Lassoing Aeroplanes with Bomb and Flame

By H. GERNSBACK

STOPPING an aerial raid by means of anti-aircraft guns is a notoriously impossible undertaking. While the aeroplane itself is now, and probably will always be the most trustworthy means of combating enemy bombing planes, there has been felt for some time the want of other means to bring down the raider.

We must not lose sight of the fact that a large city like Paris or London requires hundreds of the very best fliers as well as machines to safeguard these cities. These fliers could be used to a tremendously better purpose at the front hunting down Hun planes, while the former are kept locked up indefinitely to ward off enemy bombing squadrons.

Anti-aircraft guns firing shrapnel do not bother an intrepid flier in the least nowadays. It frequently happens that a pilot must fly as low as 2,000 feet in order to successfully set into flames a boche "Drachen," as the German observation balloons are called "Over There." These aerial sausages are fired upon at close range by the Allied pilots, who use incendiary "phosphoric" bullets to accomplish the purpose. To do so they must fly low which immediately draws the fire of the boche protecting anti-aircraft guns below.

Nevertheless our pilots brave his barrage and fly right thru it. They "slip," nose-spin, loop-the-loop or "pancake," making it almost impossible for the gunners to get the range. If the pilot knows his business he returns invariably to his airdrome, barring a few holes in his wings or in the fuselage of his machine. For be it known, there is no greater disgrace for a flier than to be shot down by land guns.

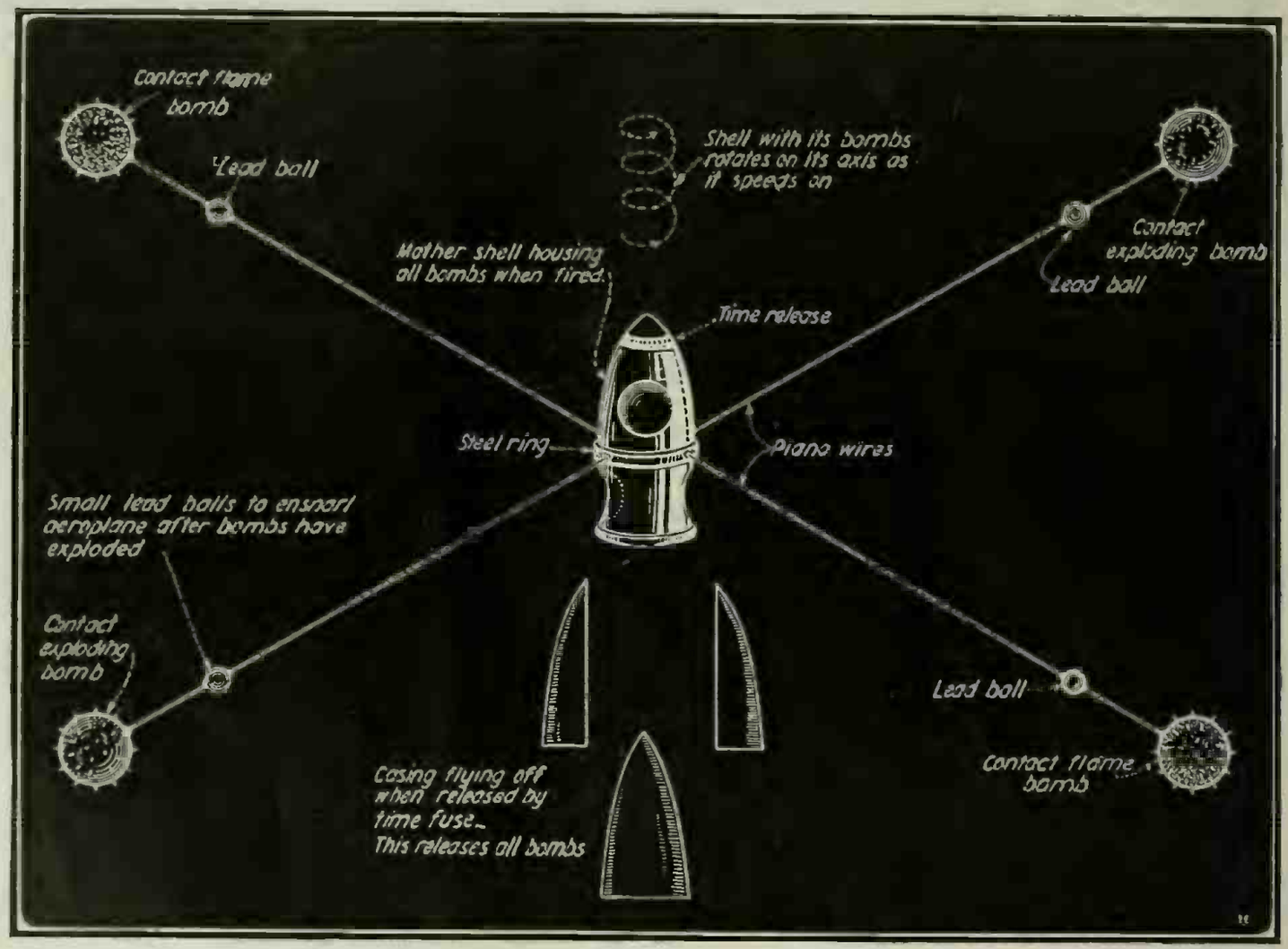
If we had a positive means to bring down a raiding flying machine without utilizing our own or our Allies' aeroplanes, we would, of course, have the enemy at a great disadvantage.

