O. I. STRAUB.

ANTI-AIRCRAFT PROJECTILE.

APPLICATION FILED OCT. 5, 1917.

1,312,764.

Patented Aug. 12, 1919.

2 SHEETS—SHEET 1.

Fig. 3.

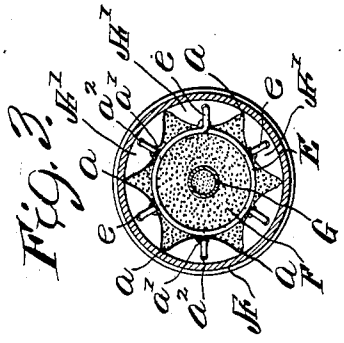


Fig. 4.

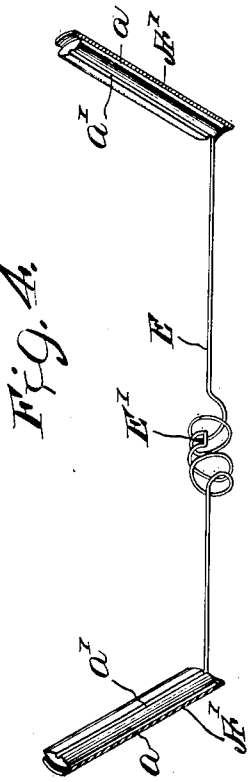


Fig. 5.

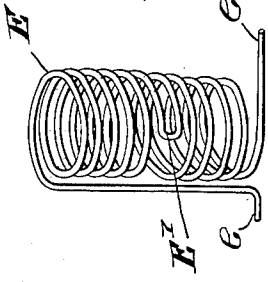


Fig. 2.

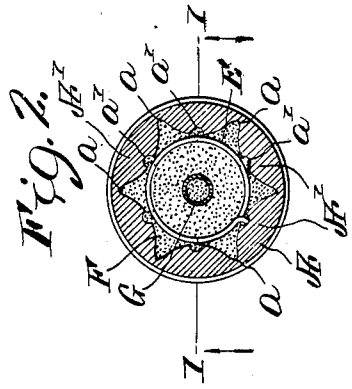
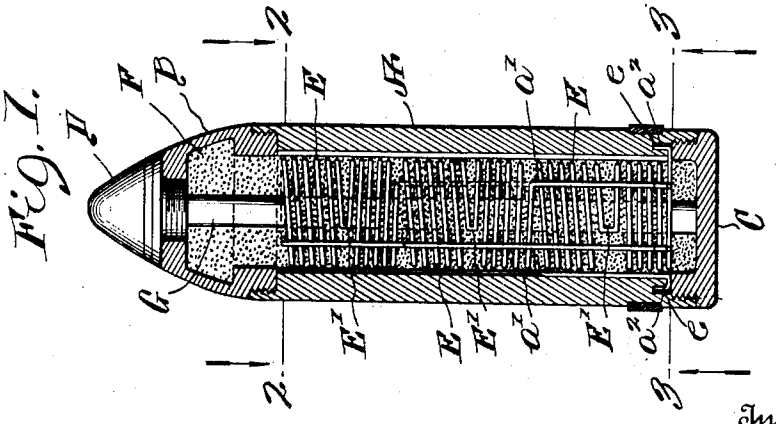


Fig. 1.



Witness

Edwin J. Beller.

Inventor

Oscar I. Straub.

by Wilkinson & Ginsta

Attorneys

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2 SHEETS—SHEET 2.

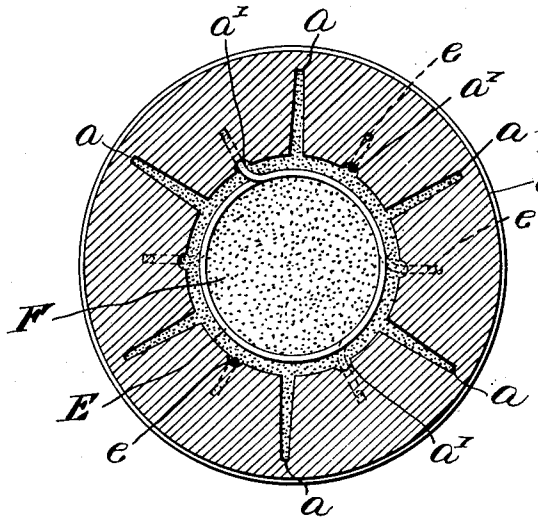


Fig. 6.

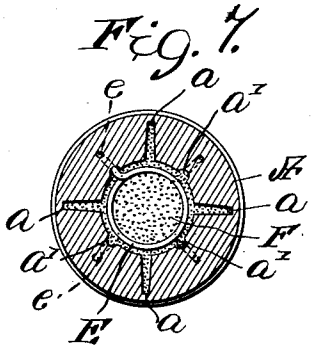


Fig. 7.

