L. L. DRIGGS, JR.

FIXED AMMUNITION.

APPLICATION FILED SEPT. 8, 1920.

1,417,460. Patented May 23, 1922.

3 SHEETS—SHEET 1.

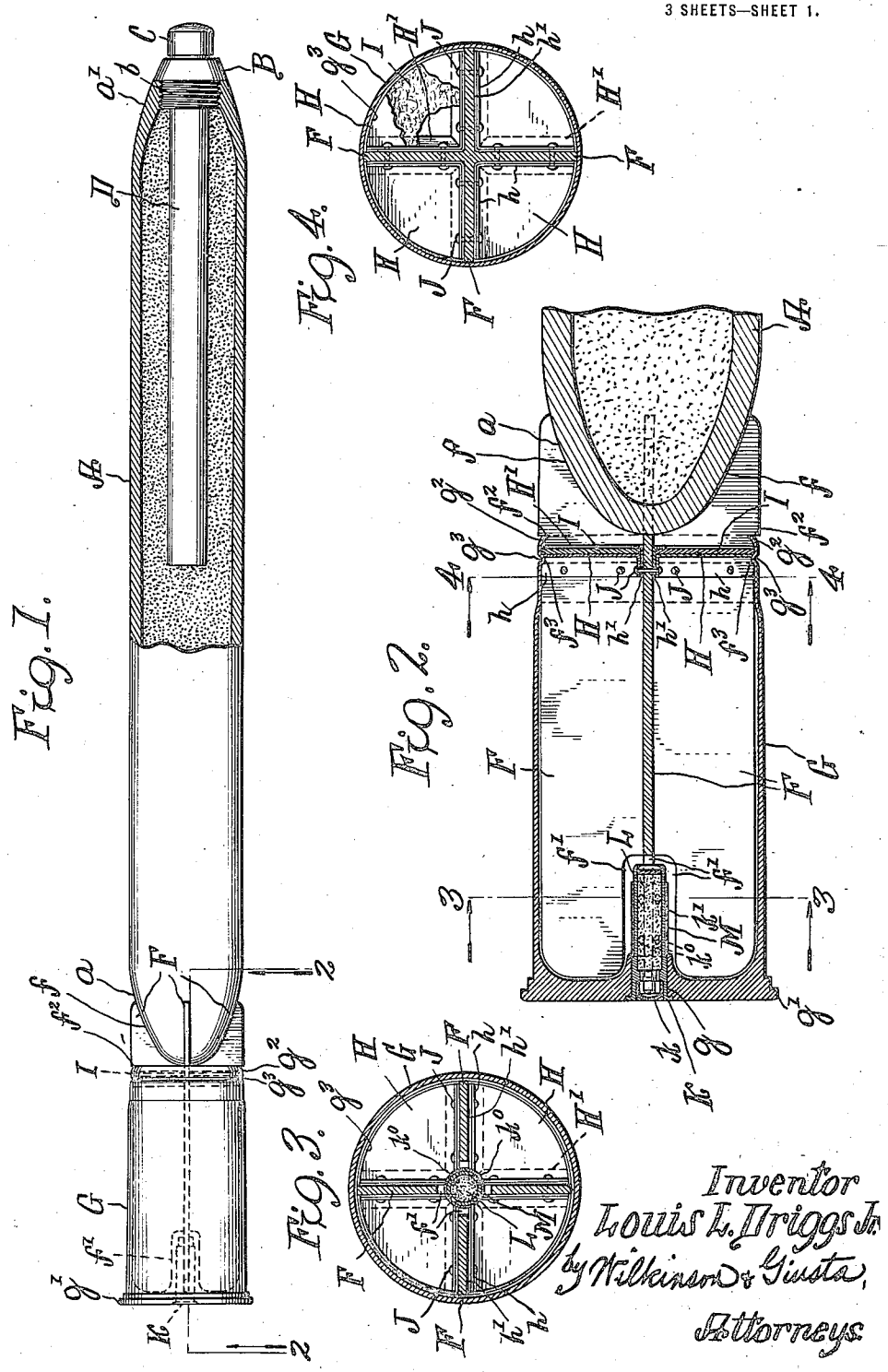


Fig. 1.