Bearing these things in mind, the writer advances a plan which to a certain degree accomplishes such a result. The principle itself is very old and well known, the application and the various refinements only being new.

In short the idea centers itself upon the time-worn "chain-shot," which was nothing else but chaining several cannon balls together and shooting them at the enemy with devastating results. As the erratic flight of such a device made it extremely inefficient, it was soon given up and came into disuse.

In the present device the writer proposes the use of a "mother-shell" containing two explosive bombs, as well as two "liquid-fire" bombs. Each one of these bombs has a smaller companion—a heavy lead ball, the purpose of which is explained later.

All of the bombs and balls are normally housed in the metal mother-shell which need not be very heavy, as it does not contain any explosive charge itself. All the bombs are kept in their respective places by means of a casing composed of eight pieces of reasonably thin steel. These pieces are released from the mother-shell, and fly off as soon as the time mechanism located at the apex of the mother-shell permits this. This time mechanism works on the principle of the one used on shrapnel, the purpose of the present device being to keep the mother-shell intact till it comes within a few hundred feet of the aeroplane under attack. This, of course, makes for great accuracy, as the mother-shell can be accurately timed, and being a self-contained shell like any other, its flight will naturally be true.



A new "Lasso Shell" which can be shot from a cannon and used to combat enemy aeroplane attacks. It is fitted with a time fuse so as to "explode" at a certain height, liberating the explosive and flame bombs, attached by piano wires as illustrated. If these do not finish the enemy 'plane there are still the flying lead balls to be conjured with.

The mother-shell in addition is "rifled," exactly like other big shells. A rifled shell while still in the cannon is made to turn on its axis by following a corkscrew path cut into the inner walls of the cannon. This imparts a spinning action to the shell which it maintains during its entire flight. So while the shell flies over its course with its nose pointed at its target, *it also spins like a top*. This spinning action, it has been found, keeps the shell better on its course than if it did not spin.

In the case of the rifled mother-shell, another distinct advantage is had. Aside from keeping the shell on a true course as soon as the time mechanism acts, the pieces of the casing are thrown violently outward by centrifugal action. The same is the case of the four bombs which are hurled outwardly as shown in our cover illustration. Each set of bombs and balls are attached to a central steel ring by means of a thin, but tremendously strong steel piano wire. Each wire may be from two hundred to three hundred feet long as desired. But as the mother-shell and the various bombs still have their rotary (spinning) motion, it follows that the entire device will continue to revolve not unlike a miniature planetary system. The four piano wires will be straight and taut, and as they cut the air at a great rate of speed, they will probably "sing" with a weird as well as a shrill note. If you ever swung a stone attached to a string over your head, you will know what we mean.

We now have an aerial lasso *par excellence*, covering a circular space of from four hundred to six hundred feet, all depending upon the length of the piano wires.

Woe to the enemy aeroplane flying into it, or which is overtaken by it! There can be no escape. If either of the two contact-exploding bombs touch the aeroplane, it will be wrecked by the terrific ensuing explosion. If either of the contact-flame bombs touch, liquid fire will be sprayed over wings or fuselage, setting the plane on fire.

But let us suppose that neither type of bomb were effective, or touched only non-vital parts of the enemy plane. Here it is where the lead balls take up their deadly work. Suppose all the four bombs had been exploded. If it were not for the four lead balls, the four piano wires would simply go limp and the fight would be over. But having these lead balls spaced about ten feet from the explosive bombs, they will not be affected at all after the former have been set of. The planetary system broadly speaking, still remains intact, altho now we have only four "moons" left. But suppose only one of them manages to get entangled in the trusswork of the enemy plane. Immediately the flight of the entire system is stopt abruptly and the three other balls come whizzing around, snarling up the entire plane and breaking the wings, fuselage or tail as they come crashing down at a terrific speed. You have read of the terrible Mexican lasso, the *Bolas*, which is a lasso with lead balls. It works on the same principle as our aerial lasso, only the latter having lead balls weighing several pounds apiece, will cause correspondingly greater havoc, especially on a comparatively fragile aeroplane.