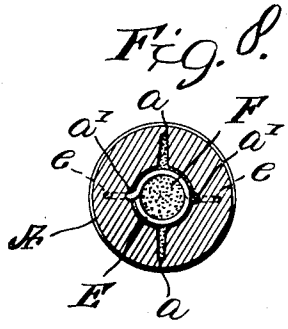


Fig. 8.

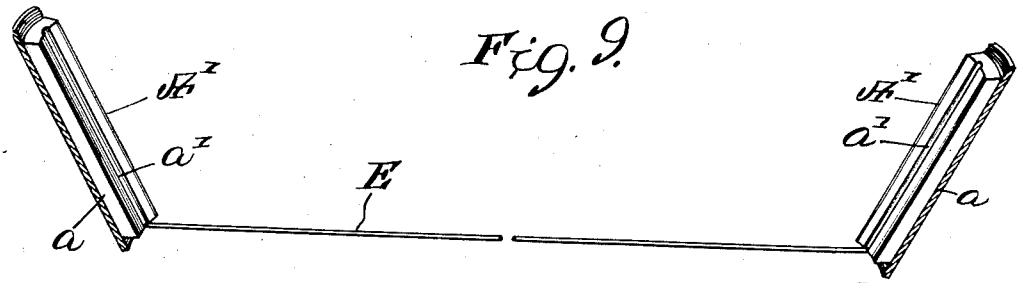


Fig. 9.

Witness

Edwin J. Beller.

Inventor

Oscar I. Straub.

by Williamson & Gieseler,

Attorneys.

UNITED STATES PATENT OFFICE.

OSCAR I. STRAUB, OF THE UNITED STATES ARMY.

ANTI-AIRCRAFT PROJECTILE.

1,312,764. Specification of Letters Patent. Patented Aug. 12, 1919.

Application filed October 5, 1917. Serial No. 194,952.

To all whom it may concern:

Be it known that I, OSCAR I. STRAUB, colonel C. A. C., U. S. A., a citizen of the United States, stationed at Fort Adams, Newport, in the county of Newport and State of Rhode Island, have invented certain new and useful Improvements in Anti-Aircraft Projectiles; 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 projectiles intended to be especially used against air craft, but which also may be used against troops in the field, or barbed wire entanglements, and other obstacles.

My invention relates to that type of projectile which is composed of a number of oppositely disposed parts connected together by a wire or chain, which parts separate when the projectile bursts under the action of the explosive charge, stretching the wire and causing the pairs of parts, with the wire connecting the same, to fly forward, thus enabling each pair of parts with the connected wire to cover a wide distance.

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

Figure 1 shows a projectile somewhat similar to the common shrapnel, but with the wires substituted for balls, the projectile being shown in axial section, and parts being shown in elevation, the section being taken along the line 1—1 of Fig. 2;

Fig. 2 shows a section along the line 2—2 of Fig. 1, and looking in the direction of the arrows;

Fig. 3 shows a section along the line 3—3 of Fig. 1, and looking in the direction of the arrows;

Fig. 4 shows two of the fragments of the shell of the projectile with the wire joining the two, but before the parts have uncoiled the wire to its full length, that is before the fragments have completed their outward travel, relative to each other, the parts in this view being shown on a smaller scale than in the preceding figures;

Fig. 5 is a detail showing the reverse winding of each coil of the wire;

Fig. 6 is a similar view to Fig. 2, but shows different forms of grooves in the shell of the projectile, and omits the central tube of Fig. 2;

Fig. 7 is a similar view to Fig. 6, but shows the shell of a projectile which is adapted to be broken into four parts;

Fig. 8 is a similar view to Fig. 7, but shows the shell of a projectile adapted to be broken into two fragments only; while

Fig. 9 shows on a smaller scale two of the fragments of Fig. 6 after they have been thrown outward by the explosive charge, tautening the wire.

Referring first to Figs. 1, 2 and 3 A represents the cylindrical shell of a projectile, having the nose cap B screwed into the forward end thereof, and the base cap C screwed into the rear end thereof. This projectile is provided with a series of deep grooves *a* which afford lines of cleavage when the projectile bursts. These grooves are symmetrically disposed, and are so arranged that when the projectile bursts there will be a number of opposite pairs of fragments thrown outward, each pair of fragments being connected by a wire E. Chains may be used instead of wires.

Before the cap C is put in place the wire coils E are inserted. These coils are preferably wound from the middle E′ in reverse directions, as shown in Figs. 1, 4 and 5, so that the wire may be tautened without kinking. The free ends *e* of the wire are led in the groove *a′* provided in the inner wall of the shell A, and are secured in sockets a^2 in the base of the shell A, where they may be held by electric welding, soldering, or in any other convenient way. It is evident that the sets of wire may be inserted in a bundle form as well as in coils.