Fig. 4.

Fig. 2.

Fig. 3.

Inventor
Louis L. Driggs Jr.
by Wilkinson & Giusta,
Attorneys

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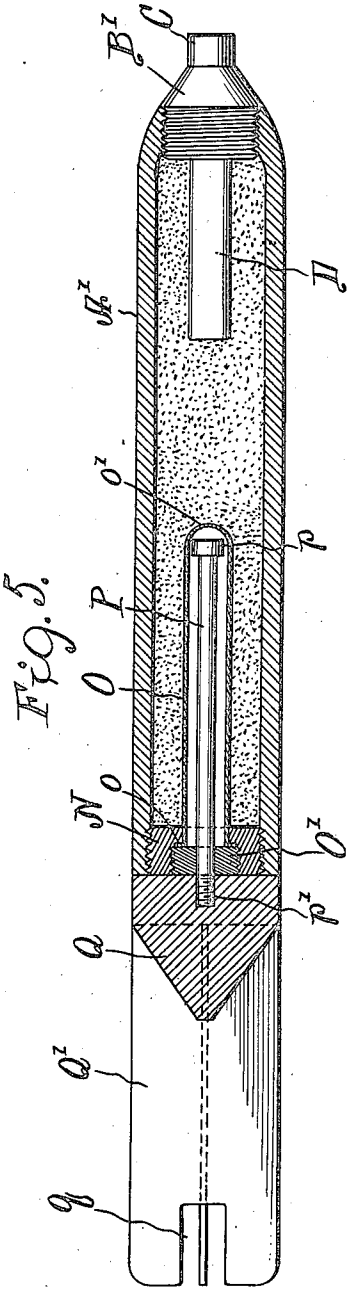


Fig. 5.

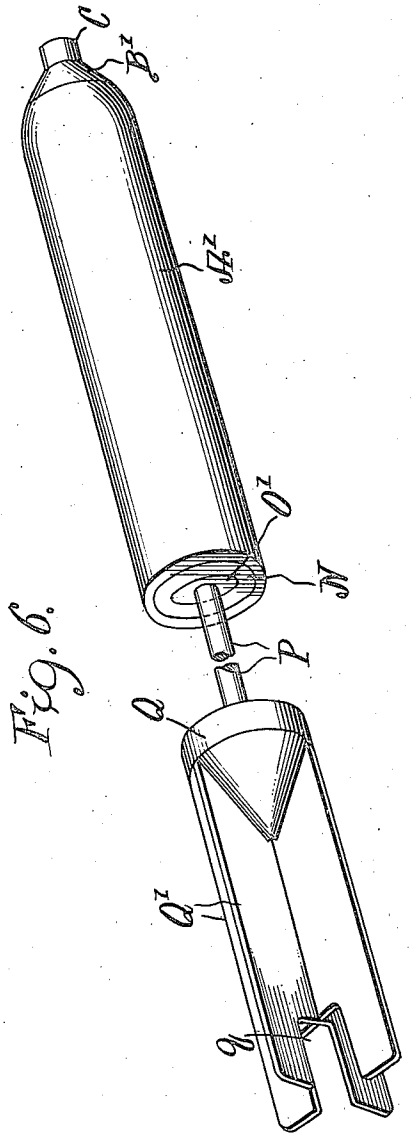


Fig. 6.

Inventor
Louis L. Driggs Jr.
by Wilkinson & Giusta,
Attorneys.

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3 SHEETS—SHEET 3.