Perhaps you have read accounts of aerial fliers and their dread to intercept the course of even the smallest bird. It is a well known fact that an aeroplane propeller revolving at its great speed, will be instantly shattered if a bird as small as a sparrow flies into it. Therefore it may be imagined what a large lead ball, or a powerful piano wire will do to a propeller, should either come in contact with it.

To prevent the aerial lasso from causing widespread damage thru fire or explosion, should it miss an aeroplane, the four bombs can be equipt with time fuses, exploding them before they reach the earth. Of course, the four lead balls might cause damage, but certainly not more than the myriad of shrapnel balls and shell fragments, crashing to the ground during an aerial barrage.

The aerial lasso built on a smaller scale could, of course, be used between combating aeroplanes. If our planes were equipt with them, as well as the necessary guns to fire them, the Boche planes certainly would be at a terrible disadvantage.

WHAT IS HIGH SPEED?

One of the first questions the layman asks the aviator is, "How does it feel to fly?" by which is generally meant, what is the sensation of speeding thru the air at the rate made possible by the aeroplane. The following abstract from an article appearing in *Flight* should be enlightening:

An analysis of sensation is always interesting and might be expected to be exceptionally so in the case of speed, yet paradoxically enough there is no such thing as a sensation of speed. There are many proofs of this, but I will adduce for one, that the early centuries of human existence man, tho he has since been proved to be moving thru space at the prodigious speed of some thousands of miles per hour, thought himself to be living on the immobile hub of a rotating dome of the moving planets and stars.

What then is it that we feel when we are moved rapidly by an aeroplane? The answer is the illusion of speed, inspired by a summation of sensations which we have the habit of associating with rapid motion. This illusion can easily be induced without moving the man, and it has often been done, for example, at one of the Earl's Court exhibitions a passenger trolley on a few feet of rails was arranged at the centre of a large room of which the walls and ceilings were mounted so as to be bodily rotated round the trolley. The trolley was given a little jerk to convey the impression of a starting acceleration, and then as the trolley became *stationary* the room was made to turn at an increasing speed round the experimenters, who suffered from the conviction that they were traveling on smooth rails at a high speed.

Our impression of speed is derived largely from the optical effect, due to adjacent objects flitting by, and is increased by a surface or skin effect due to the wind which brushes past us and cools and presses on to our persons. These two effects are sufficient, but the impression is heightened by going a little further. Our past experience of most mechanical and animal means by which we have borrowed speed has shown us that they are rarely if ever perfectly smooth in their action. After the change of speed due to the starting operation there are slight irregular changes of speed and changes in the direction of the movement. These are always associated with rapid traveling; we call them jolts and jars if they are severe, and we wrongly regard them as part of the sensation of speed, tho they are pure accidentals. They ought properly to be called accelerations, and the act of starting is the only acceleration which is in fact necessary to obtain speed. Yet a fourth factor can be detected in many of our impressions of speed. I allude to noise, whether of whistling wind or of beating hoofs or of moving machinery. These things no more constitute a sensation of speed than the bristles constitute a hedgehog. They are merely excrescences and causes of independent sensation. At one time or another an aeroplane flight gives rise to all these sensations to an acute degree, and super-adds one novelty, that of the point of view.

The following comparative table of speed is of interest:

1. Light and the electric telegraph, 186,000 m.p.s.
2. Shell near the muzzle of 6-in. gun, 2,500 feet per second.
3. Shell from 75 mm. gun, 1,600 f.p.s.
4. Sound, 1,100 f.p.s.
5. Revolver bullet near the muzzle, 500-800 f.p.s.
6. Tip of the blade of an airscrew, 600 f.p.s., or 400 m.p.h.
7. A fast aeroplane through the air, 150 m.p.h.
8. A fast aeroplane with a high wind, 200 m.p.h.
9. A fast car, 120 m.p.h.
10. An express train, 80 m.p.h.
11. A fast steamship, 40 m.p.h.
12. A bicycle (pedaled), 32 m.p.h.
13. A race horse, 30 m.p.h.
14. A man skating (for a mile), 24 m.p.h.
15. A man running (100 yards), 20 m.p.h.
16. A man running a mile, 13 m.p.h.
17. A man walking, 4 m.p.h.

French electrical works have arranged to employ men who have been blinded in the war to wind armatures after the system of Dr. Schuyler Wheeler of New York. It is also understood the system will be introduced in England.