As the shell A shown in Figs. 1, 2 and 3 is intended to be broken up into six parts A′, there are three of these coils of wire

shown superposed in Fig. 1 and embedded in the bursting charge F. This bursting charge may be provided in any convenient way, as by means of the fuse D and the ignition charge contained in the paper tube G. This tube G may be omitted as shown in Figs. 6, 7 and 8, and the bursting charge F may be ignited directly by the fuse.

In Fig. 6 I have shown a cross section of a heavy projectile adapted to be broken up into six parts A', the grooves *a* providing lines of cleavage for the fragments, and the grooves *a'* being provided for convenience in mounting the coils of wire inside the projectile.

In Fig. 7 I have shown a projectile body which is adapted to be broken up into four parts only, in which case two coils of wire only would be needed; while in Fig. 8 I have shown a projectile body adapted to be broken up into two fragments, in which a single coil of wire only would be needed.

The cylindrical shell of the projectile is so constructed that the nose and base caps B and C, see Fig. 1, will be separated from the cylindrical shell portion when the projectile explodes, leaving the fragments free to fly in opposite directions relative to each other, and to uncoil the coil wire connecting the two. Thus, when the projectile is exploded, as by a time fuse, the shell will be broken away from the nose and base caps and will be separated into pairs of fragments, each pair connected by a wire, and each pair, with the connecting wire, flying forward will cover a wide path. If either the fragments or the wire strike any part of the bracing or lighter parts of an aeroplane, the aeroplane will probably be disabled, and since the projectile is divided up into a number of parts the large danger zone resulting from the explosion will include quite a wide area; the fragments with the connecting wires forming, when the projectile is exploded in air, a metal mass somewhat like a spider's web, which, flying forward, will strike anything in its path.

The invention is especially applicable for use against aeroplanes, since it is necessary that the projectile shall be fired by a time fuse, but it also may be used against wire entanglements and other obstructions and against troops in the open. It may be also used for destroying growing crops, such as corn, wheat or the like.

While the time fuse is preferable to secure the most effective results, it is evident that a percussion fuse or a combination time and percussion fuse may also be used, but without as efficient results from the wire or chain part when the bursting is accomplished by the percussion fuse, or by the percussion portion of a combination fuse.

It will also be obvious that a chain may be substituted for wire to connect the opposite parts of the shell when desired; and also that the wire may be made up in bundles instead of coils, if desired.

While I have shown one way of attaching the wire to the body of the projectile any other suitable means for attaching the wires may be adapted if desired. Moreover when larger projectiles are used it may be desirable to break up the cylindrical shell into more than six fragments.

It will be obvious that other changes might be made in the herein described construction, and in the arrangement of parts which could be used without departing from the spirit of my invention.

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

1. A projectile of the character described, comprising a cylindrical shell provided with a series of weakening grooves symmetrically disposed, and a base and nose cap closing the ends of said shell, a series of wire coils each coil having its ends connected to opposite sides of said shell, and said wires being wound from their centers in reverse directions, and a bursting charge for said shell, substantially as described.

2. A projectile of the character described, comprising a cylindrical shell provided with a pair of weakening grooves oppositely disposed, and a base and nose cap closing the ends of said shell, a wire coil having its ends connected to opposite sides of said shell, and its body portion wound in reverse directions, a bursting charge for said shell, and a fuse for igniting said bursting charge, substantially as described.

3. A projectile of the character described, comprising a cylindrical shell provided with a series of weakening grooves symmetrically disposed, adapted to form oppositely disposed pairs of fragments when the projectile explodes, means for normally closing the ends of said shell, a series of wire coils mounted in said shell, each coil having its ends connected to opposite sides of said shell, and said wires being wound in reverse directions, a bursting charge for said shell, and a fuse for igniting said bursting charge, substantially as described.

4. A projectile of the character described, comprising a cylindrical shell provided with a series of weakening grooves symmetrically disposed, and a base and nose cap closing the ends of said shell, a series of wire coils each coil having its ends connected to opposite sides of said shell, and said wires being wound from their centers in reverse directions, the fore ends of said wires being led along grooves in the inner wall of said shell and engaging in notches provided in said shell, and a bursting charge for said shell, substantially as described.

5. A projectile of the character described,

comprising a cylindrical shell provided with a series of weakening grooves symmetrically disposed, adapted to form oppositely disposed pairs of fragments when the projectile explodes, means for normally closing the ends of said shell, a series of wire coils mounted in said shell, each coil having its ends connected to opposite sides of said shell, and said wires being wound in reverse directions, the fore ends of said wires being led along grooves in the inner wall of said shell and engaging in notches provided in said shell, a bursting charge for said shell, and a fuse for igniting said bursting charge, substantially as described.

In testimony whereof, I affix my signature.

OSCAR I. STRAUB.