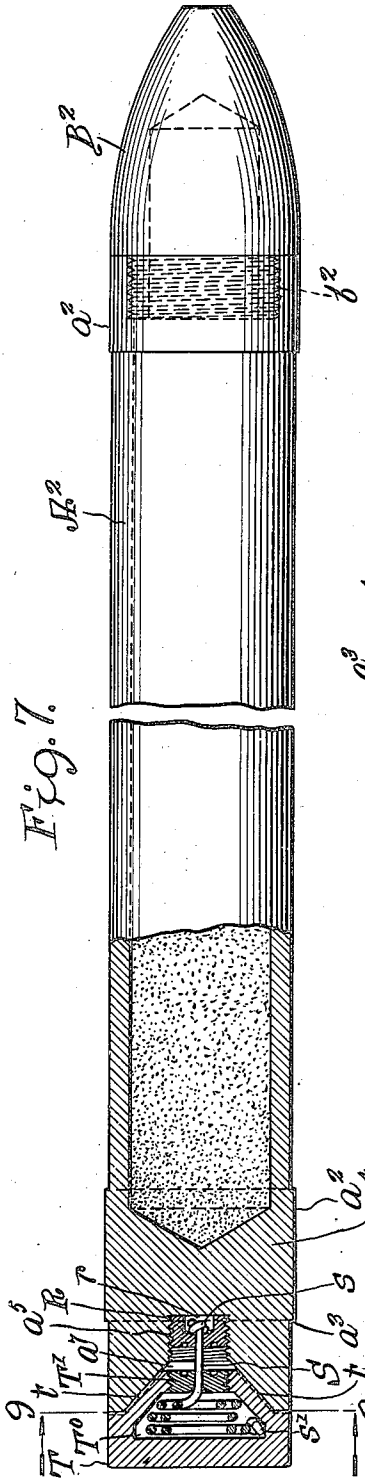


Fig. 7.

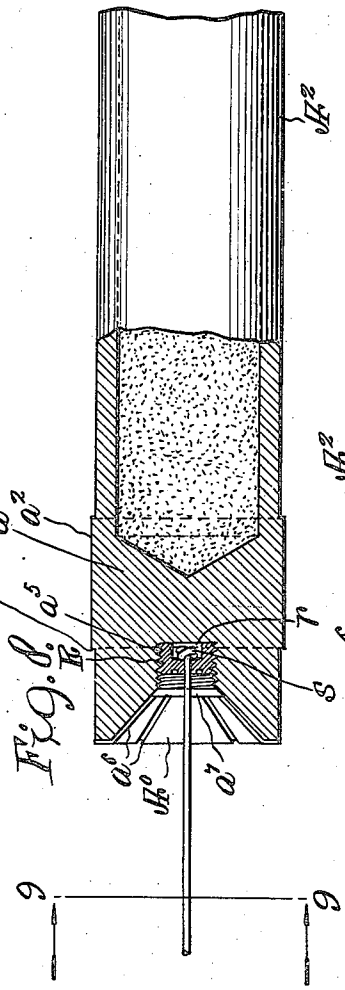


Fig. 8.

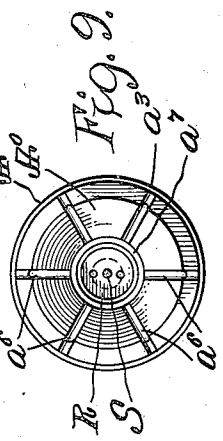


Fig. 9.

Inventor
Louis L. Driggs Jr.
by Wilkinson & Giusta
Attorneys

UNITED STATES PATENT OFFICE.

LOUIS L. DRIGGS, JR., OF NEW YORK, N. Y.

FIXED AMMUNITION.

1,417,460. Specification of Letters Patent. Patented May 23, 1922.

Application filed September 8, 1920. Serial No. 408,825.

To all whom it may concern:

Be it known that I, LOUIS L. BRIGGS, Jr., a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Fixed Ammunition; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements in fixed ammunition for use in connection with shells containing high explosive, gas, illuminating composition, or the like, or for use as shrapnel, and it is intended primarily to provide an arrangement in which a long, thin walled shell containing a comparatively large bursting charge may be safely fired from a gun either of standard type, or of special make, or from a mortar.

The shell of this projectile is more or less of streamline form, and the projectile, instead of being directed in its flight by a rifling band, carries a stabilizing tail which is secured thereto and keeps the projectile head on in its flight, while this tail projects into a cartridge case carrying a propelling charge.

My invention will be more fully understood after reference to the accompanying drawings, in which like parts are indicated by similar reference symbols throughout the several views, and in which:—

Figure 1 shows a side elevation of the fixed ammunition, part of the shell being broken away.

