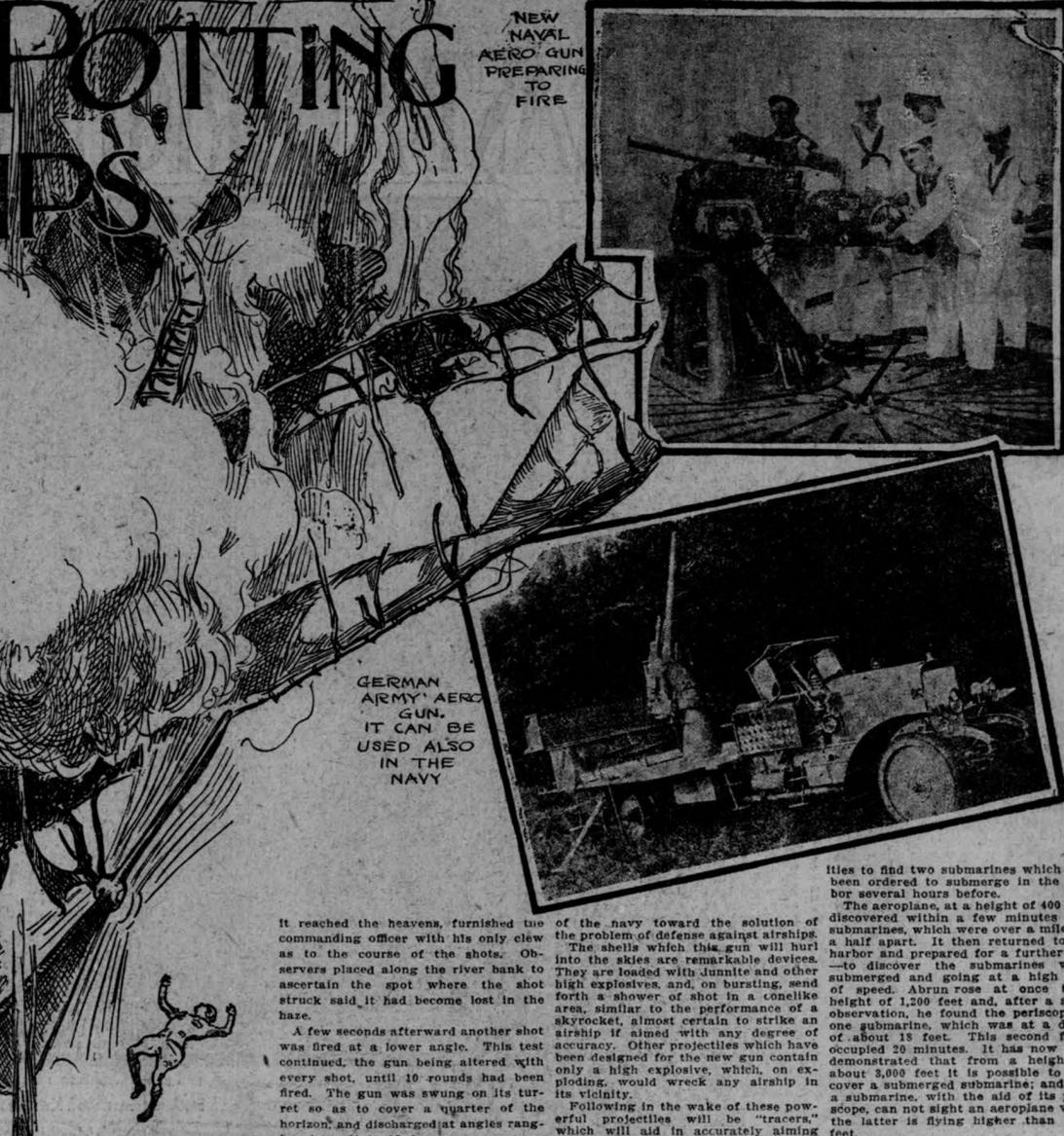
It was then arranged to point at an angle of 75 degrees, when the final volley of the day—five shots fired in rapid succession at an imaginary aeroplane—was discharged. From these tests it was shown that the new aero gun could, in warfare, keep up continuous firing at the rate of 12 shots a minute.

The government expects to build at least 25 of the new aerial guns and, after being tested at the Indian head proving grounds, they will be sent immediately to the battleship fleet for mounting in a new deck battery. Because of the low caliber it will be possible to have them made at the Washington navy yard. This foundry has for years been too small to meet the exacting casting requirements for modern big guns, and all big gun castings have been made by private concerns.

The idea of the new one pounder gun is expected to be developed later into a three inch gun. Naval experts say the three inch gun will shoot seven miles straight up into the air, and with this great range they claim no airship will be able to live long enough to come within striking distance of any battleship. And even should it manage to live through the hail of shot and shell which would greet it, the chances are a thousand to one it would fall in strik-

ing the battleship with a bomb. The army has progressed even farther than the navy in perfecting an aeroplane gun. The new army gun is a six pounder, equipped with specially adapted high explosive projectiles and shrapnel shells, to demolish aeroplanes and balloons in battle. It can be elevated at any angle and throws a shell seven miles.

The construction of the new army rifle has just been completed at the Rock Island, Ill., arsenal. Experiments with it are expected to begin at the Sandy Hook proving grounds within a fortnight. The army thus is in advance



GERMAN ARMY AERO GUN. IT CAN BE USED ALSO IN THE NAVY

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