Figure 2 shows an axial section through the rear end of the shell and the cartridge case, parts being shown in elevation, the section being taken along the lines 2—2 of Figure 1, and the parts being shown on a larger scale than in Figure 1.

Figure 3 shows a section along the line 3—3 of Figure 2, and looking in the direction of the arrows.

Figure 4 shows a section along the line 4—4 of Figure 2, and looking in the direction of the arrows, parts being shown as broken away.

Figure 5 shows a central section, partly in elevation, of a modified form of projectile in which the tail is slidably connected to the main body of the projectile, the parts being shown in the firing position.

Figure 6 is a perspective view of the device shown in Figure 5, parts being broken away, and the tail being shown drawn to the rearward.

Figure 7 is a side elevation, partly in section, of a modification in which the stabilizing tail is connected by a flexible connector to the main body of the projectile, parts being shown in the normal firing position with the cartridge case omitted.

Figure 8 is a similar view of the rear end of the projectile shown in Figure 7, with the stabilizing tail in the extended position; and

Figure 9 shows a section along the line 9—9 of Figure 8, and looking in the direction of the arrows.

Referring first to the form of device shown in Figs. 1 to 4, A represents a shell which is preferably tapered at the rear, as shown at *a*, the said taper being preferably in the form of an ellipse so as to get great strength to resist the effect of the propelling charge, and also to decrease resistance as the projectile flies through the air. The nose of the projectile is also tapered, as at *a'*, in the usual way to receive the screw threads *b* of the cap B which carries a suitable fuse C, and also the container D for the booster charge for exploding the charge contained in the shell. It will thus be seen that the shell body proper is of substantially streamline form and will encounter a comparatively slight resistance as it passes through the air.

To the rear end of the projectile a cruciform tail is attached, consisting of the fin plates F which may be made as a single piece, or may be secured or welded together in any convenient way. Each of these fin plates F is cut away, as at *f*, to fit snugly against the tapered portion *a* of the projectile, and the tail piece may be welded to the projectile or secured thereto in any convenient way.

Each of these fin plates is cut away at the rear, as at *f'*, to permit the insertion of the primer and the parts connected therewith, and each fin plate is also indentated, as at f^2 and f^3, to permit the compression thereinto of the finished end of the cartridge case G, which passes freely over the tail of the projectile, as shown most clearly in Figure 2, and is clamped thereto by pressing the parts g^2 and g^3 of the cartridge case into the notches f^2 and f^3 of the fin plates F.

The cartridge case G provides a large

chamber for the propelling charge, not shown, which is divided by the fin plates F into a series of segmental chambers which open to the rear into the space surrounding the fuse, as shown in Figure 2. The forward end of each of these segmental chambers is closed by the angular plates H, flanged as at h, and secured to the fin plates as will be hereinafter described.

The segmental wads I made of fibre, cardboard or the like, and preferably placed in front of the plates H, may be held against accidental removal by the angle irons H′ flanged as at h'. The plates H and angle irons H′ are secured to the corresponding fin plates by means of the rivets J.

The rear end of the cartridge case may be provided with the usual rim g', and is perforated, as at g, to permit the insertion of the fuse, and also to permit the filling of the propelling charge into the cartridge case. This propelling charge is not shown for the sake of clearness in the drawings, and the range may be varied by determining the amount of the propelling charge used.

Any suitable primer may be used, such as the primer K, having the cap k, and the stock k' containing the ignition charge L. This stock may be perforated, as at k', to permit the escape of the flame, and these perforations may be closed by a suitable tubular sheath M of tin or lead foil, paraffin paper, or the like.

The cartridge case should be shaped to engage in the powder chamber of the gun, not shown, and the maximum diameter of the shell should be less that the diameter of the bore between the lands of a rifled gun, or should pass freely through the bore of a smooth bore gun or mortar.

In the modification shown in Figures 5 and 6, instead of being rigidly attached to the projectile, the stabilizing tail is slidably connected thereto by means of a sliding rod which permits the tail to be dragged to the rear through a limited distance relative to the projectile after the projectile has been fired from the gun, and while it is flying through the air, and thus a drag is applied to the tail of the projectile tending to keep the nose in the line of the trajectory.

In these two figures, A′ represents the body of the projectile, whose forward end is closed with a cap B′ provided with the fuse C, preferably having the container D containing the booster charge.

N represents the plug closing the rear end of the projectile which is chambered to receive the screw block O′, which holds the flange o of the tube O in place and also serves as a guide for the rod P. This tube O is closed at its forward end, as at o', and permits the free travel of the head p of the plunger rod P, whose rear end p' is screwed fast to the block Q of the stabilizing tail, which is provided with fines Q′ which may be slotted at the rear, as at q, to clear the primer, as is shown in detail in Figure 2.

The cartridge case, not shown, is slipped over the tail and is secured either to the tail or to the projectile as may be preferred.

In the form of device shown in Figures 7 to 9, A^2 represents the body of the projectile whose forward end is closed by any suitable cap B^2, which may be screwed into the forward end of the projectile, as at b^2, and may be provided with any suitable fuse, not shown. The body of the projectile is preferably provided with enlarged portions a^2, the forward one of which serves to center the projectile in the bore of the gun without causing it to bind throughout its length, and the rear end serves not only for this purpose, but also the shoulder a^3 provides a suitable abutment for the cartridge case, not shown.

The rear end of the main body of the projectile is in the form of a solid mass, as at a^4, which is chambered as at a^5 to receive the screw-threaded plug R whose forward end is chambered, as at r, to receive the stop s at the forward end of the connector S which connects the main body of the projectile with the tail T. This flexible connector is rove through the screw block T′ and is normally coiled up in the chamber T^0 provided in the tail T. The forward end of this tail is tapered as at t to engage in the tapered chamber A^0 in the base of the projectile, and the said tail is normally held in the position shown in Figure 7 until after the projectile is fired from the gun, in which case the tail assumes the position shown in Figure 8 and tends to serve as a drag at the rear of the projectile, causing its point to follow substantially a tangent to the trajectory.

In order to prevent the tail from sticking in the chamber A^0 in the base of the projectile, I provide a series of gas passages a^6 in the interior of the chamber A^0 which communicate with the annular passage a^7 so that as the projectile is fired from the gun the powder gases of the propelling charge will flow into these passages and will tend to force the tail backwards as soon as the pressure on the outside of the tail falls, as will happen when the projectile leaves the gun, at which time the imprisoned gas in these passages a^6 and a^7 will tend to blow the tail piece backwards, and the resistance of the air will cause it to quickly assume the position shown in Figure 8.

In all forms of the device it will be seen that the tail tends to stabilize the projectile in its flight, causing it to fly forwards without tumbling, and thus rendering it possible to successfully use percussion fuses. This dragging effect on the tail of the projectile is especially desirable where the low initial velocities are imparted to the projectile, and where it is desired to fire the projectile at

high angle fire, as in attacking nearby trenches, or the like.

It will be obvious that various modifications might be made in the herein described construction, and in the combination and arrangement of parts which could be used without departing from the spirit of my invention; and I do not mean to limit the invention to such details except as particularly pointed out in the claims.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is:—

1. Fixed ammunition of the character described, comprising an elongated projectile, a stabilizing tail comprising a plurality of fin plates joined together axially and secured to said projectile, the said fin plates being provided with engaging notches on their exterior near their forward ends, and a cartridge case mounted over said tail and having portions of its forward portion pressed into said notches.

2. Fixed ammunition of the character described, comprising an elongated projectile, a tail comprising a plurality of fin plates joined together and secured to said projectile, a cartridge case mounted over said tail and secured to said fin plates, the said fin plates dividing the interior of the cartridge case into a series of angular compartments, and a wad formed in segments normally closing the forward ends of said compartments.

3. Fixed ammunition of the character described, comprising an elongated projectile, a tail comprising a plurality of fin plates joined together and secured to said projectile, and a cartridge case mounted over said tail and secured to said fin plates, the said fin plates dividing the interior of the cartridge case into a series of angular compartments, a wad formed in segments normally closing the forward ends of said compartments, and angle irons secured to said fin plates and holding said wad segments in place.

LOUIS L. DRIGGS, JR.